

CHINHOYI UNIVERSITY OF TECHNOLOGY
SCHOOL OF HOSPITALITY AND TOURISM
DEPARTMENT OF HOSPITALITY AND TOURISM



**INDIGENOUS CULINARY CLAIMS AND MOLECULAR GASTRONOMY:
DEVELOPING A MODEL FOR CULINARY TOURISM IN ZIMBABWE**

BY

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HOSPITALITY AND TOURISM**

APPROVAL FORM

The undersigned certify that they have read and recommended to the Department of Hospitality and Tourism, School of Hospitality and Tourism, Chinhoyi University of Technology for acceptance: a thesis entitled, “Indigenous culinary claims and molecular gastronomy: Developing a model for culinary tourism in Zimbabwe”. Submitted by Margaret Nyarota, (C18132249M) in fulfillment of the requirements for the Doctor of Philosophy in Hospitality and Tourism Management.

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CANDIDATE DECLARATION

The thesis submitted as a requirement in fulfilment of the Degree of Doctor of Philosophy in Hospitality and Tourism Management in accordance with the university regulations.

This is the result of my own work and has entirely been composed by me, as required by academic conventions. I have acknowledged the work of others that I have referred to. This work has not been submitted to any other university than Chinhoyi University of Technology.

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Date : 24 July 2023

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ABSTRACT

Destinations around the globe have used their indigenous cuisines as a new tourism product whose uniqueness, authenticity and the general quality has given them a niche market for a competitive advantage. However, for other destinations, especially in developing countries, not much has been done. This was as a result of a lack of preservation of indigenous cuisines for that uniqueness and authenticity, and Zimbabwe is no exception. Furthermore, there is generally a lack of rational understanding of the phenomenon involved in the food preparation process which is key for the development of quality cuisines. The uniqueness of a country's cuisines is embedded in indigenous people's methods and procedures of food preparation and cooking (indigenous culinary claims). The aim of this study was to: assess the validity of Zimbabwe's indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism. The specific objectives of the study were as follows: 1) to establish the nature of culinary tourism in Zimbabwe 2) to assess the extent to which indigenous cuisines are being consumed by tourists in Zimbabwe. 3) to explore the available indigenous culinary claims in Zimbabwe 4) to conduct an assay of Zimbabwe's indigenous culinary claims through molecular gastronomy and 5) to develop a model for culinary tourism in Zimbabwe from the indigenous culinary claims and molecular gastronomy. The pragmatic philosophy was applicable and mixed methodology were used to cater for the multidisciplinary nature of the study. Similarly, a number of research designs were employed: survey, exploratory, descriptive, and experimental and observation. Data was collected from tourists, hospitality industry practitioners, indigenous elderly women, food science students, hospitality lecturers and canteen staff using structured and open-ended questionnaires, observation guides and in-depth interviews. These respondents were sampled through, purposive, convenient and snow balling methods. Thematic analysis was used for qualitative data, while the quantitative data used descriptive and non-parametric statistical methods from SPSS version 23. Tables, charts, graphs were used for quantitative data presentation, while qualitative data was presented in themes. The study findings indicated that culinary tourism in Zimbabwe was made up of a product which is compromising on the quality of indigenous cuisines in that: they were lacking in variety, the indigenous taste, authenticity and uniqueness and the prices were rather on the high side. Furthermore, the indigenous cuisines were still not a motivation for the choice of the destination. Findings on the indigenous culinary claims were based on the importance attached to the local foods, which was the reason for the indigenous people to attach that

value to food preparation and everything else that was related to their cuisines. Indigenous culinary claims focused on coming up with a specific quality of the product, therefore, all methods and procedures had explanations to why and how. Claims validation indicated that specific aspects of the cuisine were affected by the processes and procedures in its preparation and cooking as well as its service. The conclusion drawn from the study was that the indigenous culinary claims were valid, because the dishes prepared using the indigenous claims had better quality than those which did not follow the specification. The study findings can assist in informing policy on product development in the hospitality industry. On the practical side, the culinary claims and molecular gastronomy model can be used in developing indigenous cuisines and other culinary products for culinary tourism. This study, fulfils Education 5.0, when the model is used in the hospitality industry. This study recommends the exploration and validation of indigenous culinary claims to continue in other provinces of Zimbabwe, and the industry should start using the mode proposed by this study. The validation of indigenous culinary claims can be done using the qualitative method in other studies to complement the quantitative findings study of claims validation can use the qualitative method.

Key words: *Indigenous, culinary claims, culinary tourism, cuisine authenticity, molecular gastronomy*

DEDICATION

I dedicate this thesis to the Lord above, it is because of him that I managed to complete this work. Ebenezer my Faithfull God. I also dedicate this work to my whole family and friends for their support.

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LIST OF ABBREVIATIONS/ACRONYMS

CUT:	Chinhoyi University of Technology
DMO:	Destination Marketing Organisation
DNA:	Deoxyribo nucleic acid
FAO:	Food and Agriculture Organization
ICTA:	International culinary Tourism Association
MG:	Molecular gastronomy
MSG:	Monosodium glutamate
OECD:	Organisation for Economic Co-operation and Development.
PDO:	Protected Designation Origin
UK:	United Kingdom
UNESCO:	United Nations Educational Scientific and Cultural Organization.
UNWTO:	United Nations World Tourism Organisation
WHO:	World Health Organisation
WTO:	World Tourism Organisation
WTTC:	World Travel and Tourism Council
ZTA:	Zimbabwe Tourism Authority
HAZ:	Hospitality Association of Zimbabwe

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Food preparation is normally done without profound description of fundamentals guiding the process. In each community, various cooking methods are intertwined in cultural values unique to each community, even within the same country. The tradition of food preparation, which is based on the what, how and why of cooking procedures, is the defining variable which influences the type and character of cuisines both regionally and globally (Barbar & This, 2012; Du Rand, Booysen, & Atkison, 2016; Fooladi & Hopia, 2013). The processes and specifications guiding food preparation and cooking have remained the knowledge of a few indigenous women, especially in developing countries (Fooladi & Hopia, 2013). These specifications are variously called kitchen stories/culinary claims/narratives/precisions (Fooladi & Hopia, 2013). A study by Fooladi and Hopia (2013) indicated that these culinary claims have permeated the day-to-day cooking as the core of cuisines in spearheading culinary tourism around the world.

Tourist destinations around the globe have used traditional cuisines as a new tourism product whose uniqueness has always given a niche market for a competitive advantage (Walter, 2017). Such destinations include Spain, Italy, France and South Africa, among others. The uniqueness of a country's cuisines is embedded in indigenous peoples' ways, methods and procedures of food preparation and cooking, commonly referred as 'kitchen stories.' In this study the term 'indigenous culinary claims' is used. These indigenous culinary claims which are premised within tradition and cultural characteristics of communities have become the basis of indigenous ways of cooking and gastronomy in general (This & Kurt, 2013). They define the methods and materials used and hints and advice regarding the effectiveness of a preparation method (Vartiainen, Hopia, & Aksela, 2011). Through a methodical study of these kitchen stories, knowledge is developed, validated, documented and becomes the basis for cuisine development.

Globalisation has brought new trends in consumer science, with consumers demanding product information to guide their decision making. Molecular Gastronomy (MG) has also continued to gain momentum in the culinary tourism industry. Molecular gastronomy came in as a solution to the growing demand for product information. It deals with statements on food and cooking as one of its objectives, and is also the most recent trend in cooking (Burke et al 2020; Sariođlan, 2014). Molecular gastronomy, advocates for the

collection of indigenous culinary claims and scientific validation of their authenticity, thereby eliminating trial and error approaches in recipe formulation (Burke, 2016).

Most of Europe's top countries, with notable cases of France, Italy, Spain and Germany, have developed thriving cuisine-tourism businesses using their local foods in food related forms of tourism, through their traditional ways of preparing food (Burke, 2020). They have used their culinary claims and sciences like molecular cuisine and molecular gastronomy to develop unique cuisines. France, whose cuisines are popular globally, has since collected over 25 000 culinary claims which are still undergoing scientific verification (Du Rand et al., 2016). Also one of the first to inscribe its culinary heritage with UNESCO's List of Intangible Heritage (UNESCO, 2018). Once culinary claims are validated, they can be safely documented. However Zimbabwe's cuisines are losing their authenticity, hence there is every need to scientifically validate Zimbabwe's culinary claims, in order to come up with an authentic product, leading to promotion of culinary tourism in the country. The exclusivity in the study is that it brings a new dimension to culinary tourism to Africa, and specifically to Zimbabwe, since no similar study has been conducted.

Cuisines have been used in culinary tourism to showcase unique cultural heritages. Niche markets and destinations with worldwide repute are established in the tourism industry. Therefore, destinations are capitalising on culinary tourism to promote their cuisine as a unique product. Tourists visit places to experience the taste of a region's cuisine, given that every country's cuisines are unique, as preparation processes have specific nuances. The taste of a cuisine is now a key deciding factor in selecting a tour destination, therefore the term "culinary tourism" becomes relevant. This study brings to the fore the potential of carving of local cuisines in culinary tourism, using molecular gastronomy substantiations of indigenous culinary claims.

The background of the study, statement of the problem, research questions and objectives are also presented in this introductory chapter. It also covers the research conceptual framework, the study's significance, scope of the study and its organization. The key terms are defined, the methodology used is outlined and the chapter's conclusion is given.

1.2. Background of the study.

Culinary tourism has popularised many destinations based on their cuisine (UNWTO, 2017; Stierand, Dorfler and MacBryde 2014; UNWTO, 2013; UNWTO, 2012; Anderson, 2010). The development of cuisine in the developed world is often based on culinary claims from indigenous people (Stierand, Dörfler, & MacBryde, 2014), where local foods are used for unique and authentic cuisines. The use of recipes and culinary knowledge handed down inter-generationally, has resulted in the promotion of unique national cuisines globally, and the growth of culinary tourism as a whole (UNWTO, 2013; UNWTO, 2012; Anderson, 2010). To enhance authenticity and to satisfy the demand for the health and safety of food, the science of molecular gastronomy is used to validate recipes (Stierand, Dörfler, and MacBryde, 2014).

1.2.1. Indigenous culinary claims

Indigenous' refers to that which has been traditionally practiced through generations, by a group of people from the same region, community, their cultural heritage and traditional knowledge (Vartiainen, Aksela and Hopia, 2013). Culinary claims have been described as kitchen stories or culinary advises that have been passed along from generation to generation of chefs, mothers and cookbooks (Fooladi, 2009; This, 2009). Culinary knowledge is gained through the so called "kitchen stories" or culinary stories/precisions/narratives from indigenous people (Fooladi & Hopia, 2013; Vartiainen, Aksela & Hopia, 2013). The culinary claims relate to cooking specifications of a group of people from the same cultural background, with the term culinary being derived from the word 'culture.' Therefore, it is safe to say that indigenous culinary claims are knowledge about techniques and practices of food and cooking that have been passed along from generation to generation through, among others, chefs, mothers and cookbooks (Fooladi & Hopia 2013; Fooladi, 2009; Vartianen, Aksela & Hopia, 2011). The knowledge defines the uniqueness of a country or region's cuisine by specifying the "how" and "why" they prepare and cook food the way they do, making the taste, flavour and appeal different (Good, 2015).

In most parts of the world, including Zimbabwe, culinary claims have remained a secret to a few lucky to have the information passed to them from preceding generations. However, to date some of the information has been orally shared within the Zimbabwean populace. Oral tradition is generally viewed as mode of

evidence that is subject to lack of preservation and distortion (Moyo, et al, 2016). Therefore, there is need for this knowledge gap to be closed through documenting culinary claims.

1.2.2. Significance of indigenous culinary claims to cuisine development and cuisine authenticity

Food has been identified as the local culture of a place, region or state, and an important part of tourist brand and that makes it key in cuisine development (Skryetal. 2018). While gastronomy tourism refers to tasting of culinary specialties related to a region or dishes of the famous chefs, the characteristics of every part of a gastronomy speciality are: food preparation, choice of ingredients, presentation of dishes and how the food is consumed, according to tradition of an individual state (Skry et al., 2018). The characteristics are the variables which signify the local cuisine's uniqueness, through the claims, the food types and processing methods. The indigenous culinary claims define the specifications, and therefore the cuisine characteristic and uniqueness, which differentiate it from others (Kloss, 2013).

The success of any cuisine lies in the unique secrets passed over, as indigenous knowledge, to a few individuals through family generations. According to Gheorghe et al., (2013), indigenous culinary claims are becoming even more significant because of consumer trends, which are increasing demands for organic, ecological and traditional products. Nistoreanu (2014) made observations that traditional recipe and natural ingredients were the key in considerations in indigenous and traditional cuisine authenticity. These findings support the argument that traditional recipes can be tapped into for bringing in the uniqueness of a group of people's cooking methods.

The French are a prime example in using culinary claims in the development of high quality-cuisines (Nistoreanu, 2014). The culinary claims helped replicate flavours, which could have disappeared. Though their cuisine is very diverse, it has not lost its French touch. The use of indigenous culinary claims has become even more significant because consuming local and authentic food is becoming a global phenomenon, especially to tourist travellers who wishing to enjoy the taste of food within a local culture (Booyend and Atkinson, 2016). These indigenous claims have been the basis of such countrys' unique and authentic cuisines. However, for cultures and groups who have not publicly opened up or revealed their indigenous knowledge, have suffered low popularity and consequently have benefited less from food tourism (Booyend and Atkinson, 2016). Mnguni and Giampiccali (2015) opined that failure to pass traditional food knowledge could result in the distinct taste remained anonymous to the world customers.

There is need for such knowledge to be explored, documented and used in destination cuisines. Most of the developing countries are lagging behind in documenting such important knowledge.

1.2.3. Molecular gastronomy

The development and perfection of recipes has been done through trying different methods to come up with the most effective one. (Du rand et al., 2016; This, 1994; Kurt, 1994; McGee, 2007 & Barham 2010). However with the coming in of the newest branch of food science called molecular gastronomy, recipe development was done with informed decisions, making it easier than before (Cousins, O'Gorman, & Stierand, 2010). Molecular gastronomy (M.G) looks at gastronomy and molecules, which are the molecular aspects of gastronomy. Through M.G, there is an understanding of the science behind preparation of any dish in order to gain knowledge (Du Rand et al., 2016) that can help to produce healthier, more attractive and high quality cuisines. Gastronomy has been defined by Taar (2014) as a cuisine and it is a legacy established by cooks with its own special processes. Furthermore, gastronomy seeks to understand the physical characteristics of foods (such as quality) and what happens when food is consumed.

Molecular gastronomy makes gastronomy more meaningful by looking at the quality aspects of a cuisine, by taking cooking into the laboratory. In molecular gastronomy, the indigenous culinary claims are scientifically validated for authenticity. Not much has been done on the use of science in cooking by chefs especially in developing countries, yet cooking is a science in itself. Without the use of science in cooking, the process of cooking remains guess work and a form of trial and error, thus slowing the development of cuisines and culinary tourism in general. The first step of taking cooking into the laboratory is by collecting indigenous culinary claims, followed by validating them, which is what this study aims to do.

Though molecular gastronomy is still in its infancy, few countries like France, have collected their culinary claims for verification, showing that it is a known phenomena in other countries (Fooladi and Hopia, 2013). This has resulted in few publications on culinary claims, molecular gastronomy and claims validation. Fooladi and Hopia (2013, p. 15) concurs and has justified the paucity of studies in the area, "In molecular gastronomy most publications are focused on the phenomena rather than the real analysis." This justifies the need for studies, such as the extant one, to close this knowledge gap by systematically using the model to develop culinary tourism in Zimbabwe and other developed countries.

1.2.4. Significance of molecular gastronomy to cuisine development.

Molecular gastronomy is part of food and cuisine innovation (Barham, 2016; This, 2013). The prime purpose of molecular gastronomy is to scientifically substantiate culinary claims from indigenous people and chefs (Babars & This, 2012). Molecular gastronomy uses scientific methods of investigation for perfection of recipes (Lumat, 2013; This, 2009). The most critical stages in molecular gastronomy are the collection and documentation of culinary claims, followed by the validation of these claims for cuisine authenticity. The basis for cuisine development is knowledge of how food molecules react to specific processes during food preparation.

Food consumers in general demand genuine, authentic, and safe food health (Gheorghe et al., 2013). Culinary exposure to authentic cuisine gives tourists a holistic destination experience and wholesome gastronomy. For the tourist, a holistic experience whose motive to visit would be culinary exposure to an authentic cuisine, which gives a wholesome gastronomy. Health and wellness have become an important priority with an increase in the inclusion of indigenous products and a demand for quality as opposed to quantity (Kloss, 2013; Minihan, 2014). Therefore, it is against this background that the use of sciences like molecular gastronomy to validate culinary claims remains important for cuisine authenticity and further development. Africa, Zimbabwe included, has not used indigenous culinary claims and molecular gastronomy for their cuisines, which might have contributed to their cuisines being deemed inauthentic and very different from one another.

1.2.5. Culinary tourism

Culinary tourism was developed in 1998, as the art of experiencing other cultures through their food. (This, 2017) Culinary tourism is different from other forms of food tourism like gastronomy and gourmet, as it reveals the culture and history of a country (Du Rand, Booysen & Artkinson, 2016; Horns & Tsai, 2012; Sims, 2009). In culinary tourism, food is perceived through its history and culture. The cuisine attracts the tourist to appreciate the destination's history and culture through the country's local foods, dishes and cuisines, thereby providing a memorable experience after the visit (Moyo et al., 2016). Exploitation of

culinary or cuisine tourism using indigenous culinary claims and molecular gastronomy becomes significant as a way of boosting tourism in developing destinations like Zimbabwe.

1.2.6. Significance of indigenous culinary claims and molecular gastronomy to culinary tourism

Everyone needs food when visiting a place, but for some, food is motivation for travel and the choice for a specific destination (Batinic, 2017; Long, 2013). For culinary tourism to thrive the cuisine should be unique, enough, among other factors, motivate the tourist, develop tourism and destination economy in general. The use of indigenous culinary and molecular gastronomy claims has been and will continue to be significant in developing cuisines and improving existing ones. This has resulted in destinations gaining economically through food expenditures accounting for 25-35% of travel expenses (Stone, Soulard, Miguze & Wolf, 2018). Indigenous knowledge has been used in cuisines by the destinations, thereby coming up with authentic cuisines. Examples are the raw sea food, which is popular in France, mozzarella and pizza in Italy and Thailand is popular for its soup, which has a characteristic flavour, as well as their street foods. In the same scenario molecular gastronomy has revealed the secrets about the cuisine resulting in diversity of culinary products. In molecular gastronomy cuisines are documented and marketed via different methods, including word of mouth. The development of local cuisines through culinary education has also helped to promote tourism destinations as potential tourists can decide their destination with knowledge on the types of cuisines to expect. Spain is one of the countries which has become the talk of the food world through her cuisines. Evidence of a heritage based growth to the development of Spanish cuisine can be found in how a group of chefs stated “how their cuisines relied on recipes and culinary knowledge being handed down from one generation to the next” (Anderson, 2010, p. 48). This knowledge was verified and recorded and the same article adds, “Published endorsement helps develop cuisine as opposed to knowledge which continues to be handed down by word of mouth” (Anderson, 2010, p. 52). This offers strong justification for the need to document such information. It is therefore prudent for Zimbabwe’s indigenous cuisines to be developed in that direction in order to make indigenous cuisines competitive. This study marks the beginning of that journey by collecting the indigenous culinary claims, and then using the science of molecular gastronomy to validate them for cuisine authenticity.

With global trends showing higher demands for local, indigenous and unique cuisine experiences, literature has also shown that there are limited studies on how cuisines have been developed using culinary claims

and molecular gastronomy globally (Barber, 2012; Burke, 2016; This, 2013). Cuisines are becoming a key element in promoting tourist destinations and several researchers have confirmed this (Lopez, et, al, 2015). It is therefore vital to close this gap by using science to develop cuisines as the globe is also becoming scientific. The claims should be validated to bring out the uniqueness of a country's cuisines. The cuisine's uniqueness is what differentiates one from another, giving an appeal to the culinary tourist. It is high time developing destinations like Zimbabwe tap into their indigenous culinary claims and employ innovations like molecular gastronomy to help develop their culinary tourism.

1.2.7. Global culinary tourism

Tourism is one such industry which is growing fast, increasing destinations, building economies and creating employment (Boutsioukou, 2018; WTTC, 2018). Resultantly, many countries now view tourism as the main instrument for economic development with great potential to stimulate new economic activities. The utilisation of the available resources for its tourism market is the focus for this industry (Abel & Le Roux, 2017). Boutsioukou (2018) found out that outbound tourists spent US\$186.8 billion in the food service, which is the fourth largest spending after transportation, retail, and accommodation. This figure suggests the great potential that culinary tourism can have, though not everybody spending was a culinary tourist.

Literature has shown that only a few developed countries such France, Spain, U.K. and Sweden have used culinary claims and molecular gastronomy in developing their local cuisines. This has promoted culinary tourism development in the destinations through their cuisines which became a niche tourism product (Du Rand et al., 2016). Through molecular gastronomy, knowledge continues to be tried and tested for authenticity. The importance of culinary documentation was demonstrated by the French chefs as they have dominated the cuisine world. The French's language and uniforms have been used in food and beverages sector, bringing strong cultural and traditional influence on culinary tourism.

1.2.8. Culinary tourism in Africa

Culinary tourism in Africa is still relatively underdeveloped and hardly promoted (Jasińska, Charzyński, & Świtoniak, 2017). Furthermore, the cuisine has and still is largely dependent on oral culinary stories which are likely to be distorted further as it is handed down from family generations. (Cusack, 2000). In the same

study, Cusack (2000) further asserts that African cuisines have been heavily influenced by globalisation of culinary culture and colonisation. Therefore, in Africa traces of colonial influences on local cuisines can be found in most British colonies as most follow British cuisine styles, and the same is true for Zimbabwe (Brulotte & Starkman, 2014). Cusack (2000), further notes that despite these external influences on African cuisines, every region or nation has its own cuisine, which is unique due to its own foods and a rich culinary heritage from many ethnic groups, from many tribes. Zambia is an example from which a wide range of cuisine can be drawn from the 73 tribes to illuminate culinary tourism (Mahachi & Chatibura, 2016). South Africa is one of a few countries doing well in culinary tourism, where the Western Cape is known for wine trails and the Mpondoland culture village (Rogerson, 2015). Ethiopia is doing well in coffee tourism (Yun, 2014). All these examples are evidence of how culinary tourism can be expanded in Africa. The necessity and the potential for expanding African culinary tourism is mentioned, among others, by (Jasińska, Charzyński, and Świtoniak, (2017). Their studies analyse the advantages of introducing local cuisine to hotel restaurants in Kenya. Setswana cuisine was looked at by Mahachi and Chatibura (2016), considering it as an option for the diversification of tourism in Botswana. Therefore, culinary tourism can be of advantage to Africa, reducing unemployment and poverty of the region.

1.3. Statement of the problem

There is a threat to the lack of preservation of indigenous cuisines in Zimbabwe as a result of reliance on oral tradition to pass on culinary knowledge. Furthermore, there is also lack of rational understanding of the phenomenon involved in the food preparation process which is key to cuisine quality (Burke, 2016; This, 2013). In addition, the existing indigenous culinary knowledge has not been scientifically tested for its validity (Moyo et al., 2016; Ngulube, et al, 2015). Furthermore, few studies have been conducted on indigenous culinary claims and their validation through molecular gastronomy globally, in countries such as Italy, France and Finland. However, these few studies have only addressed the molecular gastronomy phenomena in general, and not the practical analysis of the cuisines (Burke et al., 2016). Empirical traditions require scientific study of the culinary process through molecular gastronomy in order to prevent their extinction. The preservation of indigenous cuisine and the rational understanding of the phenomenon involved in cuisine preparation have positive impacts on culinary tourism (Boutsoukou, 2018). In the same vein the lack of verification and documentation of these claims has a negative impact on the popularisation of indigenous cuisines and culinary tourism in Zimbabwe (Mkono, 2011). This study sought to assess the

validity of Zimbabwe's indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism using mixed methodology. The findings of this research will help tourism planners in packaging indigenous cuisine as a tourism product.

1.4. Research objective

This study will be guided by the following research objectives:

1.4.1 Main Objective

To assess the validity of Zimbabwe's indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism.

1.4.2. The Sub-Objectives

1. To establish the nature of culinary tourism in Zimbabwe.
2. To assess the extent to which indigenous cuisines are being consumed by tourists in Zimbabwe.
3. To explore the indigenous culinary claims in Zimbabwe.
4. To validate Zimbabwe's indigenous culinary claims through molecular gastronomy.
5. To develop a model for culinary tourism in Zimbabwe from the indigenous culinary claims and molecular gastronomy.

1.5. Research Questions

The study aims to answer the following research questions.

1.5.1 Main research questions

To what extent are Zimbabwean indigenous culinary claims valid?

1.5.2 The Sub-Questions

1. What is the nature of culinary tourism in Zimbabwe?
2. What is the extent of indigenous cuisines consumption by tourists in Zimbabwe?
3. Which are the indigenous culinary claims in Zimbabwe?
4. How valid are the Zimbabwe's Indigenous culinary claims as determined by molecular gastronomy test?
5. How can Zimbabwe develop its culinary tourism from indigenous culinary claims and molecular gastronomy?

Hypothesis were formulated from the results of objective 3 and the findings are in the other chapters

1.6. Study conceptual framework

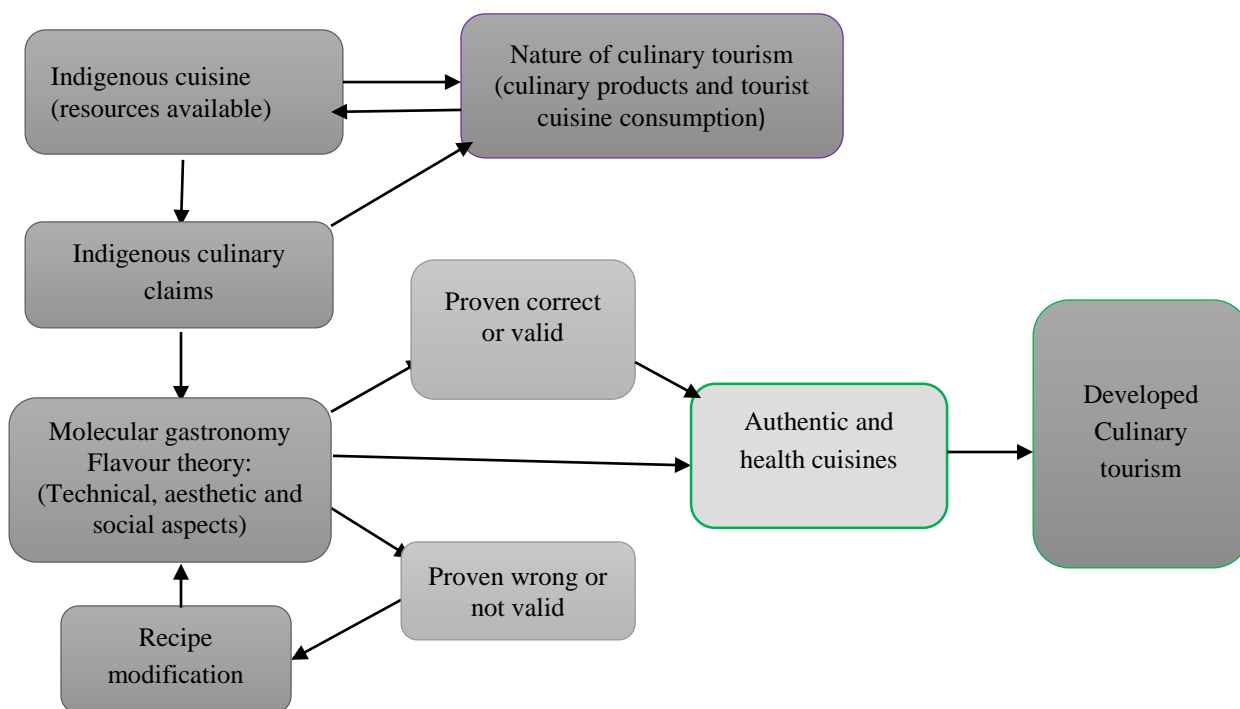


Figure 1.1 Conceptual framework. Source: Author's compilation

The study's first and second objectives were focused on the state of culinary tourism in Zimbabwe, thus, the nature of culinary tourism and extent of indigenous cuisine consumption by tourists. It is important to

understand the nature of culinary tourism in the process of developing the model. Therefore, the conceptual framework shows the nature of culinary tourism as the first concept. The nature of culinary tourism is what influences the culinary tourists' choice to visit a destination, as well as their extent of indigenous cuisine consumption. (Long 2018). Therefore, the study conceptual framework is showing that the nature of culinary tourism is determined by the culinary tourism products provided and this provision is possible through the relevant support systems.

The culinary tourism products are from the local foods and include the cuisines provided and the culinary tourism activities (Londono, 2015; Marc 2014). The support systems include the government and its support sectors like, tourism bodies, industry and other sectors and in particular, the agriculture sector. The government and its support sectors put the enabling systems in place, provide funding and other resources like infrastructure. The agriculture sector provides the foods which are used for the cuisines and other culinary products. Also important is the hospitality industry, which is responsible for the provision of cuisines and it is also involved in the culinary tourism activities. Moreover, the hospitality sector is part of the whole culinary tourism system. The framework shows two arrows one from the nature of culinary tourism to the indigenous culinary tourism and another one from the indigenous culinary tourism to the nature of culinary tourism. That is illustrating that the nature of culinary tourism is influenced by the indigenous culinary claims on one hand, and on the other hand, the indigenous culinary claims also influence the nature of culinary tourism. The culinary claims influence the nature of culinary tourism because the culinary products are specific to the methods and resources used, while the nature of culinary tourism influences the culinary claims as these should be tailored to meet the demands of the consumer (the tourist). By establishing the nature of culinary tourism in Zimbabwe in this study, it helped in identifying the gaps that should be filled by the study.

Next on the conceptual framework, are the indigenous culinary claims, which are determined by the resources available such as the local food and the other resources which are required for its production such as human resources, equipment and fuel, among others. The study looked at the specific ways and methods which were used to produce the cuisines in Zimbabwe. These ways and methods were also influenced by the resources (food, equipment, fuel and the human factor). The ways and methods and the resources are the independent variables which can be manipulated to develop a specific cuisine type. Similarly, the cuisine type is the depended variable as its quality depends on how the food, equipment and fuel are used.

Specific foods and ingredients are selected and prepared using specific methods. The equipment and fuel used should be suitable types and correctly used.

The human resource should have the knowledge and skills required for the product to be achieved. Similarly, this study used the community elderly women, who had the knowledge and skill (culinary claims) about the preparation and cooking of the food and all which surrounded its consumption (gastronomy). In culinary tourism culinary traditions are from the lived experiences of the indigenous people. (Burke, 2016; Long, 2013). The culinary claims are premised within culinary traditions of the lived experiences of a particular region and in particular the hints and advice about cooking (Walter, 2017). The indigenous peoples' knowledge and perceptions are going to be used in this study to understand the tradition through what the research is referring as: "indigenous culinary claims". In the indigenous culinary claims there are the cuisine characteristics, which bring out its uniqueness. The uniqueness is the differentiation point of one destination cuisine to another (Getz, 2015; Long, 2013). The culinary claims spell out everything required of a cuisine and the resultant product and in this study the indigenous methods are represented by the stand for 'the cook' and molecular gastronomy stands for the 'scientist' (see figure 2.2), for the framework which shows how the cook and scientist look at food. (Schenkelaars, et al., 2010). Therefore, the study will explore indigenous culinary claims as they have become significant in cuisine development. The line of argument for this study is that indigenous culinary claims bring out the distinctive and uniqueness of a cuisine.

Furthermore, the conceptual framework shows that the indigenous culinary claims influence molecular gastronomy (science of cooking). Food molecules react during the preparation and cooking process. Molecular gastronomy explains those reactions which occur during the cooking process and all that involves the consumption of food (Burke, 2016). An understanding of the characteristics of each of these components of food is key to understanding how to combine specific foods coming up with recipes and resultantly cuisines (Wijaya, Mehla & Wijaya, 2015). Resultantly, the cooking process is done with an informed decision, thus, preventing trial and error and for recipe perfection.

Molecular gastronomy also explains that cooking is also an art according to This (2013), therefore, the framework shows the technical, aesthetic and social aspects of a cuisine. (Mc Gee, 2013; Wijaya, Mehla & Wijaya, 2015). The technical aspects explain the cooking protocol, thus the food ingredients and how they are prepared and combined together using different equipment and fuel types. The aesthetic result from the technical and it spells out the sensory properties of food (organoleptic factors). These are important factors

in determining the quality and success of new and existing products. Similarly, the aesthetic factors are important because consumers response to the sensory properties of food (particularly appearance, flavour, aroma, taste and texture) (This 2013). Therefore, the relevance of the flavour theory in this study. The social part of molecular gastronomy involves the consumption experience. The environment in which food is taken, its set-up, what is used to eat the food, the people who do the service, those we share the food, including the table etiquette. All these influence the cuisine experience and its enjoyment. The experience theory and experiential theories's application to this study.

This study therefore, is advocating for the cook and the scientist to meet. They meet in the laboratory so that the cuisines are validated through test. Indigenous culinary claims should be validated scientifically to avoid trail and error and to produce authentic products. Molecular gastronomy was used in this study to validate the indigenous culinary claims to determine the quality factors of the indigenous cuisines. Those found valid will be used to formulate recipes, and used, while those not valid should be modified and send for test again for authentication. This explains that the validation process is continuous.

The conceptual framework shows the results of using the validation process as coming up with authentic and health cusines. These can be documented for future use in recipe books, journals and other form of safe keeping. Sustainability requires these indigenous culinary claims or perceptions to be documented since most of them are undocumented, therefore, another reason for the importance of validating them first (Fooladi & Hopia, 2013). More cuisine and culinary tourism activities, which showcase the destination's culture through cuisine experiences can be availed. With all these culinary tourism is developed to another level, until it is fully flaged. That explains the conceptual frame which was used for this study. Authentic cuisines market themselves and tourists who visit continue to spread the news.

1.7. Significance of the study

The study explored a relatively new area of study, which will be quite significant in the Zimbabwean context.

1.7.1 Knowledge contribution

The study will bring new knowledge in Zimbabwe's virgin culinary claims discipline through the collection of these claims, their documentation and the substantiation of the claims through molecular gastronomy. What has been passed orally from one generation to another regarding traditional indigenous Zimbabwean cuisines will for the first time be substantiated through molecular gastronomy, followed by proper documentation, with the cuisine aspects quality in place, such as health and calorific values. The research becomes relevant as part of a recent initiative, 'The Kitchen Stories Network', a network for those interested in the study of culinary precisions in science and education.

1.7.2 Methodological contribution

The uniqueness of this study was in the use of science in validating the food preparation and cooking process. The methodology will enrich the tourism industry as the mixed methods approach in research where issues are examined holistically. New knowledge is developed in cuisines for the benefit of the country, and others who may want to tap the knowledge. The study will be of great significance as it will be the first to collect data on traditional indigenous culinary claims in Zimbabwe. After the collection, the knowledge on claims will be substantiated scientifically to determine myths and truth which will be through accepting or rejecting the hypothesis, followed by proper documentation in a format that will enable it to be professionally shared for the development of local cuisines. The claims will help attract tourists to Zimbabwe.

1.7.3. Practical significance

The Zimbabwe's indigenous cuisine product lacks the authenticity and uniqueness which attracts tourists to the destination. The findings can also be used to come up with a model, which can be used to guide the development of culinary tourism in Zimbabwe. The model will bring a new dimension to Zimbabwe's culinary tourism and other destinations which may want to boost their culinary tourism. Domestic, regional and international tourists will be courted through unique and authentic local cuisines.

1.8. The scope of study

The study focused on the collection of indigenous culinary claims in Zimbabwe and validating them using molecular gastronomy. The findings assisted in developing a model for culinary tourism in Zimbabwe. The research borrowed from the following five goals of molecular gastronomy; 1. To collect and investigate Old wives' tales about cooking. 2. To model and scrutinise existing recipes. 3. To introduce new tools, products and methods of cooking. 4. To invent new dishes using knowledge from the first 3 goals. 5. To use the appeal of food to promote science (Mc Gee, 2003). For this study the first and second goals were used, thus, to collect and investigate the elderly women's stories about cooking and the second goal is to model and scrutinise existing recipes. In this study the two goal number one was used because it calls for the collection of culinary claims as well as validate them, while goal number is also about validating the recipes. Therefore the study went on to collect indigenous culinary stories (claims) from two provinces of Zimbabwe, Mashonaland West and Masvingo, which represent the ten provinces of Zimbabwe.

The study was premised on the assumptions that elderly women over 65 years had the knowledge on the indigenous ways and methods of preparing authentic cuisines. The laboratory tests of claims were done at Chinhoyi University of Technology. The study was done in five years. Mixed methodology approach was used because of the types of data which was both qualitative and quantitative in nature. The exploration of culinary claims required qualitative data, while the validation of the claims was quantitative and scientific in nature.

1.9. Definition of terms

1.9.1. Indigenous culinary claims

The term indigenous culinary claims in this study is defined as the regional indigenous knowledge traditionally used to prepare and cook food, and everything else surrounding its consumption. (Vartiainen, Aksela & Hopia, 2011; Fooladi, 2009). Other terms used for culinary claims include: culinary precisions, cooking rules or advice, cooking know how, old wives' tales, kitchen stories, 'adages' or 'maxims.'

1.9.2. Molecular gastronomy

Molecular gastronomy can be summarised as the science of flavour and tasting (Kloss, 2013), where science is used to study the cooking process, which explores all the aspects of food, encompassing the technical (scientific), artistic (aesthetic) and social (those who consume the food) (Burke, 2016; McGee, 2013; Saptariana, 2013; This & Kelly, 2016; This, 2013; This & Rutledge, 2009). The aim of molecular gastronomy is to find perfection in all recipes to come up with a quality product.

1.9.3 Culinary tourism

Culinary tourism, unlike other food related forms of tourism, looks at a people's culture in relation to their food and eating. A summarised definition relates to a tourism experience in which one experiences cultures other than one's own, by learning, appreciating or consuming branded local culinary resources (Du Rand, et al., 2016; Minihan, 2014; Wolf, 2008), by travelling in search of and enjoying prepared food and drink for a unique and memorable experiences.

1.10 Organisation of study

The study was organised in eight chapters as follows.

1.10.1 Chapter 1

The chapter is the introductory chapter, where the background of study is given, the problem which motivated the study and the objectives are articulated. The conceptual framework which shows the relationship between the research variables and the justification of the study are given. Lastly the chapter explains the scope of the study.

1.10.2 Chapter 2

This chapter explores the research problem from other studies carried out in the areas of indigenous culinary claims, molecular gastronomy and culinary tourism globally, thus identifying gaps in the study area. The literature serves as primary data. The concepts are clarified and the parameters for data gathering are identified.

1.10.3 Chapter 3

Chapter three outlines the study methods, including the research philosophy, study design, population, and sample and sampling techniques. Research instruments, data collecting procedures, data analysis and the presentation methods are also elaborated. Validity and reliability aspects are outlined for data authenticity. Ethical considerations are also outlined in this chapter.

1.10.4 Chapter 4

Chapter four presents the study findings. The data is presented, analysed and interpreted to answer the research questions. The data is presented after synthesis of the data to get meaning from it and to meet set research objectives. Specifically, this chapter will cover findings for objectives one and two; the nature of culinary tourism in Zimbabwe and the extent of indigenous cuisine consumption by tourists in Zimbabwe. The two objectives sought to establish the status quo of culinary tourism in Zimbabwe.

1.10.5 Chapter 5

The presentation and discussion of results on the indigenous culinary claims is going to be covered in chapter five.

1.10.6 Chapter 6

The presentations and discussion of findings on objective 4: the assaying of indigenous culinary claims will be covered in this chapter.

1.10.7 Chapter 7

The findings given in chapter four are discussed in this chapter. The outcome versus what was assumed or what other researchers found out is discussed to come up with the conclusion to the study. The model developed is presented in this chapter.

1.0.8 Chapter 8

The conclusions based on the objectives are outlined. The implications for theory, policy and practice and implications for methodology are given. Implications of the research to the existing body of knowledge are presented. The gaps noted from the study are outlined and areas for further research are highlighted.

1.11 Conclusion

The chapter introduced the study on the indigenous culinary claims and molecular to develop a model for culinary tourism in Zimbabwe to show the background of the problem in question. The aims and the objectives were highlighted so show the focus and boundaries of the study. The research's significance was given to justify the need for the time and resources spend on it. Boundaries of research were spelt out and the methodologies to be used. The next chapter is going to cover the related literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Knowledge about cooking is traditionally shared orally and handed down through generations in written form or as a recipe (Fooladi & Hopia, 2013). The specifications or instructions in the recipe are the shared common knowledge of societies about the techniques or practices of food and cooking. Many of these specifications are rooted in tradition This (2013), while others are more recent and some are rooted in long experience of kitchen professionals or homemade cooks and some originate from science. The same research advocates that the claims provide a unique arena between science and society. The claims describe the technical or procedural information present in a recipe (oral or written), which provides added value in terms of improved quality and greater chance of a successful product (Barbar & This, 2012). Using local resources and foods as the traditional ingredients to make traditional food/cuisine has made destinations more competitive globally.

With the increase in tourist volumes and given their more discerning nature, tourist destinations are increasingly compelled to invest in the development of local cuisine (Mnguni & Giampiccoli, 2015). More innovative and adventurous chefs are blending science with cooking by using molecular gastronomy. The use of culinary claims and molecular gastronomy has played a significant role in cuisine development globally. Molecular gastronomy has advocated for the sharing of this traditional knowledge to the developing of new skills in cooking. Furthermore, sharing of knowledge is so important for maintaining ethnic food traditions' role in intercultural exchange. There is lack of sharing of this knowledge resulting in very few publications on culinary claims (Benny, 2012). The same author concedes, however, that publications available mostly explain the phenomenon rather than the analysis of claims or precisions.

Different authors' views on the indigenous culinary claims and molecular gastronomy and their relationship to culinary tourism were considered in this review. Literature conceptualised and clarified terms used in the research by reviewing definitions by various authors. Reviewing the literature assisted in revealing gaps in knowledge, therefore, justifying the need for this study. Specifically, the chapter reviewed literature on the conceptualisation of terms, indigenous culinary claims, molecular gastronomy and culinary tourism and the literature on the nature of culinary tourism, the extent to which indigenous cuisines are consumed by

tourists, indigenous culinary claims and molecular gastronomy in cuisine development. The theoretical basis of the study was also identified in the chapter.

2.2 Understanding of key terms

2.2.1 Conceptualisation of indigenous culinary claims

The term indigenous is confused with the term traditional, and for that reason they have been used interchangeably by many authors, hence the same in this study. To avoid that confusion Mnguni and Giampiccoli (2015) have combined the meaning of the two terms: indigenous and traditional food, by defining them as: as “vegetables, fruits, nuts and grains that are native to a region and-or that are consumed linked to culture and heritage”. This definition has been viewed as more general and tourism related (Mnguni & Giampiccoli, 2015). According to Reinders, Banovic and Guerrero (2019) traditional foods are defined as food products in which:

- (1) the key production steps are performed in a certain area at national, regional or local level,
- (2) are authentic in their recipe (mix of ingredients), origin of raw material, and/or production process,
- (3) are commercially available for about 50 years, and
- (4) are part of the gastronomic heritage.

Furthermore, indigenous foods refer to plant and animal-based foods that exist naturally, produced in specific locations and are consumed as part of traditional diets. According to Rampa, Lammers, Linnemann, Schoustra and Danielle de Winter (2020) in most regions these are acceptable and used by rural communities through customs and traditions. As a result, indigenous becomes part of culture, calling for the protection and development of the cultural heritage of a region (Mnguni & Giampiccoli, 2015). Since these foods are from a region and produced in a specific way, they are also prepared, cooked, and served giving them their ethnic distinctiveness. Resultantly, the specific results of a cuisine are different from others and therefore unique and termed claims to describe specifications about cooking and food preparation.

Since these claims relate to the cooking process, they are therefore “culinary.” The fact that they have been traditionally practiced by generations makes them “indigenous.” Fooladi (2009) has written widely about

indigenous culinary claims and refers to statements about cooking as “culinary precisions.” He also describes them as “old wives’ tales,” “culinary proverbs,” “cooking rules/advice”, “know-how” “adages” or “maxims.” Fooladi’s definition touches on all terms or words that can be used to describe these statements. Vartiainen, Aksela & Hopia (2013) call these statements “kitchen stories” that contain “culinary advices” passed along from generation to generation by chefs, mothers and cookbooks. Fooladi (2013) also looks at “culinary precisions” as rules one has learnt through tradition, or what cookbooks (or celebrity chefs) tell one to do, when dealing with food.

This (2021) gave so many alternative terms which speak about these statements, which clarifies the meaning. The term “kitchen stories” may be confusing as kitchen stories can be any type of stories which can be a source of entertainment and socialisation traditionally told in the kitchen, and not necessarily on food and cooking (Vartiainen at al., 2011). According to tradition proverbs may not refer to those on food, so making culinary proverbs specific to food and the cooking process may not be confusing. This study will use the term “indigenous culinary claims” as the regional indigenous knowledge traditionally or culinary traditions practiced by generations on the ways and methods of preparing and cooking of their food, how it is served, when and where the food is served and all that makes it ready for consumption (Fooladi, 2009; Vartiainen, Aksela & Hopia, 2011). With reference to foods, indigenous, traditional and local foods were used interchangeably.

2.2.2 Conceptualisation of Molecular Gastronomy

The term molecular gastronomy was formulated to limit the scope of new scientific enterprise on gastronomy (Barham et al., 2010; Burke et al., 2016; Cousin, 2010). It has a special focus which has not been looked into by other sciences. The phenomenon has two words: molecular and gastronomy. Food is referred to as ‘molecular’ because it is made up of substances, which are molecular in nature. However, these molecules are quite reactive during food preparation resulting in various changes in the process. These changes result in the different tastes experienced when food is eaten. This study will explain these changes and tastes through the flavour theory, which is the overarching theory for this research.

On the other hand, the term ‘gastronomy’ is of Greek origin from the word gaster (stomach) and nomia (law) (Coporaso & Formisano, 2016; Salvin, 2015). According to Cousin (2010) gastronomy is the reasoned knowledge of all that relates to man feeding himself while, This (2006, p. 1062) explains it as “knowledge of what concerns man’s nourishment.” Many researches explain gastronomy as the set of

techniques and culinary arts to prepare good food (Batinic, 2017; Coporaso & Formisano, 2016; Drpic & Vukman, 2014). This perspective shows that gastronomy includes the preparation of food, though This (2006) and Cousin (2006) have definitions of gastronomy which omit food preparation. This (2006; 2007) has differentiated gastronomy from food preparation indicating the preparation of food as part of cooking. The set of techniques and culinary art are part of the cooking process, making the definition quite applicable. An analysis of the concept 'gastronomy' shows that it relates to feeding and nourishment. Cooking is its thrust, through the set of techniques and culinary arts all which determine the nourishment and goodness of the cuisine. Food should be prepared or cooked first before it is consumed, if it is to provide the nutrients which the body requires. McGee (2004) supports this, further stating that man is able to survive longer by eating, and not only eating, but eating good food.

In addition, gastronomy involves studying the relationship between food and culture (Okumus & Getin, 2018). Further to that Batinic (2017) submits gastronomy as including the cooking skill of preparing good meals, involving the culture of selecting food and cooking craftsmanship. An analysis of all the definitions above constellates gastronomy as linking food and culture, how the food is prepared and how it is eaten. A definition by Salvin (2015, p. 23) which states that "gastronomy is research on good eating and drinking, which converts the culture of eating into an art" can be used to synthesise all the given definitions. Therefore, it is reflective of how the art of cooking and eating is embedded in culture. From what has been revealed in this review, gastronomy has its basis on culture, and as cultures differ so too does gastronomy. Consequently, gastronomy is different and unique from one group to another. Culture has played a major role in moulding what people eat and the nature in which it is consumed. In addition, the culture and tradition also determine what food is or is not, as the sayings "food is culture" and "we are what we eat" attest (Gabaccia, 1998). "We are what we eat" is preaching about how the body responds to the food molecules consumed at a particular time and place. The indigenous culinary claims show the art and science of a specific culture. Food can therefore be used to differentiate one culture from another. In tourism cuisine tasting is way of experiencing a people's culture.

The molecular aspect, as indicated earlier, looks at how food substances "the molecules" react during the whole process of food preparation "gastronomy." In molecular gastronomy the reactive groups in food 'the molecules' are studied throughout the food preparation process (Saptariana, 2013; This, 2013). The science aspect of food preparation is looked into in molecular gastronomy, while gastronomy alone is looking more into food, art and culture. This was supported by Yek, Grace and Struwe (2008) who contend that

gastronomy lies in an area that is not strictly science, but one where the vein of the cultural art runs squarely across. In this understanding the science aspect is brought in by the molecular aspect. Molecular gastronomy then becomes the science of food and cooking. This study will define molecular gastronomy as; the scientific discipline dedicated to the exploration and investigation of culinary mechanisms of phenomena “molecular” which are related to the sensory perception of food “gastronomy” (Traynor, 2013; Snitkjær, 2010). An integrative approach to food, cooking and cuisine is adopted by this study. The study looks into the science of cooking “molecular gastronomy” and the art and culture of cooking “gastronomy” which will together produce a product which will satisfy consumers. This context of the gastronomy in art and culture are the culinary traditions, which will be explained by the indigenous culinary claims.

2.2.3 Conceptualisation of culinary tourism

While food tourism is the broad term for all food related forms of tourism, culinary tourism is linked to the cultural history of a region (Almeida Garrod, 2017; Okumus & Getin, 2018). The International Culinary Tourism Association (ICTA), as cited in Upilhyay and Sharma, (2014) contends that culinary tourism is the pursuit of unique and memorable eating and drinking experiences. The definition differentiates culinary from gastronomic tourism, as culinary goes a step forward linking to the food history of a culture, while gastronomy is just the food experience. Therefore the term culinary was derived from the word “culture” (Minihan et al., 2014). According to Wolf (2008, p. 289) culinary tourism is “any tourism experience in which one learns about, appreciates, or consumes branded local culinary resources.” The same author further states that culinary tourism “is about food; exploring and discovering culture and history through food and food related activities in the creation of memorable (Wolf, 2008, p. 64). According to Ignatov and Smith (2006) culinary tourism is said to exist in the context of agricultural tourism (includes farm holidays, visits to markets and fruit orchards). In this context the experience can be through observation and study of food production from agriculture to cooking schools. Above all, in culinary tourism there is search for high quality traditional dining experiences with the local people. The local people provide a real culinary experience because they provide the indigenous knowledge. This knowledge can be readily availed through documenting. Wolf’s definition includes the branding aspect which most authors omit. This is because the same food may be differentiated by branding it, bringing the uniqueness of different regional or destination cuisines (Sammells, 2019).

According to Du Rand et al (2016), food is engraved in the culture of a group of people and cuisine is local food culture, which reflects the way in which a particular social group thinks about food and their cooking style. Through the study of indigenous culinary claims and their culinary history, knowledge about the food of a cultural group and their cooking style is acquired. According to the UNWTO (2018) culinary tourism “... includes tourists and visitors who plan their trips partially or totally in order to taste the cuisine of the place or to carry out activities related to gastronomy” (WTTC, 2017: 7). Though there is a variation in these definitions, a common aspect is that culinary tourism refers not just to dining out when one travels, but to a wide range of culinary travel experiences that highlight food, drink or dishes unique to the destination and also highlighting some other aspects of local culture. In summary, culinary tourism involves international sharing of eating habits of different races and cultures, exploring the globe (Long, 2014; Wolf, 2001). The next section will look into the literature on the nature of culinary tourism, which covers the first objective of the study.

2.3 Nature of culinary tourism.

2.3.1 History of culinary tourism

In the year 1998 Dr. Lucy Long developed culinary tourism as an art of experiencing cultures other than one’s own through food (UNWTO, 2018). From Long’s view, a better experience of cultures was by exploring the treasures in an alien kitchen. An association called the ‘International Culinary Association’ was created, with Erik Wolf, the president, launched a paper in culinary tourism in 2001. In the year 2012 The World Travel Association stopped using the term “Culinary Tourism” as it was viewed elitist. Other terms then evolved, to include the term gastronomy, which was popularly used in Europe. The use of the original term “food tourism” was abandoned as it was deemed very basic and lacking the cultural niche (Wijaya, 2014). On the other hand, while the word gastronomy was perceived as reflecting culinary culture and tradition, it did not spell out the preparation aspect of food. The fact that both the terms gastronomy and culinary include cultural aspects, meant, they could can be used interchangeably in most cases. With that background, culinary tourism authors have highlighted the big role played by food in the process of discovering a destination and in particular its culture (Kazembe, 2018; UNWTO, 2017; Wijaya, 2014). In essence culinary tourism aims at showcasing the culinary traditions of a destination. As a result, a specific cuisine would represent the country of origin. Cuisines would be named from the name of the country and

in the language of that country. Within a country regional cuisines represent the various ethnic groups. The visit by a tourist was a desire to sample typical local delicacies. With time gastronomy shifted into excitement seeking and emphasis was on sampling exotic cuisines and wine as an exploration of the country. Consequently, this strong crave to sample foreign cuisine just out of curiosity, paved the way for culinary tourism (Wijaya, 2016). History shows that cuisine and wine are prime attractions which make a destination a famous crowd puller. The slant towards culinary tourism gradually became common since then, and destinations have been defined by their gastronomic cuisines. Resultantly, travellers have made these places the destinations of their choice to visit (Long, 2014; Silkes et al., 2013; Wijaya et al., 2013). Since inception of this tourism typology, academics and chefs continue to study the phenomenon and some of the research is shown in Table 2.1.

2.3.2 The development of culinary tourism research

Culinary tourism, having developed from food tourism, had its first research discussing the relationship between food and tourism in the year 1983 (Belisle, 1983). The terms ‘food tourism’, ‘culinary tourism’ and ‘gastronomy tourism’ began to appear in tourism literature in the year 1990. This resulted in an edited book titled ‘*Culinary Tourism*’ which was published in 1998 (Long, 2004). The primary concern was to link local food to tourism, resulting in a conference held in Cyprus in November 2000. The aim of the conference was to discuss the relationship between local food and tourism (Cohen & Avieli, 2004). Scholars contributed to understanding of the importance of food for tourists and the destinations visited. In summary food was said to be an important attraction for tourists and destinations, resulting in destination competitiveness.

Although culinary tourism is an under researched phenomenon, (Ottenbacher & Harrington, 2013; Ottenbachera et al., 2016), increased attention was given in cultural tourism by tourism organisations. The United Nations World Tourism organisation hosted its fifth World Forum on Gastronomy tourism in Spain in 2019 (Black, Okumus & Tasci, 2020). Attention also being facilitated by television programmes, magazines and online platforms. There are programs such as: Global Chefs, an international programme for chefs, in which top chefs’ travel to other countries to share native cuisines with clients and guests. In these programmes, chefs are exposed to culinary stories and the adventures they go through help them lead their kitchens with expertise and passion. Such platforms have also increased tourist confidence in trying new foods and tastes. These initiatives are evidence of the seriousness attached to cuisines globally. This is

evidence that culinary stories have the answers to destination cuisines. This study adopted this stance so that cuisines in Zimbabwe begin to serve their purpose in the tourism of the destination. Table 2.1 shows some of the research in culinary tourism between 1983 and 2019. The next section will delve into the global trends in culinary tourism.

Table: 2.1 Researches in culinary tourism. Source: Author’s compilations.

Author	Title	Major Findings
Belisle (1983 and 1984)	Relationship between food and tourism.	Food is important for tourists and destinations. Food is an attraction for tourists and results in destination competitiveness.
Cohen and Avieli (2004)	Importance and necessity of food tourism and travel destinations.	Food is of significant attraction for tourists and help to enrich the travel experience.
Kim, Eves, and Scarles, 2009	Motivations underlying the consumption of local food	The study established an in-depth understanding of consumption of local food in destinations.
Sims, R. (2009).	Food, place and authenticity: local food and the sustainable tourism experience.	Tourists’ motivation and satisfaction of culinary event.
Mak, Lumbers, Eves, et al (2012)	Tourists eating behaviour and food consumption	Behaviours of food tourist customers.
Getz and Robinson, 2014	“Foodies” and Their Travel Preferences	Foodies are highly involved with food, they think of themselves as gourmets. Experiences include: consumption of authentic cuisine, learning about food/beverages and gastronomic tradition and socializing
Kline et al.: 2015	Exploring Foodie Segmentation.	Foodies looked for culturally-authentic food, educational experiences regarding heritage foods or food traditions, and opportunities to socialize through food experiences when they travel.

Long (2018)	Culinary Tourism: Negotiating Exoticness, Negotiating Power.	Culinary tourism can move us beyond deeper knowledge about food cultures. It can take a universal instinct curiosity re-channel it, and use it to lead the consumer into a deeper understanding of the culture behind that food, into the logic of the Other.
Zhang et al., (2019)	Authenticity, Quality, and Loyalty: Local Food and Sustainable Tourism Experience.	Authenticity is a key precursor to the quality satisfaction loyalty framework of food tourism.

Source: Authors' compilation

2.3.3 Global Trends in culinary tourism

Culinary tourism aims to come up with cuisine from local foods. Consequently, the nature of different cuisines is that they are intertwined with cultures, traditions, passions and religions of people living in different countries and continents (WTO, 2012). The globe has become more competitive in the provision of diverse products and that has affected customers' decision to visit and purchase products (Uygun et al., 2019). The diversity is determined by the food and processing resources available, not forgetting the knowledge and expertise available. During the visit, tourists want to experience authentic culinary traditions, which inspire them to have passion and love for food (Global Culinary Annual Report, 2018).

The rapid growth of tourism has been necessitated by developments such as the removal of borders, the development of transport systems and information technology (Gheorgie et al., 2014). Subsequently, tourism based on gastronomy became one of the latest trends globally (Boutsioukou, 2018; Lopez-Guzman et al., 2014). Although it can be argued that culinary tourism is not a new travel activity, it has seen significant growth within the tourism industry over the past few years (Ottenbacher & Robert, 2013). In particular culinary tourism is growing and becoming more popular globally by the day (Boutsioukou, 2018). Owing to its growth potential, culinary tourism has since become a new strategic sector contributing to the generation of wealth and employment for the entire value chain system (Ian, 2016; Komariah, Razzaq, Nugraheni, Lastariwati & Mahfud, 2020; Sims, 2009; Tan et al., 2019). Furthermore, with the coming in of other related forms of tourism like cultural, agro and organic, food tourism is part and parcel of those forms of tourism, resulting in its significant growth.

According to the World Tourism Organisation reports (UNWTO, 2018; UNWTO, 2017), culinary tourism not only recently gained rising attention, but has become one of the most vibrant and innovative segments in tourism (UNWTO, 2012). It is evident that destinations who have managed to develop their products well have attracted large numbers of tourists. Many studies done in destinations with vibrant culinary tourism showed that generally tourists spend one third of their holiday budget on food (Stone et al., 2018; Tsai, 2016; Wallu, 2016). Other scholars insist these tourists are not willing to reduce their budget on food (Everest, 2016; Mao, 2015; Stone et al., 2018; Tsai, 2016).

Apart from this, such visitors stay longer at tourist destinations, while spending more on local products. They resultantly spend more on local products, which creates sustainability (Lai, Khoo-Lattimore & Wang, 2017; Roig, 2018; UNWTO, 2018; UNWTO, 2017). Sustainability is an important phenomenon in the utilisation of local and indigenous foods.

Long (2018) adds that travelling motivated by food and food products has displayed its significant power and force in the global economy. Statistics reveal that for 2016, 88.2% considered food as significant in selection of a destination for vacation. These high percentages have resulted in contributions to global economy being at \$2.3 trillion (WTTO, 2017). American leisure travellers participating in food travel activities were over 90% of this total (Stone et al, 2016 and 2017).

In the region, Africa is still not well discovered by tourists. Few come to Africa because natural resources and wild life have been the only attraction. According to the World Bank, the countries visited most include Morocco, South Africa, Tunisia, Algeria, Egypt and Algeria. For the year 2014 statistics of visits were 10.283 million, 9.628 million, 9.549 million, 6.069 million, and 2.301 million respectively (World Bank, 2016). Leading the way are Arabic countries in the Northern part of Africa: Egypt, Tunisia and Morocco, followed by South Africa (World Bank, 2016). The reason for these destinations having high arrivals is related to their nearness to Europe, where most tourists come from. However, for South Africa, which is far from Europe, its tourism industry has utilised the local food as a tourism product making their destination attractive.

Most African countries have very low numbers of tourist inflows. In Zimbabwe inflows are similarly low, though visitors remain attracted to Victoria Falls and wild life as Jasinska, Charzynski and Switoniak, (2017: 104), attest, “Zimbabwe is rich in traditions, history, art and cuisine, but is still suffering from disinvestment, high poverty rates and deterioration in provision of other social services.” Above all,

Zimbabwe Tourism Authority (ZTA) maintain Zimbabwe is blessed with abundance of resources which can be utilised in tourism that can stimulate economic growth and alleviate poverty (Zhou, 2018). Though many factors have held back tourism in Zimbabwe, and other African countries, discovering the indigenous cuisine can be a viable tourism product which can attract large numbers of tourists. This is possible from the global perspective and trends in recent study findings show that there is a critical relationship between tourism and gastronomy (Bessiere, 1998; Henderson, 2009; Long, 2004; Luchprasith and Macleod, 2018; UNWTO, 2017). When culinary tourism is packaged with cultural tourism and agro tourism it gives a destination its unique food.

Literature is supporting that all destinations have their unique local foods, which are attracting as more and more people to travel and visit tourism destinations to taste unique and authentic culinary products; Tourists around the world are increasingly motivated to try different kinds of foods, in particular the ethnic and traditional foods of the destination. They also learn to appreciate and accept differences in food culture (Santikul et al., 2019). Furthermore, tourists can also find cuisines from their home countries when they visit some destinations. For example, Zimbabwe hosts Chinese, Portuguese and Greek restaurants, which can provide for tourists who seek cuisines they are familiar with.

Culinary tourism calls for creation of distinctive atmospheres that are important for an unforgettable travel experience by connecting the tourist with local culture, landscape, and food (Daries et al., 2018). In addition, tourism destinations can create a strong image by exploiting unique culinary features and cultural assets (Jasinska, et al., 2017). In that respect many destinations have resorted to working towards making their cuisines an attraction for large numbers of tourists to visit them. At the same time, culinary experience has grown into a viable part of every journey (Jasinska, et al., 2017). According to Daries et. al (2018) and Ottenbachera et. al (2016) in new tourism trends, the cuisine quality is becoming increasingly relevant in the process of choosing a destination. Therefore, destination image frameworks should continue to work towards producing the product on demand by tourists so that their destination is competitive. Similarly, Zimbabwe has a rich culinary heritage from which products for culinary tourism can be availed. However, not much has been done to illuminate these products, the gap which this study also seeks to fill.

Global competitiveness has compelled food service businesses like hotels to provide products which are more competitive and sustainable. Culinary tourism uses local foods in their authentic (original) nature which is the answer to the quality of a cuisine which satisfies the tourist. Local, regional and global cuisine emanates from locality, traditional or indigenous raw materials because such products are unique to a

geographical place. Resultantly, in culinary tourism, food and cuisines are specific to an area globally. On the other hand, aspects such as rationality, travel and trade have influenced the authenticity of cuisines to a certain extent (Ottenbacher & Harrington, 2013). It is up to the destination to guard against their cuisine to maintain its authenticity and uniqueness. This background makes part of this study focus on the Zimbabwe cuisine, where it was found necessary to explore indigenous culinary claims, for the cuisine authenticity and its uniqueness. The claims provide for that which other destinations cannot give, thus marketing the destination. This will differentiate Zimbabwe from other destinations, attracting tourists to visit for the memorable experience. By maintaining cuisine uniqueness, a destination increases its market share as it is specific to them (Uygur et al, 2019). The increase in exposure to diverse national and regional cuisines has resulted in an appreciation of different cultures in the world, thus globalising food cultures. The key to a competitive product is quality. Specifically, tourists travel motivations have included a total feeling of the environment during the visit and food is one of them, not only food, but unique and tasty food. They want to experience the “other.” The relationship between food and tourism is therefore going to be reviewed to get a better understanding of that experience of the “other.”

2.3.4 Relationship between food and tourism

Food is a “hot” topic today and it is discussed on prime-time television, in the popular press and on the radio (Ottenbacher & Harrington, 2013). Anthropologists, historians, scientists, artists and economists have all acknowledged the role of food (Getzs, 2014). The characteristics of food are embedded in all these areas, resulting in its different meanings (Timothy and Ron, 2013, p. 100). Food brings about various expressions such as: desire, addictions, cravings, love, and hate to rejection or ignorance among others (Kazembe, 2018, p. 34). The same author further expresses that food is important in communication at rituals, religion and culture.

The fact that food is a sustainable product, it offers a qualitative element wherever it is used, and it therefore, inseparable from heritage and travel. (Timothy & Ron, 2013, p. 100). Food and tourism have, until very recently, been so underplayed by the industry. In Israel food is used to promote political goodwill (Institute of European Studies, 2010). This means that the tourism and hospitality industry can use food for various means: emotional, social, political, and economic and even culturally in a destination (Timothy & Ron, 2013).

According to Robertson (2013, p. 13) culture pertains to the diverse nature of different ethnic groups, their set of values, knowledge, language, rituals, habits, lifestyles, attitudes, beliefs, folklore, rules and customs that identify a particular group of people at a specific point in time in a destination and how they interact, organise and live. Culture is enshrined in the “social, aesthetic, and symbolic value, cohesion, joy, openness, expressiveness, play, and diversity; and that experience is not exclusively individual but rather rooted in social and material interaction with other people and the environment” (Ryan and Wollen, 2013: 110). When tourists eat local or indigenous cuisine, they explore alternate lifestyles (Karim, 2014; Long, 2013). Wijaya (2016) concurs with the same opinion, that food provided that reality of a place, because one eats food from a place, they are consuming the place. This relationship between food and culture has been expressed even in daily lived proverbs. It has cultural meanings and heritage values and it is a communicative tool that offers insights of destinations (Karim, 2014). Local cuisine is the ingestion of a cultural system or grammar of food. In Europe, for instance, food is understood more as a social process than a product (Goldstein’s discussion in Institute of European Studies, 2010). It encompasses everything that is important to people. It marks social differences and strengthens social bonds. There is uniqueness in local cuisine.

Food acts as a bond between individuals, families, communities and countries (Staicic, 2013). Attitudes, practices and rituals are discovered through food choice, patterns and eating behaviours (Stajcic, 2013). Food is common to all people, yet it has very different meaning to different people or communities across the globe (UNESCO, 2012). Food familiarises tourists with a local culture and gives a closer touch to a destination, hence its importance in any destination as culture is unique in itself globally.

Recently tourism choices have not been determined by simple biological needs for food. The choice is determined by the need to try interesting products (Clanade Strunci, 2015). This goes to say that tourists are looking for unique food and beverage experiences (Salvin, 2015). As tourists are looking for new stimuli in their sensory profile, cuisine becomes key for the promotion of a tourism destination. Food and drink contribute to tourist experiences. Organisations such as The OECD have a particular interest in food and the tourism experience because it seeks to promote policies that will improve the economic and social well-being of people around the world (Salvin, 2015). The relationship between food and tourism can make an important contribution to such work because food is vital not only for survival and local development, but it also provides the basis for important newly-emerging creative and cultural industries. It is also an

increasingly important part of tourism experiences, as other scholarly works demonstrate, that food cultures around the world are a rich source of cultural, economic and social diversity.

In essence, it follows that the way local people eat, their preparation process and taste of the 'other' unveils the different ethnicities of destinations' cultures (Comert & Ozkaya, 2014). There are value and symbolism in the plate, which will be expressed through ingredients, prepared food, beverages, food production and the food (Comert & Ozkaya, 2014). Not only the ingredients, but the "particular ingredients." This is because the same foods may be used, but the way the ingredient was processed may not be the same, thus, giving different results. The experience of food now in culinary tourism can be explained as the kind of tourism that has a high contribution to the motivation and behaviour of travel to live a unique food and beverage experience (Salvin, 2015). The tourist experiences the region's 'unique,' different and unforgettable food and specific gastronomic assets that are peculiar, while giving a destination a competitive edge through its local food" (Comert & Ozkaya, 2014; Long, 1998). In Europe, for instance, food is understood more as a social process than a product (Goldstein's discussion in Institute of European Studies, 2010). It encompasses everything that is important to people, marking social differences and strengthening social bonds.

In culinary tourism every aspect related to foods used by a specific group of people are experienced. As reiterated earlier in the definition of culinary tourism, urban regions, restaurants, rural farms, farm stalls, and fruit picking sites, cheese manufacturers, and honey producers, processes of preserves, cafes, tea gardens and bars are visited (Salvin, 2015). Culinary tourism is demonstrated by all the estates productions locally owned as well as managed. This also follows the processing of products being done using local methods which are authentic. In this scenario the local community are the immediate beneficiaries. Culinary tourism provides an experience where community heritage and regionally produced food and drink are used to tell a story or to convey some aspects of the culture of a region being visited (Hall and Gossling, 2013). Food is engraved in the culture of a group of people and reflects the way in which a particular social group thinks about food and their cooking style (Salvin, 2015). Various aspects come in which include basic food stuffs available, typical flavours, eating habits and characteristics of a particular cultural group (Du Rand et al., 2016). Knowledge is transferred about the people's culture, tradition and identity of the place, of which the skilled thoughtful refined cooking and style belongs to this particular group. It is against this background that this study's focus argues that the indigenous culinary claims reveal all the unique aspects

of a cuisine resulting in its authenticity. This is all about culinary tourism, which the tourist is looking forward to experience when they visit.

Culinary tourism can create distinctive atmospheres that are so important for an unforgettable travel experience by connecting the tourist with local culture, landscape, and food (Comert & Ozkaya, 2014). Furthermore, tourism destinations can create a strong image by exploiting unique culinary features and cultural assets (Wolf, 2018). The critical relationship between tourism and gastronomy needs to be considered seriously in culinary researches.

Tourism based on gastronomy has contributed significantly to the economy of countries, specifically local communities. Success has been in France, Italy, Spain, Australia and Germany, with Germany being the Wine World and the Cheese World being France and Switzerland (Comert & Ozkaya, 2014). In these destinations restaurants are also serving local food from local ingredients in response to consumer demands (Bjork & Kaipinen- Raisanen, 2014; Okumus, et al., 2013). Customers' choice being centred on authenticity, ethics, sustainability and health issues. When destinations attract tourists, the value is in the 'newness' in offers (Stone et al., 2018). Therefore, destinations should continue to use food as it is an important tool for tourism development and growth. There is a compelling need to offer something new and different, thus those local dishes which reflect people's culture. It is the aim of this study to revive the ailing Zimbabwean cuisine by studying the indigenous culinary claims through molecular gastronomy. This is a holistic approach towards cuisine development for authenticity and uniqueness. Researchers such as Baruah, (2016); Lopez Guzman et al, (2014); Stone, Migacz & Wolf, (2018); Wolf, (2014). have identified the role of food in defining a destination's culture, heritage and identity through tourism as follows:

1. Local heritage and culture is experienced through a destination's food since it makes use of local ingredients which shows the geography of an area.
2. Food consumption is used in the development of a destination image.
3. Food plays a strategic role for a destination's brand and image
4. Food strengthens the region's identity, sustains cultural heritage, strengthens local product and promotes traditional foods
5. Gastronomy tourism is an instrument to promote a destination through food attractiveness and a business strategy for agriculture and the food industry.
6. Making use of local ingredients is a constant process of learning and improving own cuisine which is determined geographical area

Food is a basic requirement for any traveller, and it becomes one of the key issues when making holiday plans. Food therefore plays a strategic role for a destination's brand and image. It is also significant in retaining destination identity, distinctiveness and attractiveness. Branding involves a process of drawing and managing a product's elements to develop a positive image to attract and retain customers. (Getz and Robson, 2014; Lai et al., 2019). The product comes in the form of festivals and farmers markets, culinary events and restaurants (Smith and Costello, 2009). Food experiences are connected with memory (Lopez Guzman et al, 2014; Stone, Migacz & Wolf, 2018). Cuisine is provided in a number of restaurants where tourists have their meals; therefore, they are able to choose what they like.

Local food has been found to be an important element of the tourism experience, which adds value to recreation at a destination (Molina & Ochoa, 2018). Tourists seek a variety of authentic experiences different from their normal routines. Therefore, there is need for continued development of unique cuisines. Shalini and Duggal, (2015, p. 5) quote a cuisine guru Brillat-Savarin who stated that, "The discovery of a new food dish confers more happiness on humanity than the discovery of a new star". This statement implies that when a new dish is developed, there is a lot of joy as customer will be excited to experience the new taste. Food and cuisine have long been used to promote tourist destinations. López Guzmán, José, and Elide (2016) and numerous other research studies confirm the significance of food in contributing to a enjoyable tourist experience. Food is an important part of the culture of a region as it manifests intangible heritage (Gheorghe, Tudorache & Nistoreanu, 2014) and it is linked to the culinary history of a country. Tourism realised that "experiencing" a country's food is essential for understanding its culture (Upilhyay & Sharma, 2014).

The visitor is allowed to access the heritage of a destination through tasting, experiencing and purchasing of local food products, at a lower price range and in a non-fine dining but rather rustic dining ambience (Upelhyay & Sharma, 2014). Uniqueness can be achieved by offering diverse experiences, where processes of producing and consuming food are presented which tourists can partake in (Francese fuste Forne, 2016, p. 27). Developments like the Slow Food Movement which aimed to resist Global standardisation by promoting locally made, authentic and traditional gastronomy played a role in preserving local foods from extinction (Pollan, 2008).

Gheorghe et al (2014) in their research gathered that culinary tourism, is an authentic experience of a sophisticated lifestyle, in a pleasant environment related to the good life and economic wellbeing of exclusively consuming high quality grown products. Pullphothongand Sopha, (2016) found out that

culinary tourism in Thailand means experiencing both food and shopping. Thai local products tend to be largely a domestic tourism activity for both Thai and foreign tourists. The culinary tourist visits places which offer unique culinary experience, visiting the kitchens, inquiring about their typical dishes and learning about them (Kalenjurt et al., 2012). Gastronomy tourism is an integral part of agro-tourism and wine tourism, therefore, through buying of agricultural and gastronomic products tourists spend a lot on food (Mao, 2015; Tsai, 2016). Scholars have also found that travellers who experience local gastronomy will have a high level of attachment to that destination, while appreciating its culture (Stoner et al., 2018, p. 26; Thomas & Sumit, 2015). According to the UNWTO (2017) tourists always seek food besides other elements of culture when experiencing or studying visited destination cultures. By promoting local food, it is part of cultural heritage preservation. Long (2018, pp. 321-322) gave the following four forms of culinary tourism:

1. Tours and rails. Restaurants, visits, public events, such as festivals and tasting and cooking classes and demonstrations.
 - a. Restaurants; The most obvious destination.
 - b. Commercial business and may be more oriented or not.
2. Tours and trails; Food tours and trails sponsored by government and tourism businesses. Visitors are taken to venue to visit, view and taste food. Trails are maps and venue listing followed on tourists' way.
3. Public events festivals and tasting; promote local food businesses to tasting offerings of samples of food and discussion of cultures of that food and evaluate its aesthetic quality.
4. Cooking classes and cooking demonstrations; PART of culinary tours. Also connected to tours of markets and groceries or to producer's farms. Tourists have an opportunity for one on one experience.

The next section looks at the destinations which are well known for their cuisines. Their global profile is testament to success in their gastronomy, culinary, gourmet tourism and food tourism.

2.3.5 Most popular culinary destinations of the world.

The terms 'culinary tourism giants' or 'culinary tourism destinations' earmark destinations whose culinary industry is doing well, resulting in their cuisines being popular (Petersen, 2017). Europe is counted as one

of these destinations because of the Geographical Certification (Protected Designation Origin) PDO and (Provincial Geography Indication) PGI (Priviteri, 2020). Europe is considered the home of the highest quality food and drink products. The cuisine is well complemented by the wine. European countries leading the industry include France, Italy, Spain and Greece. Following Europe is The United States of America then Asia (Globadata Survey, 2016; Long, 2018; UNWTO, 2018). There is a high interest in experimentation with new food products in these countries, so their cuisines are invariably up to standard and competitive. In addition to the countries given above, some countries have also taken significant steps forward to exploit their culinary wealth. On the list is: Mexico, Malaysia, Sweden, Turkey, Thailand, Vietnam, Croatia and the Caribbean Islands among others (Lopez et al., 2016; UNWTO, 2013). These destinations offer an enhanced experience of their unique and sumptuous cuisine (Shalini & Duggal, 2015; UNWTO, 2013). Culinary routes are within various specific regions in these destinations as they have been so diverse in their culinary tourism (Lopez et al., 2016). A review of literature on top destinations shows that some of their food products and cuisines have been listed on the UNESCO Tangible and Intangible heritage list (Khoo-Lattimore & Wang, 2019; Pearson, 2016).

UNESCO is a board that is globally recognised for listing destinations and cuisines which have brought meaning and benefits locally, regionally and globally. The board recognises merit by exploring the intersection of food and culture with culinary traditions around the world, as food and culture are interwoven (Avieli, 2013, p. 121). They credit food and cuisines whose culinary heritage promotes local people's actions and which develop tourism (Bessiere, 2013). This is based on the view that food products are an important tourism resource for development (Bessiere, 1998; Bessiere, 2013). They add value, because of the specific characteristics they have, enhancing development of the culinary industry. Cuisine aspects such as recipes are part of culinary heritage and impact the cuisine uniqueness.

Recipes and dietary practices can be used to transmit knowledge from one generation to the next. This shows the significance of exploring the recipes of Zimbabwe through indigenous culinary claims so that the knowledge does not die. The knowledge is also used to revive cuisine on the verge of extinction, and using those cuisines to develop culinary tourism in the destination. As of January 2021, UNESCO recognises 23 food and drink related traditions as part of its Representative List of the intangible Cultural Heritage of Humanity (UNWTO, 2018). The majority of the recognised foods and drinks are from these culinary giants. The following section will highlight the culinary culture in some of the countries listed as culinary destinations. Therefore, according to Riche and Crouch (2000), the nature of a destination is central

to tourism. The major destination attributes being the resources which are available and, in the case of gastronomy, the resource is food. The culinary destinations will be elaborated on next, highlighting issues such as their ranking, culinary/gastronomy/food tourism contribution to their economy, tourist spending patterns, culinary activities, foods and cuisines and general the nature of their culinary tourism. Table 2.2 below show the culinary giants followed by a summary.

Table 2.2: Most popular culinary destinations of the world

Country	Nature of cuisine	Popular cuisine	Culinary activities
Spain	<ul style="list-style-type: none"> -Heritage based on farming and use of local products. -Sustainable products which reduces greenhouse emissions. -Healthy diet. -Products covered by quality certification. - Restaurants with supreme chefs who produce quality cuisine. -Products named from the region. -The recipes are tried and tested by renowned chefs where New and Special recipes are included. 	<ul style="list-style-type: none"> -“<i>Paella</i> “- wine paired with local cuisine. -<i>Dehesa de Extremadura ham</i> -Jerte Valley cherries -L Vere paprika -<i>Villauercas-Ibores</i> honey -<i>Gata-Hurdes</i> olive oil -Foods-cured ham, pork, olive oil, honey, paprika, cherries. 	<ul style="list-style-type: none"> -Official wine route. -Traditional Food Tours.
Italian	<ul style="list-style-type: none"> -Cuisine has a complex and rich history from the various cultures. -Arab influence for some dishes. -Theme of authenticity, local and gourmet. -Restaurants of excellent brewery pubs. -Strong purchase of wine a souvenir. 	<ul style="list-style-type: none"> -<i>Trapanes couscokes</i> which is based on legumes and mutton and fish based dressing. -Mozzarella and pizza. 	<ul style="list-style-type: none"> - Festivals to celebrate various foods. -Hive of activities with street foods, generally fried foods -Shopping, general tourism. -Music festivals.
French	<ul style="list-style-type: none"> -More gastronomy cities with their specialities- e.g. Dijain, -Gastronomic meal of the French was on the World Heritage List. -French government created an “International City of Gastronomy”. 	<ul style="list-style-type: none"> -Raw sea food- 	<ul style="list-style-type: none"> -food and wines and food products, vineyards and restaurants. ‘Gîtes de France’ (rural accommodation) Food and wine festivals.

	<p>Burgandy.</p> <p>-Reknown chefs and fathers of gastronomy.</p>		
Malaysia	<p>-Ethnic groups, own traditional dishes. -Various types of foods and cuisines. -Halal food rich and spicy.</p> <p>-Kitchens have been developed fusion cuisines.</p>	<p>-<i>Beef Rendang</i>, - meat-on-a-stick’ for special occasions.</p> <p>-<i>Satay</i>, cooked over hot charcoals and served with fresh cucumber, onion and spicy a peanut sauce.</p>	
Mexico	<p>-Variety of tourist products and services.</p> <p>-Traditional cooking popular.</p> <p>-Reproduction of heritage cuisine through traditional cooking.</p> <p>-Local and global products overlap.</p> <p>-Industrial and traditional food coexists</p>	<p><i>Barbacoa de Borrego</i> slow-cooked lamb.</p> <p>- <i>Grilled carne asadacos, tacos pastor, calabacitastacos</i> - authentic street corn, - <i>Churros</i>,homemade</p>	
Thailand	<p>- Produces a great variety and quantity.</p> <p>-Branded products on offered.</p> <p>- Sustainable local agriculture producers.</p> <p>- Young chefs reconnecting urban and rural environments through local agriculture producers.</p> <p>-Locals involved and benefit the communities economically.</p> <p>-Diversity by harnessing and rewarding authenticity.</p> <p>-Documenting regional specialities</p> <p>-Fermented fish sauce, mostly shrimp.</p> <p>-A wide variety of leaves in use such as kaffir, lime leaves, provide characteristic flavour in every soup</p>	<p>-Thai soup with characteristic flavour.</p> <p>-Their emphasis is on flavours: sour, sweet, salty, bitter and spicy taste.</p> <p>-Rice dishes are popular.</p> <p>- Combines Thai and Portuguese cooking. “<i>Knom Farang Kudec Jeen</i>”.</p> <p>- Tea and chocolate raspberry cake from Flowers.</p> <p>-Head, tail, bone marrow and innards, liver, blood dishes used.</p> <p>-Insect dishes, such as grasshoppers, crabs,</p>	<p>-Hold rice planting, harvesting festivals.</p> <p>-Most food activities are creative tourism.</p> <p>-Activities to consume food, taste the famous cuisine with legendary.</p> <p>-Food demonstrations by locals are also popular.</p> <p>-Thai meal preparation activities experienced by visitors.</p>

	- Emphasis is on flavours: sour, sweet, salty, bitter and spicy taste.	crickets, pupa and eggs are used in cuisines.	
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Source: Author's compilation.

2.3.6 Summary on culinary destinations

2.3.6.1. Spain: According to the UNWTO ranking, Spain is the world's leading destination in gastronomy. The UNWTO (2018) UNWTO (2017) highlight that it is second in tourism expenditure and 4th in number of tourists, with 10 % FDP and 11% employment (Shalini & Duggal, 2015). Every year Spain receives about 6 million tourists, whose primary motivation is to enjoy the local cuisine. The destination has stuck to the Mediterranean diet and they offer a sustainable diet Guler et al., (2017). This diet is sustainable because it reduces greenhouse emissions by (72%), land use by (58%), energy consumption by (The city Caceres in the region of Extremadura in South West of Spain was declared a World Heritage Site by UNESCO in 1986 because of its wines (Guzman, Di-Clemente, Mogolla, 2014; UNWTO, 2017).

2.3.6.2 Italian: The cuisine is among the most well-know and favourite gastronomy by people around the world. The data from the Italian National Institute of Statistics (Istat, 2019) shows that Italy is booming more than 428.8 million visitors in 2018, 56.5% forex. A follow up to that the data from Banca d'Italia (2020) indicating a 2.2 % increase on the previous year in the number of visitors, and a considerable increase in international tourism expenditure of 6.2 %.

2.3.6.3 France: Current statistics show that food or gastronomy tourism contributed US\$2.3 trillion to the global economy in 2010. In that same year the gastronomic meal of the French was on the World Heritage List. The French government had to recognise this by pledging to create an “International City of Gastronomy.”

2.3.6.4 Thailand: It is one of the Asian destinations with the most competitive gastronomy, and as part of The Asian association of South East Asia Nations, it has realised the integral role of gastronomy in

competitive destinations branding. The role was a key driver to achieve inclusive and sustainable development for local agriculture producers and young chefs which resulted in reconnecting urban and rural environments (UNWTO, 2018; UNWTO, 2017). Thailand won an award of merit from UNESCO for fresh water produce, mountain agriculture for innovation and research, high elevation and cold climate.

2.3.6.5 Mexico: It has a variety of tourist products and services, which satisfies the needs and preferences of the different segments of the international and domestic tourists (Stanley & Stanley, 2015). Their traditional cooking is popular, thus significant for the reproduction of heritage cuisine in a global world. In Mexico local and global products overlap, making industrial and traditional food coexist (Stanley & Stanley, 2015). An example is of a small city called Texcoco, which has a reputation for preparation of slow-cooked lamb, *barbacoa de Borrego*.

2.3.7 Culinary tourism influence in Africa

According to Camillo (2006) cuisines are influenced by ingredients available or through trade. The United States is an example where enslaved Africans brought their native foods such as okra, black eyed peas, and yams. They also incorporated corn and other local ingredients especially in the South (Food and Culture project, 2015). Many typical foods have strong ties to the African tradition and what they offer reflects the native foods of Africa, though they also influenced by their colonisers.

The flavour profiles for Africa (2015) opines that cuisines in Africa are diverse, showing influence of colonisers, interwoven with diet based in indigenous foods. The African cuisine today expresses history and a blending of local ecologies and public cultures. The Africa profile includes the following ingredients beans, black eyed peas, collard greens, corn, millet, okra, peanuts sweet potatoes, and yams among others. Other regions have their own flavour profiles: Asian Flavour profile, European/ Mediterranean Flavour profile, Latin America, Middle Eastern among others.

Couglan and Hattingh (2020) opine that South Africa's tourism is supported by natural attractions, and their food, though food has not done much. Food is slowly rising as a niche tourism aspect, unlike most countries in the Southern region of the continent (Correlcia, 2019). Due to the expansion of this authentic experience where people are seeking for more signature cuisines involving local food, more is most likely to come out of South Africa. In the Western Cape, there are vineyards in the town of Franschoek, (SAT, 2019). The Destination Marketing Organisation (DMO) hails markets Franschoek, as the culinary capital of the

country. The Cape Malay food is iconic in the Western Cape Province and Indian cuisine in the KwaZulu-Natal Province. South Africa is multicultural, and was named the “Rainbow Nation” by Archbishop Desmond Tutu (George, 2018; Government of South Africa, 2019).

In the year 1994 tourism gained momentum in South Africa, leading to the implementation of the White Paper on the Development and Promotion of Tourism in South Africa (Department of Environment Affairs and Tourism, 1996). From then, tourism took its place in the economic sector. Icons such as Nelson Mandela, Cape Town and Table Mountain are well-known worldwide. South Africa has 9 provinces and each has its own uniqueness in tradition (Couglan and Hattingh, 2020, p. 106). Traditional African beer can be tasted, while grinding maize in decorated huts can be observed at the Basotho Cultural village. The Basotho still practise their traditional ways even today (SA Historical Centre, 2018). There are food and cuisine festivals which are held annually, such as Clarens Craft Beer Festival (Couglan & Hattingh, 2020; SAT, 2019).

2.3.8 Culinary tourism in Zimbabwe

In Zimbabwe, tourism is the third contributor to gross domestic product (Woyo, 2018). However, Zimbabwean tourism has been affected due to poor economic performance emanating from the government’s land redistribution programme (Musavengane et al., 2019; Woyo, 2018). Zimbabwe is a destination with more than 20 ethnic groups, with indigenous tribes representing over 97% of the population. The rest are mixed races who have stayed in Zimbabwe for ages. Among these are: European ancestry (chiefly English, German, Afrikaner, Dutch), mixed races (chiefly African-European), and Asians. Shona tribes (Karanga, Korekore, Manyika, Zezuru, Rozvi, among others) (Woyo & Woyo, 2018). Other minority ethnicities are Shangani, Nambya, Nyanja, Chewa, Venda. A variety of foods are grown in these regions and a rich cuisine can come out of these groups, but not much has been done to commodify these cuisines.

In Zimbabwe, visitors are concentrated in Victoria Falls, a resort town where they mainly visit the waterfalls. Hotels in the destination have packaged their local culture in their restaurants for tourist consumption. The hotels infuse local culture history with the food products (Mattson, & Sullivan, 2004). The local delicacies which they provide are cuisines from meats such as kudu, warthog, impala, buffalo, elephant biltong, guinea fowl and Mopani worms. The culinary experience is offered at Mama Africa Eating House and The Boma-Place of Eating (Mkono, 2011, p. 257). The Boma offers top end local cuisine cooked

even to order, on open grills and spits, which are complete with side dishes, starts and desserts. Beside game meats; offal, mushrooms, fish and local vegetables are offered (Mkono, 2013). They have activities such as a Mopani worm sampling stations, where those who brave to sample get a certificate. Local beer is also offered as a welcome drink. They are into what they call ‘slow food.’ Slow food movement items to attract sales advocates for prevention of the extinction of traditional cuisines. One distinct feature of slow food is how ethical it is. It is popular to tourists because some may not want completely new food.

Some destinations are doing their best to provide culinary products which market their destinations so that they become visitors’ destinations of choice. Experiences should also be memorable so that tourists visit again. For that to happen, it is important that the destination produce products which the tourist wants to consume. The next section of the review will delve into the consumption of cuisines by tourists.

2.4 Tourists consumption of indigenous cuisines

2.4.1 Global trends in tourist consumption of cuisines

Recently food has gained a new importance and meaning to people’s lives globally. UNESCO (2012, p. 22) report that, “there is more meaning in food across the globe than mere nourishment.” Food is no longer a need to satisfy hunger or nourish the body, but it has turned to be a lifestyle, a way to relax, feel excited, anxious, delighted, or even being sad (UNWTO, 2021). Consequently, new consumers’ perception of food and its quality in relation to one’s lifestyle and wellbeing have changed (UNWTO, 2021). Furthermore, food is becoming the major reason to travel and the destination choice motivation (Baggi, 2021; UNWTO, 2021; UNWTO, 2018). According to World Food Travel Association (2020), in 2020 53% of all travellers travelled for culinary seeking, showing the growth of numbers of people whose travel is influenced by intention to experience others’ food. Long’s studies (2018 and 2016) show that 88.2% of tourists consider food as a sign component in their selection of a vacation destination and their vacation activities. Furthermore, the Travel trends of people in the US indicate that people are travelling more than before in the last decades (Champion Travel Guides), and in the process seek cultural experiences through food. The United States trends showed outbound tourists raised from 27.5 million in 1996 to 72.5 million in 2016, which was more than double the previous amount. In addition, worldwide, the number of tourists was 1.4 billion in 2018 (The Guardian, 2020). The large numbers visiting culinary tourism destinations resulted in tourist consumption contributing \$2.3 trillion in the global economy (WTTC, 2017).

Statistics from some specific culinary destinations also show tourism consumption patterns and trends with countries such as Thailand boosting of around 48% of their culinary being on meals and food products. The latest from Boutsoukou (2018); Pullphothang and Sophia (2016) Schulk (2018) Uraiporn, Kattiyapompong, Ditta-apichai and Chuntamara (2021) shows 40% expenditure from those who visit to enjoy Thai culinary traditions. These spending and consumption statistics and trends consider both international and domestic tourists, whose decision to visit is influenced by the cuisine (Simasathiansophon, Jotikashira, Onputha & Tiwasing, 2020). These projections are expected to rise sharply.

In essence the UNWTO 2030 Vision forecasts that international arrivals are expected to reach over 1.8 billion by the year 2019. World population statistics show that in the year 2019, 2030 middle class tourists in Asia Pacific will increase more than 38% sustainable tourism. Sustainable tourism is a driving force for the global economy which contributes to the conservation of natural resources, society and cultural attractions (Srihirum & Savant, 2018; UNWTO, 2018). The possibilities are very high as destinations have taken it up to utilising their local food resources into culinary products that tourists consume at the same time benefiting the local communities. Demands for local foods are rising daily globally as more and more people travel to know more about peoples' cultures.

The local cuisine of a destination reflects identities, daily lifestyles, religions, beliefs, habits, traditions, and customs of a society (Sormaz et al., 2016). Examples of culinary resources and events include tea ceremonies in China and Japan (Camellia Tea Ceremony, 2019; Wong, 2016), winery tours, wine tasting, fine dining and wedding ceremonies at wineries in France (Wine Paths, 2019), Italy (Cellar Tours, 2019), Spain (Back et al., 2018) and California (Visit NapaValley, 2019), farm tours in Florida (Florida Department of Agriculture and Consumer Services, 2019), rose harvesting in Turkey (Daily Sabah, 2016) and beer festivals in Europe (La Tr_efle, 2018), to name a few. However, tourist consumption and expenditure on food and traditional cuisines have been found to be at the centre of maximising tourism development at a destination (Dzeagu-Kudjodji, Adjibolosoo & Otoo-Arthur, 2019). The authors' position is tenable because every destination boasts its own unique resources and products. What exactly these tourists seek is a question the next section occupies itself with.

2.4.2 Tourist motivations to travel

Though some travellers may not consume some local products because of various reasons such as health conditions (e.g., food allergies) or psychological factors (e.g., food neophobia) many travellers have been

attracted by local foods (Björk and Kauppinen-Raisänen, 2016). Local foods have brought unique choices for those who visit by providing excitement, relaxation, escapism, status and education as a form of entertainment (Hillel et al., 2013). When people visit any destination, they all consume food, because food is a basic need. What may differ is the extent of product consumption. The extent of indigenous food consumption has not been given in figures, but the information that travellers are spending an average of 1/3 of their budget on food is enough evidence that tourists are consuming local gastronomy. Another point of evidence is that there are few restaurants and food outlets which provide for foreign cuisines, therefore when travelling there is general consumption of the local food.

Tourist consumption is generally viewed as the means by which a tourist satisfies his or her individual wants, through the purchase of tourist products (Xiang, Chonghuan Xu, and Wang, 2021, pp. 482-483). With reference to food and cuisines, it entails the consumption of food, the products and food related activities. In that respect the tourist, who is the consumer, shows one's level of demand for tourist products (Niemczyk, Renata Seweryn, 2014). In the contemporary world, these needs are changing rapidly and they are highly diverse. The consumer represents the market and the levels of demand dictate the need for various goods and services which satisfy him during his leisure time (European Travel Commission [ETC], 2006). Therefore, consumers continue to search for more intense experiences. Tourists continue to seek foods from specific destinations. In support of this Niemczyk Renata Seweryn (2014) opines that a guest's level of satisfaction with a destination should translate into a form of continued loyalty).

According to Mark (2018) motivations underlying tourist food consumption come in many ways. Pearson and Person (2017) argue that tourists are attracted by a range of foods and services that are distinguished from others and appear attractive to potential visitors. High quality cooking and distinctive cuisine from local foods plays an important role. Tourists visit places that offer unique culinary experiences. When they are there, they get into host kitchens where they inquire about their physical dishes and learn more about the ingredients and spices for a particular meal (Du Rand, 2016; Kalenjuk et al., 2015). Travellers are looking for inclusive experiences that include food/ wine/ beer tour, tasting trails, farmers markets, food stalls, gourmet. They visit beverage retail stores, are involved in factory tours and food and beverage events. (UNWTO, 2021; UNWTO, 2017).

With contemporary trends in travelling it is important to have a deeper understanding of the intentions to travel and discoveries tourists are seeking in those places (Baggi, 2021). Many studies since the inception

of culinary tourism have generally shown that the increase in travelling is due to tourists seeking out adventure in food, specifically local food as part of their culinary tourism experiences (Baggie, 2021; Bessire, 1989; Kline et al., 2018). In addition, Kline et al (2018) states that many tourists' focuses, seems to have changed. The change being described by the author as from the classic 'must see' physical sights such as museums and monuments towards a 'must-experience' imperative to consume intangible expression of culture, such as atmosphere, creativity and lifestyle. Zimbabwe has a variety of foods, which can be made into product culinary experiences. More should be done to make it a pull factor for culinary tourism development

According to Sims (2009), today's travellers have shown a preference for authentic, artistic foods prepared following traditional recipes that emphasise the culture of a place. Indigenous food is culture and as such it can offer the culinary tradition experience through the consumption of both the tangible and intangible expression of culture. Furthermore, tourists have increasing expectations for food quality, creating demand for a wide variety of dining options. In addition, there is growing emphasis on regional specialties from around the globe (Fox, 2007; Kivela & Crofts, 2006). Resultantly, culinary experience can add value to tourism as tourists are linked with local culture, landscape and food. Therefore, tourists have an atmosphere that allows them to have a memorable travel experience, giving them an intention to revisit a scene (Kivela & Crofts, 2006).

The memorable experience should be a positive one for it to motivate revisits. In this scenario the local food can provide for that positive memorable travel experience. According to Awasthi, Sangeeta and Lomte (2020) all types of food are based on the destination's culture and or religion, demonstrated by the use of different types of ingredients which determine their taste and authenticity. Therefore, authentic dishes and local foods can develop an attractive tourist product. Today gastronomy is increasing its ability to attract different types of tourists (Komaria, Razzag, Nugraheni, Lastariwati & Mahfud, 2020). Besides traditional food involvement preserves the local culture heritage of ancestors, which fulfills tourist desires. According to Ting et. al (2019) it seems that tourists support such destinations and choose traditional food in respect of local cultures. Therefore, destinations providing regional diverse food choices encourage tourists to explore alternative food choices (Barrena and Sanchez, 2013). This scenario gives room for every traveler to find their own choice from the wide range of cuisines. Consumption of indigenous food is influenced by factors which are discussed next.

2.4.3 Factors affecting consumption of indigenous cuisines.

The provision of a cuisine should be able to lure visitors to experience a place. However, many factors have been found to influence local food consumption. According to Madaleno et al (2019) and Lumbers and Eves (2012), these factors include: socio-demographic traits, cultural background, and religion, past experiences, food-related personality, previous experiences and ideas that lead to motivation. The same authors add that when talking about motives with regards to local food consumption, there were found nine main ones: escaping from the routine, authentic experience, togetherness, prestige, sensory appeal, exciting experience, health concern, getting knowledge and the physical environment (Madaleno et al., 2019; Sthapit, 2018). Food-related traits of personality have been seen as another substantial variable influencing food consumption in visitors (Madaleno et al., 2019).

While some authors have highlighted specific factors as those given above, Randall and Sanjur's (1981) theoretical model has been used repeatedly to understand tourist consumption of local products (Mark, 2018). The model classifies tourist food consumption factors into three broad categories: the individual, the food and the environment (Mak, 2018). Of importance to note is that these factors are interrelated, so are difficult to isolate and explain one without mentioning others. These categories cover almost all aspects of consumption from various researchers. This review will use them to explain factors which influence the consumption of indigenous cuisines. The questionnaire used in the study also included these factors to assess the extent of cuisine consumption by tourists in Zimbabwe.

The first category has individual factors such as the socio-cultural, psychological, and physiological factors which are recognised to exert direct or indirect influence on food consumption behaviour (UNWTO, 2017; UNWTO, 2018). These factors related to the individual are extremely crucial in experiencing the variations in food consumption (Rozin, 2006). This is true as individuals differ, even from a family level, consumption differs according to individuals, due to individual specific differences, some beyond one's control. The physical aspect is from the consumption setting, the built environment, what is local and regional, and in this case the local and regional food. Specifically, Rozin (1996) argues that cultural background has a strong influence on food choices. However, tourist choices will adjust to other eating habits and sensory properties.

Food has been explained to contribute sensory attributes such as flavour, aroma, texture, and appearance. These sensory attributes are still influenced by physiological and psychological factors, which may also be

of a socio-cultural nature. According to The UNWTO (2017) tourist motivations are influenced by physical and physiological needs (sensory perceptions and hedonism) security, cultural and social needs, need for prestige (local delicacies) status or self-realisation. This shows the interrelatedness of these factors. However, the environment presents cultural, social, economic and physical influences as well. All these factors can then be merged to ensure the tourist is fully satisfied within the local community providing the cuisine.

It is well-established that tourist preferences differ. Scholars have supported this assertion when they say that there is need to understand tourist profiles of culinary tourists and their behaviours, as it assists in planning how to tap that into the culinary tourist (Ellis et al, 2018p. 42). While looking at these factors it is important to note that most factors are interrelated. The origin of the tourist has great influence on the characteristics and behaviour towards a cuisine and intention to consume it, though it also goes in relation to age, gender and other social factors. On that note, the local cuisine of a destination has its unique and specific taste, according to its regions and cultures that may be liked more by visitors coming from a certain region. Similarly, it may be a question of greater familiarity with a specific region which results in developing a taste for the particular cuisine (Kline et al., 2018). However, as Kline et al, (2018) note, “the way to the heart is through the stomach.” Therefore, this study aims to come up with cuisines that tourists want to taste in order to have that experience, which is lacking when they visit the destination Zimbabwe.

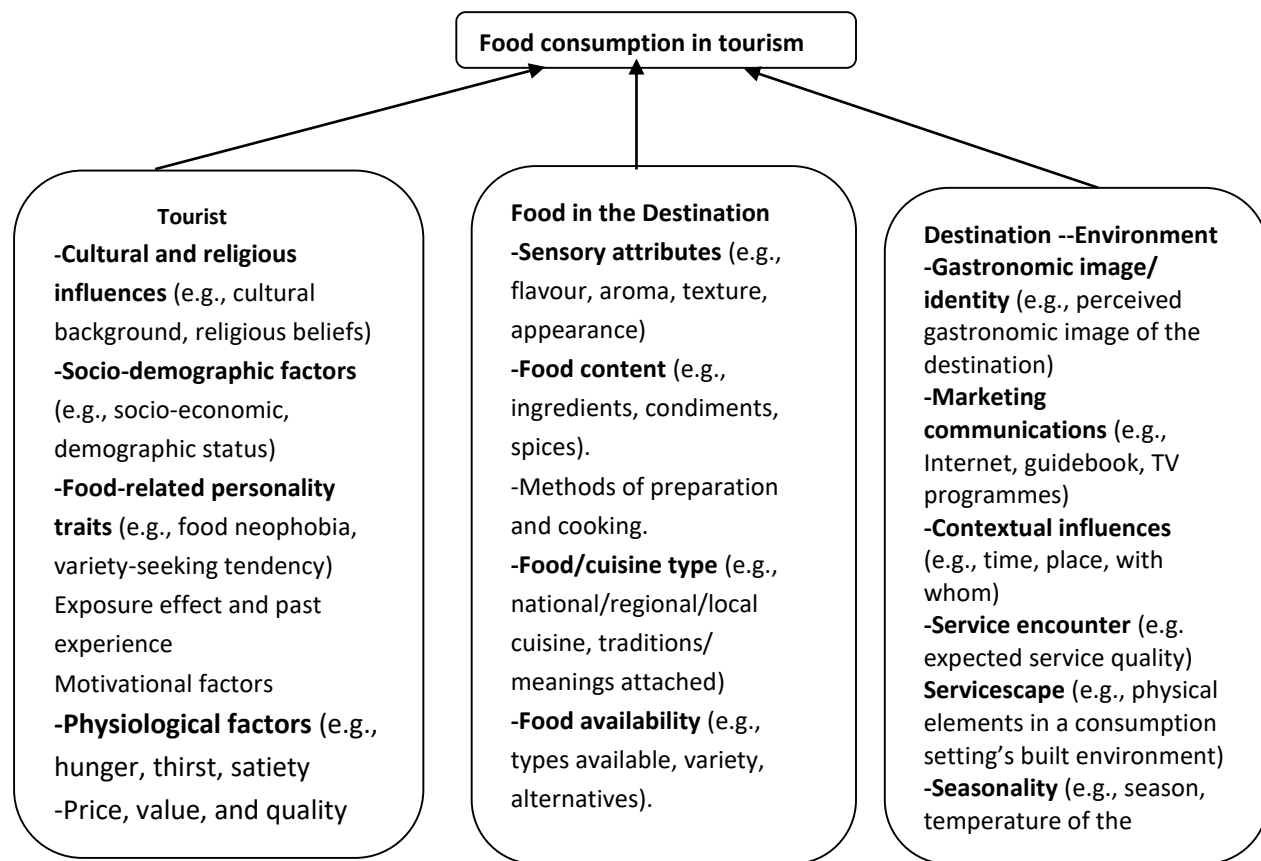


Figure: 2.1. Factors Affecting Food Consumption in Tourism (adapted from ‘A Theoretical Model for the Study of Food Preferences’, Randall & Sanjur, (1981).

2.4.3.1 Socio-demographic Status and Food Consumption

Socioeconomic and demographic statuses are one of the most commonly used variables to predict food consumption patterns (Promsivapallop & Kannaovakun, 2020). The term socioeconomic status refers to the level of the social and economic position of people within society as revealed by various indicators. The main social indicators used for most of the empirical studies are education, employment, type of job, and the commonly used economic indicator like annual household income. Though the statement demographic factors may apply, the frequently used indicators are age, gender, and marital status (Srivastava, 2015).

Social theorists and empiricists studying food consumption have generally looked at the influence of socioeconomic and demographic variables on dining out, frequency of eating out, money spent on food at

home and outside the home (Promsivapallop & Kannaovakun, 2020), a strong relationship exists between socioeconomic status and food consumption such that when people change social class, they subsequently change their foods. Analysing education's influential role in food consumption patterns, Goody (1982) and Symons (1991) theorise that societies whose populations have higher education have more differentiated cuisines. Education and cuisine reflexivity are mutually reinforcing, with reflexivity defined as thinking, discussing, and experimenting about food. With respect to social indicators empirical studies have shown positive significant association between education and eating out, eating at ethnic restaurants and the number of places chosen for dining out (McCracken & Brandt, 1987; Warde & Martens, 2000; Warde, Martens & Olsen 1999).

Employment status as a social variable showed strong association with the white-collar occupational group having exposure to a wider number of restaurants (Warde, Martens and Olsen, 2000) and eating at better or elite restaurants (Erickson, 1996). Interestingly enough, Erickson (1996) found that there was no significant difference between different occupational groups and eating at fast food chains. Household income is positively associated with the frequency of dining out, consumption at ethnic restaurants, and breadth of exposure to ethnic restaurants (McCracken & Brandt, 1987, Warde & Martens, 2000; Warde, Martens & Olsen 1999).

With respect to the influence of demographic variables on dining out, marital status showed a significant association, with married people eating out more often (Smallwood, Blisard, & Blaylock, 1991). Age showed a significant positive association with respect to dining out, consumption at ethnic restaurants, and exposure to a wider variety of ethnic restaurants (McCracken & Brandt, 1987, Warde & Martens, 2000; Warde, Martens & Olsen 1999).

With respect to tourist food consumption, studies that have looked into the food consumption of tourists have showed a strong association between socioeconomic status and demographics with the tourist's food consumption patterns. According to Cohen and Avieli (2004), even though tourism has expanded into the lower and lower middle classes in Western society, when it comes to food consumption, they possess conservative tastes. Their exposure to foreign foods at home is not substantial, unless a food has reached the status of a world cuisine. This suggests that there is the possibility of an association between socio-economic background and tourist consumption of local food. Smith (1983) and Zelinsky (1985) show empirical evidence of this association in their respective studies that analysed the geographical distribution of restaurants. The general socio-economic status, the level of affluence, education of the community, and

a high turnover of tourists are the factors affecting the distributions of ethnic restaurants. Thus, an educated, urban community with a considerable discretionary income causes a growth of diverse restaurants.

The importance of socio-economic variables has been studied extensively in wine tourism (Bauman et al, 2019; Carmichael, 2001; Srivastava, 2015). These studies have provided empirical evidence of the wine tourist as a relatively well-educated person belonging to the professional or managerial class. In another study concerning wine tourism, Carmichael (2001) found the majority of the Niagara wine tourists to be between the ages of 31-70 years, while Bauman (2019) found wine tourists of British Columbia to be relatively younger than non-wine tourist. Though income had a positive association with the tourist's expenditure on food, Cai, Hong and Morrison (1995) found that expenditure was income inelastic. With respect to demographic variables, Cai, Hong and Morrison's study (1995) found that the age group 25-34 spent less on food compared to tourists over 65 years, and married tourists spent more on food than single tourists.

To conclude, all these empirical studies reveal the significance of socio-economic and some demographic variables in food consumption away from home. The importance of these variables is also seen in tourism studies and the special interest market of wine tourism. Tourism is a leisure activity and is more or less dependent on discretionary income. Education plays a significant role in increasing one's breadth of knowledge and skills, including leisure skills. Further, tourists who travel for food or wine view it as an investment in gaining more knowledge. Thus, overall income and education are the most significant predictors of the tourist's food consumption, along with age and marital status. The food image is an important factor, and seems to be integral since it describes how the food portrays itself to the consumer.

2.4.3.2 Food image

Local food consumption can be influenced by local food image itself. Food image comprises aspects of food quality such as safety, labelling, health, taste, price, and organic properties (Seo & Yun, 2015). Cuisine authenticity is the main aspect which gives a destination cuisine an attractive food image and is derived from the organic properties. Ultimately the food image is derived from the distinctiveness of local food and its role within the local culture. According to Promsivapallop and Kannaovakun (2019) food preferences are influenced by food image. Food image is important to the marketers as they use it as the marketing point for the local cuisine (Getz & Robinson, 2014). Therefore, destinations have created food images that continue to attract visitors and that succeeded in increasing tourist inflows.

Nelson (2016) has noticed that there are very few examples of local people who are able to create a local image in the field of food tourism destination and local tourism promotion. This implies that they have failed because their products have not been that authentic with reference to their indigenous cuisines (Folgado-Fernández, Hernández-Mogollón, and Duarte, 2017). Other factors related to food provision places such as menu, menu variety, ambience, accessibility and service staff strongly influence food image (Karim & Chi, 2010). In addition, food activities such as gourmet food store and cooking classes contribute to the food image of a particular destination (Lai, Khoo-Lattimore & Wana, 2017). Authenticity, variety seeking and hedonic taste, indigenous cuisine image sought by tourists. The conceptual framework indicated these aspects of cuisine as the focus of the validation which was done. These attributes are important because they form the basis of an indigenous cuisine bringing its flavour experiences. Through the indigenous culinary claims and molecular gastronomy, the Zimbabwe cuisine' authenticity is known, and more products for variety emerge.

2.4.3.3 Authenticity

In general authenticity is demonstrated in the food production methods, its heritage and tradition. In the tourism context authenticity refers to the tourist's personal appraisal of their experience within the destination visited (Jain, 2014). However, others have said that authenticity is all about genuineness, originality and cultural attributes (Folgado-Fernández et al., 2017).

Authentic and attractive local food have been found to influence tourist decisions for a holiday destination (Folgado-Fernández et al., 2017). Local food then becomes the platform for learning about the culture and identity of tourist destinations. Kunwar (2017) supports this and opines that traditional food acts as a channel to know and experience a new culture. Smith and Xiao (2008) add that tourists do not eat only to satisfy hunger, but also to learn and experience the local culture through local ethnic food. Ethnic foods are the essence of cuisine authenticity. Such foods are original and have their original taste. Though food products may be the same the methods of preparation from farm to plate bring out the authenticity

2.4.3.4 Authenticity and food experience

Authenticity is an important element in tourism. The sense of place can be felt when one is consuming what is unusual, which may be a good experience for one and bad another. According to Everett and Aitchison, (2008), that sense of place for a destination and regional identity are all related to authenticity.

Resultantly consumers' behaviour intent is favourably affected if it is viewed as authentic (Oh, 2019). Authenticity has been recognised as a predictor of travel experience and satisfaction in the tourism literature (Sthapit, 2017) and tourists have much interest and enthusiasm about trying new foods while visiting a new location. Empirical research has found that there is a positive relationship between authenticity and the tourists' experience (Coudounaris & Sthpit, 2017). A high level of authenticity leads to high quality food tourism attributes, which lead to better levels of tourist satisfaction and loyalty (Zhang, Chen, Hu, 2019).

The actual authenticity is what the indigenous cuisines are losing, as the older generation depart before the information is documented. Collecting the indigenous culinary claims will bring back the authenticity of indigenous cuisines in Zimbabwe, which will revamp the destination's culinary tourism, encouraging more consumption through enjoying the genuine cuisines.

Authenticity has been divided into three categories, according to the desire for authenticity, as authentic seekers, moderate and comfort seeking (Ozdemir & Seyitoglu, 2017). The degree of authenticity they seek differs accordingly, with the authentic seekers seeking real authentic cuisines. The authentic seekers are the culinary enthusiasts, whose aim is to consume indigenous traditional culinary traditions (Everett & Aitchison, 2008; Kim, et al., 2009). Therefore, there is every need to tailor a cuisine to suit consumer needs in order to enhance the tourist experiences (Burgess, 2014).

Authenticity of culinary experience is gauged from how the tourist actively justifies their engagement with food culture of a destination through participation in cooking. Some culinary products are outcomes of the process of authenticity and used to enhance the attractiveness of the products (Fox, 2007; Stoilova, 2015). The term authenticity shows the ability of a destination to deliver different gastronomic experiences to tourists (Seo, Yun & Kim, 2017). Because of different ways of authentic experiences various gastronomy experiences have been designed for tourists. Tourists patronise food markets and purchase takeaway food, raw food materials for households use, participates in culinary events and cultural workshops beside consumption of food at the restaurants and outlets.

Though research on tourist consumption seems lacking, there is support for the view that tourists enjoy indigenous foods consumption, particularly items of local or ethnic nature. (Walter, 2017). Tourist acknowledge local or ethnic cuisine (Lunchaprasith and Macleod, 2018) and many destinations have utilised their culinary resource to make diverse culinary products to lure visitors to their destinations.

Zimbabwe, with its rich and diverse cultures and indigenous foods, can revamp their culinary tourism in the same way.

According to Sims (2009), traditional food is an experiences, to express themselves, resulting in the commercial success of a destination. Thailand was known for its food resulting in international tourists visiting to seek for authentic foods. This was supported by Walter (2017) whose study found out that the relationship between the concept of authenticity with food and tourism relates to traditional food markets, food promoted in a traditional food market to stimulate visitor engagement in food culture for potential of food to be promoted to a tourist product. (Lunchaprasith and Macleod, 2018, p. 102).

In Thailand, with a population of 65 million (Thailanometers, 2016), international tourist arrivals in 2015 were 29.9 million, a rise from 24.8 million in 2014 (Naational Statistic Office, 2016). Recent statistics show that, international tourists in The US were 63.2 million in 2015 WTO, 2015, and Domestic-138.89 million (Tharissetziky, 2016). Traditional food markets were between 3 000 to 7 000 each day. Thailand employs the concept of authenticity and negotiation of traditional and modernity throughout the process of creation, promotion and consumption of food experiences. Variety seeking is one aspect of the tourist of the cuisine that tourist will be seeking when they visit and it is explained next.

2.4.3.5 Variety seeking

Variety seeking is defined as “the consumer’s inherent desire for variety due to factors such as changes in taste, changes in constrains and changes in physical alternative” (Reynold, 2016). In simple terms it is the need for stimulation, with respect to food as the factor that aims at providing variation in stimulation through varied food products. Variety seeking is viewed as important in explaining tourist food consumption. The culinary tourist is exposed to a wide variety of regional speciality for them to choose. Meaning that tourists demand a variety of culinary traditions and variety within the culinary system (Mlz, 2014). Further, the author opines that Thai, Japanese, Indian and Ethiopian diners in ethnic restaurants sought variety of culinary traditions, and are more of variety seekers that authentic seeker. According to Reynold (2016) culinary tourists expect an indigenous culinary system which has a variety of dishes which will vary culinary experiences. His study on local Balinese dishes revealed a greater number of tourists complaining about the limited selection of indigenous dishes. It was also one of the important aspects of their consideration in cuisine choice. Above food taste is an important factor to be explained under hedonic consumption, in the next section.

2.4.3.6 Hedonic consumption.

The concept hedonic consumption was borrowed from consumer behaviour. According to Holbrook (1982, p. 92) it refers to “those facets of behaviour that relate to multi-sensory”. Hedonic experience is all about the aesthetic or physical enjoyment provided by food. Emphasis is on the taste of food, with preference on a specific cultural practice. One desires for complex cultural dishes including elaborate foods. Besides being a physiological sensation, it is also a social, emotional and intellectual pleasure. The social pleasures through eating food with family or friends, emotional pleasure is experienced through food that evokes pleasant memories, while intellectual pleasure involves cooking a fine meal, appreciating finer diner foods and consuming beverages (Lumber et al, 2015).

In relation to hedonic consumers, there is the contrary group, which takes a practical attitude to consumption. This group is growing significantly globally, as customers are more health conscious. The practical are goal oriented and they focus on functional aspects of food. They prefer simple cultural foods and dishes. They desire for practicality in food consumption, focusing on the end benefits of energy, calories and nutrition (Yong and Kim, 2018). They aim to satisfy hunger, convenience, price and efficiency of service when they dine out (Park, 2004).

Hedonic attitudes might operate on cognitive and affective levels. However, the cognitive element dominates the utilitarian consumption attitude whereas the hedonic attitude is dominated by affective element. Although, in general, the utilitarian attitudes and the hedonic attitudes towards food have well-defined sets of universal attributes, one’s cultural background may sometimes define them. For example, diners at fast food restaurants in Korea considered the standardised and efficient appearance of franchised fast food exotic, and the fast food restaurants a fun place with novel ambience Park (2004), thereby showing a hedonic value to eating at fast food restaurants, and implying a cultural relativity to these attitudes.

2.4.3.7 Food Neophobia

The term explains traits of avoiding unfamiliar foods or foreign foods. Though food neophobia was related to being adventurous, studies have also shown that perceived dangers of foods and social influences are the sources of food neophobia (Shoney, 2005). Resultantly food neophobia influences food perceptions, attitude, preferences and consumption. Such people may have negative perceptions towards novel foods, hence prefer more familiar as opposed to unfamiliar food (Cohen &Aviel, 2004; Caber et al, 2017;

Promsivapallop & Kannaovakun, 2019). A point to note is that the degree of food neophobia varies with individuals. However older individuals have less neophobia and have more dining experiences to various types of new foods.

Food in the category includes edible insects, which are deemed disgusting by some and as ‘pests.’ For developing countries, Zimbabwe included, food borne diseases have been cited by tourists (Lepp and Gibson, 2003). Those who are for exotic foods are named food neophilic tourists. They go even for different worms, eggs and insects when they travel to destinations such as Mexico and Thailand (Picher, 2004, p. 78).

Food consumption can be from exotic to familiar foods, and from inedible to edible, but in culinary tourism it has always been the opposite (Long, 2004). To some the inedible or unpalatable depends on personal taste, personality, preferences and aesthetics (Caber et al 2017; Shanoy, 2005). However, the tourist is affected in either way. Food neophobia is very much related to the tourist health concerns with regards to the food at hand. Resultantly, the visitors’ perception towards a food determines extent of participation in culinary or food tourism (Shanoy, 2004). Finally, food neophobia is very much related to the tourist health concern with regards to the food at hand. Resultantly, the visitors’ perception towards a food determines extent of participation in culinary or food tourism (Shanoy, 2004).

2.4.3.8. Food Related activities involvement.

Food related activities involvement concept was borrowed from social psychology and marketing literature. It was found to be important in understanding those who participate in leisure activities and tourists’ behaviour during a vacation (Kyle, et al, 2004). Several definitions are available from different fields where the concept is used. The general definition used is from Havitz and Dimanche (1999: 123) as, “an unobservable state of motivation induced by a particular stimulus.” Despite varied arguments about enduring involvement, there is a consensus that leisure research strongly supports the conceptualisation of involvement as a multi-dimensional construct (Kyle et al., 2004 Manning & Bacon, 2003). It involves so many dimensions which include: personal values, importance and risk perceptions, interest, excitement and enthusiasm for product class activities or information, all influencing leisure activities or travel behaviour patterns (Shanoy, 2002). Leisure involvement studies have shown dimensions such as social bonding, identity affirmation and identity expression in addition to attraction and centrality and identity. According to food and tourism literature, involvement with food related activities daily is seen as a beginning of

participation in food tourism (Long, 2004; Mitchell & Hall, 2003; Sharples, 2003). This means that there is a relationship between activities involved at home and those in special interest tourism, such as culinary tourism, considering complexity of culinary tourist involvement. These activities include: eating at ethnic restaurants, viewing television cooking shows, cooking a range of styles of food at home, learning new techniques of food preparation, experimenting with wide range of cuisines, or having a hobby related to food such as collecting recipes and cookbooks (Long, 2004; Mitchell & Hall, 2003). There is exploration of one's identity and that of the "Other." In conclusion it is justifiable to opine that enduring involvement with food related activities is positively related to food tourism (Shanoy, 2004).

2.5 Indigenous culinary claims.

2.5.1 History and background of indigenous culinary claims

Indigenous culinary claims are from "The Kitchen Stories" project which explores the kitchen as a design space and cooking as a social activity. According to Fooladi and Hopia (2013) the project aims to cultivate communication and collaboration in the kitchen by making people's cooking experiences explicitly recordable and shareable in an interactive digital cookbook. This allows them to preserve cultural and social roots and stimulates cross-cultural and cross-generational idea fertilisation. This implies looking at indigenous cuisine traditional knowledge is central to the claims.

Food traditions were derived from knowledge that has been tested over time and the testing was done through trial and error. History says that these traditions or rituals of food preparation, together with communal food consumption, have played a central, integrative role in human society (Kwik, 2008). At the same time these rituals of food have formed an essential means of bringing people together, of establishing human existence as a social existence (Caber et al, 2017). Examples of this reunion of people are at meals marking special occasions, food processing and harvest, and inter-generational sharing of recipes and culinary skills. This sharing of recipes was in most cases done verbally, such that if not used was forgotten. Not everyone had the necessary knowledge skills to replicate flavours through food preparation, though some parents and experienced chefs attempted to follow the specific methods.

Traditional food knowledge can be one means of asserting cultural identity and can be a way to connect people to the natural world. Research has shown that most traditional food knowledge has not been passed forward, but rather side-lined as an abstract historical concept (Du Rand, Booysen & Artkinson, 2016;

Fooladi & Hopia, 2013; Mnguni & Giampiccali, 2015). Only recently have the losses in cultural heritage, such as traditional food knowledge, garnered academic and policy attention. Transmitting this knowledge is one important means of fostering sustainable livelihoods, ecosystem health and enhanced individual and community capacity to be on the forefront in providing the unique taste to the locals and international visitors. There is evidence of use of culinary claims by the French in the development of their cuisine, which is known for its high quality (Foodie & Hopia, 2013). Therefore it has resulted in the distinct expressions of taste and place facing a continuity gap in cuisine development and sustainability. At the same time traditional food knowledge can provide an individual with the capacity to prepare meals that are nutritious, safe and culturally relevant. The distinct expressions of taste and place are facing a continuity gap when traditional food knowledge is not passed forward, but rather side-lined as an abstract, historical concept.

2.5.2 Significance of indigenous culinary claims in cuisine development

The destination brand can be enhanced from these culinary claims, which the French and other destinations have retained in their cuisines. Indigenous culinary claims bring the uniqueness of a cuisine, through use of specific foods processed in a specific way. Through the culinary traditions of a particular region all the aspects of the cuisine characteristics which include: choice of ingredients, processing, the preparation, cooking, how the food is presented and the ways of consumption are described (Skry et al, 2018). These variables determine the local cuisine's uniqueness, as they are very specific statements to a group of people or region. They have the answers to the how, when, what and why of the food preparation processes and procedures, resulting in specific results. In addition, the resultant product differentiates one dish and cuisine from another (Kloss 2013) giving it a marketing point. This uniqueness is from the culinary narratives from the indigenous knowledge which have been passed from generation to generation, mostly verbally and without any documentation, "the indigenous culinary claims" (Burke, 2016; This, 2013). First and foremost the type and nature of food used determines cuisine authenticity, which the tourist is looking for. Second, the typical method of processing, preparing and cooking determines the type and character of a local, regional or global cuisine and it is the recipe which spells out the does and don'ts, the what, how, when and how of the product procedure. A special attention to these claims has all the answers to culinary traditions and quality and authentic cuisines of a region (Fooladi & Hopia 2013; Ngulube, Dube & Mhlongo 2015).

To elaborate further on the significance of indigenous culinary claims in cuisine development, in Africa and Zimbabwe, the use of available resources such as: indigenous vegetables, green grass seed, edible insects, and spice materials which provide vitamins and proteins are generally used (Gundappaadyana Kendra, 2012; Manditsere et al, 2018). The use of such available resources gives a specific product quality, as they also denote how these are combined. These ethnic foods are used to produce the distinct cuisines of a destination (Moyo et al., 2016). Even when the same food is grown in different regions, a difference should be noted on the end products. This unique quality is what the tourist wants to experience when they visit, while the taste for that cuisine may be the motivation for choosing the particular destination.

When tourists are satisfied, they will have a memorable culinary experience of the destination and they have the desire to visit again. Satisfied tourists are also most likely to spread the experience through word of mouth, therefore marketing the destination. In addition, travellers experiencing local gastronomy expressed a higher level of attachment to a destination, through food which unites visitors to a local culture (Stone et al., 2018; Tsai, 2016).

The French have excelled in cuisines and to this day their styles, equipment and language are used globally in the cuisine world (Foodie & Hopia, 2013). Many episodes are noticeable in this development process. These include the scientific verification of over 25 000 collected claims, which is said to be ongoing for authenticity and further development using science and technology (Sarioglan 2014; Ivanovic et al, 2013; Foodie & Hopia, 2013). The process uses multi-sensory experience to develop personal understanding of taste and texture (Kwik, 2008). This is done through “molecular gastronomy,” and for the French, resulted in the production of quality and diverse cuisines. Though diverse, their cuisines did not lose the French touch. The influence of culinary claims hence cannot be disputed.

The culinary claims give a pattern of food events and eating behaviour in each culture’s cuisine, which is an essential aspect of food and culture (Farb, 1980; Goode, 1989). Those who have maintained their traditional food knowledge have continued to use it as the basis of their country’s cuisines and their culinary tourism products are continually successful. However due to globalisation, culinary knowledge and skill can change if not shared and used. This justifies the need to collect and use the indigenous culinary claims for cuisine distinctiveness. Furthermore, there is need for documentation, as the knowledge may be forgotten or distorted. Information distortion is as good as losing authenticity (Kwik, 2008). Documented information becomes a culinary product on its own, because information is availed to whoever wants it. (Moyo et al, 2016). The documentation facilitates continued exploration and enhancement of quality dishes

and cuisines. This overview is the basis for this section of the review and the call for indigenous culinary claims to be collected, validated and be part of the model for culinary tourism.

2.5.3 Indigenous culinary claims in nutrition and health

The knowledge and use of natural traditional foods and culinary claims also enhances the capacity to prepare meals that are nutritious. According to UNESCO (2005) research has supported dietary diversity that is promoted through many traditional diets as beneficial for nutrition. Today's tourist is health conscious, and is looking for healthy foods (Oktay & Sadikglu 2018). Most indigenous foods are natural and hence nutritious. This ensures healthy menu items which satisfy the health conscious tourist. For this reason, even those who are not culinary tourists may seek traditional cuisines for health reasons. Therefore, the use of culinary claims in assisting cuisine development may aid preparation and production of traditional cuisines.

Apart from indigenous foods being unique they present the world an opportunity for culinary tourism to offer tourists functional foods. Zsamoczky (2018) indicates that most functional foods were indigenous, a reference to them being more organic in nature. Further support for this assertion is found in Croatia where culinary tourism is looking into functional foods which also include vegetarian diets, ecological food, Mediterranean diets, macrobiotic foods and slow foods (Drpic & Vulkman, 2019). An example of Italy, a destination which is rich in a variety flavours, indigenous meals and traditions and their tourism has progressed as follows: 2012 (22%), 2014 (26%) and 2017 (29%) through the years. Their cuisines are of high quality, healthy and attractive. When looking into functional foods in cuisine development there is less use of processed foods and genetically modified foods. The production methods from farm to fork apply no or very little inorganic methods. Indigenous inorganic foods are promoted as opposed to organic foods. In culinary claims such aspects are emphasised, making them significant to specific indigenous cuisines.

2.5.4 Indigenous culinary claims' significance to current trends of cuisines

The most recent trend in cuisine development is molecular gastronomy. One of the aims of molecular gastronomy is to collect culinary claims for verification (Burke et al, 2016). The culinary claims are then analysed to determine their authenticity, with the information then used to develop and produce quality cuisines (TWT News, 2018). The cuisines produced (molecular cuisines) do not change the taste of the food, but only its colour and appearance (Prabodhani, 2018). A wide variety of cuisines are produced

through the introduction, and use of, science and technology without changing the authenticity of the cuisine.

The slow food cuisine is another style in cuisines development, which has its roots in indigenous culinary claims. The term ‘slow’ is used because the cuisine advocates for the preservation from extinction of indigenous foods, by slowing down the introduction of foreign foods, if ever they are to be introduced (Kwik, 2008). In fact, slow cuisine refers to a slow pace in the introduction of new forms of gastronomy. It opposes the standardisation of taste and the habits of unhealthy foods (Caporaso & Formisano, 2016). It protects cultural identity related to food and gastronomic traditions, preserves breeding and processing techniques and protects domestic, wild animal and plant species (Molmar, 2007). The fusion cuisine and modernistic cuisines are intercultural forms of cuisine developed from a variety of cultures. Their influence is mainly by globalisation and use of modern technology. These new trends and others also have their basis in indigenous culinary claims. The indigenous culinary knowledge becomes very important to preserve a country’s cultural heritage through its local food and food consumption patterns. Stone (2018) opines that economic opportunities currently in the ethnic food business are anchored on the popularity of culinary tourism.

Provision of local authentic cuisines has strengthened people’s connection to their heritage and identity through food, while also using food for practical and entrepreneurial benefits. In this context it can be argued that the promotion of culinary heritage encourages the establishment of independent and collective culinary initiatives that will eventually lead to the development of other forms of tourism like ‘rural tourism’ (Bessiere 1998; Mnguni & Giampiccoli, 2015). All this information argues for the use of local foods prepared in an authentic way. Examples of indigenous culinary claims are shared next.

2.5.5 Available indigenous culinary claims

There is a paucity of literature on the indigenous culinary claims, due to the fact that they have been shared orally within families or small communities. Similarly, traditional knowledge has always been kept a secret, from the perspective of preserving it, with no one considering that it would perish if not passed through generations. A few indigenous culinary claims are discussed in this section of the literature review. Most of the work is from the book *Food: A Cultural Culinary History Course Guide* by Ken Albata (2013). The culinary claims will be revealed through the foods used, food taboos and beliefs, fuel used, equipment used, cooking methods and techniques, presentation and consumption practices among other aspects. Literature

has revealed some claims from Zimbabwe, Africa- Egyptian, Uganda cuisines, Ethiopians, The Greeks, Australian aborigines and Chinese culinary claims.

First and foremost, culinary claims influence a cuisine by way of food taboos. In Zimbabwe there are specific foods that were not eaten by women and specific chicken cuts were not given to children. Another claim was that children should not be allowed to eat eggs (Muchinei & Hebert, 2018). The reason for discouraging children from eating eggs was that children, especially boys, are prone to hallucinating. A value is attached to this knowledge, through the so called 'African science' which may be taken as myths according to (Mapara, 2019). Scientifically the thinking is relevant because eggs have high biological value proteins, which are important for growth, therefore too much, may mean one having too many calories resulting in a child being overweight. Overweight babies have been known to have bouts. Many cultures in Africa did not eat eggs until recently and in Ethiopia and Southlands eating fish is a taboo. In Zimbabwe, and other African countries, one is not allowed to eat meats from animals or part of the animal that represent their totems. An example is that all those from the "moyo" totem do not eat the heart from any animal, even the birds.

In Africa the Egyptians, because of their distance from Europe, were one of those with a good culinary tourism industry because their cuisine, has included their indigenous ways of preparation (Chatibura, 2017). The European community influenced because of their nearness and it was cheaper for tourists to visit the destination. However, in most African cuisines they are made up of basically a starchy porridge made from any grain, tuber or starchy fruit. The use of grains such as sorghum, millet and rapoko was said to be sustainable, more nutritious, with high calories, less fat and more proteins (Jasińska, Charzyński & Świtoniak, 2017). The starchy powder is cooked in a pot to a solid mash that one can pick with hands and eat. In West Africa it is called *fufu*, and in Zimbabwe *sadza*. The starch porridge is eaten with a soupy stew prepared from goat or cow meat or poultry, which may be mixed with vegetables or vegetables alone with a little oil or peanut butter (Muchinei & Herbet, 2018). A point to note is that the basic structure of the African cuisine did not change much, besides that there is the use of new and more processed ingredients. The seasonings used include the *melagueta* peppers from West Africa and salt made from wood ashes, tamarind and kola nuts sliced into wedges and stewed for hours (Oktay& Sadikoglu, 2018; Zocchi & Fontefrancesco, 2020).

The first recipes were recorded in Egypt. The Egyptians loved meat and consumed a lot of wild game such as: ibex, gazelle, antelopes and they also consumed beef. According to Albata (2013) their recipes were simple in preparation, while they had a complex range of ingredients (Mantariari, 2000). During that time some claims were attached to religion, like not eating meat, because our forefathers, Adam and Eve ate only vegetables in the Garden of Eden. Another biblical belief was by those who observed Kosher, who were prohibited from what was called “boiling a kid in its mother’s milk”, which they related to “culinary adultery”. The kid in its mother’s milk represented milk being mixed with other foods and in most cases the other foods are salty. To them it simply meant milk, or any milk product, cannot be mixed in the same meal with salt (Albata, 2013).

Uganda was popular with dishes which would go well together: *matooke*: (a simple starchy banana which was steamed and mashed) and the *luwombo*: (banana leaves which were sold frozen in Asian groceries). The leaves served as the steaming container and as a serving plate (Albata, 2013). The practice of using leaves was also applied in Zimbabwe. During some gatherings, especially funerals, leaves were used to serve food. Though plate may be available at funerals, mourning crowds would not be expected to be in comfort, hence the decision to serve them on leaves. After all, there was no sauce served with the meat, as it was just boiled with nothing added except salt. In the recipe below the main culinary claims are underlined:

Use any kind of meat, but goat is richest. Cut up goat into large chunks, season with salt and pepper. Crush a few handfuls of peanuts into a fine powder and toss with the meat, sprinkle chilli flakes, chopped onion, grated ginger and a few chopped tomatoes. Place 2 or 3 leaves of bananas facing different directions. Put pile of meat on top and fold in the leaves to enclose. Tie securely. Cook in a pot with a little water on fire with three bricks. Firewood and smoke really does make a difference to the flavour. Steam for at least 2 hours. Cut open the bundles from the top folding down the leaves to create a kind of plate and eat directly from the leaf with some matooke on the side. Naturally you use your fingers of the right hand only(Albata, 2013).

The Greeks from the area of Galen of Perganum believed very much on the designing healthy meals. Therefore, they constructed a health meal using the system of humoral physiology of balancing hot, cold, moist and dry humors in a single dish, of which nutritionally rich foods would be included in one way or another (Albata, 2013; Angelopoulos, Schulp & Menezes, 2019). A common example was the use of

chickpeas flour cooked with milk. The health related claim was that chickpeas are less prone to flatulence and more nutritious and in addition serve as an aphrodisiac than other types of beans, (Albata, 2013; Thrasivoulos, Ifigenia, Kyriaki, Athina, Eleni, Xanthipi, Kyriakos, Xanthoula, and Efi, 2009). The recipe below explains how the healthiness of chickpeas is enhanced by the preparation and cooking specifications (Albata, 2013; Beer, 2010; Fox & Savarin, 2000; Partarakis, Kaplanidi, Doulgeraki, Karuzaki, Petraki, Metilli, Bartalesi, Adami, Meghini, and Zabulis, 2021).

Take 2 cups of chickpeas, soak overnight. The next morning, simmer gently in fresh water for about an hour. When beginning to get tender, add a teaspoon of salt, a dash of olive oil and some oregano. Continue to cook until completely cooked through. Sprinkle dry cheese finely pound and serve (Albata, 2013, p. 49).

The Greeks had another claim about peaches in relation to health. The name peaches was derived from its origin Persia, so were named *persika*. However, despite their lovely taste, it was believed that the juice and flesh of peaches easily corrupts the system, therefore they should not be eaten at the end of a meal (Albata, 2013; Partarakis, et al, 2021). They claimed that peaches float on the surface of the stomach, hence they are better served before a meal. Serving them before a meal was because they served as a lubricant, helping other foods down the digestive tract (Albata, 2013; Rouvelas, 2006).

The Japanese used a lot of rice (and even to this day), and they favour the short grain type which results in a sticky and relatively has a sweet taste when cooked. Therefore their cuisine is based on the tactile quality of rice, which sticks together and one can pick it up with a chop stick. In contrast the long grain cannot be eaten with a chop stick (Albata, 2013). They wanted rice in its natural state, therefore they never flavoured it and their rice was just boiled. They believed that any other food mixed with rice would corrupt it. Fish was eaten raw (the popular *sushi*), the method serving as a way to preserve fish for several years. It was prepared by having a bite size piece being salted and rolled with rice, flour, vinegar and left to cure (Albata, 2013). After it was preserved, the soured decomposed rice would be wiped off the fish then eaten. Sushi was served with vegetables, seaweeds as a side dish or an ingredient in dashi (Albata, 2013; Chefin, 2021).

According to culinary studies China has the longest and most complex culinary tradition on earth, which believes in the family and household as the basic unit of production (Tian, Tian, Dandan and Wang, 2018). Their household is extended with members of many generations living together and passing down cooking techniques from generation to generation (Albata, 2013; Tian, et al., 2018). Furthermore, there is obedience

to parents, respect for the elderly and even ancestors' worship, resulting in food customs and cooking techniques being passed down for centuries. Old ways are respected, therefore methods are changed infrequently over time (Albata, 2013; Tian et al., 2018). In addition, the Chinese were the first to season the pan to make it non-stick, since there were no non-stick pans of which the technique is still being used today, even for the non-sticky which have lost their non-stick properties (Albata, 2013). The method of making the wok non-stick is given below.

Seasoning A New wok

Heat New Wok for over an hour on a high flame of over an open until glowing red. Put on sturdy oven mitts and take a fist sized lump of pork fat or any animal fat and with a pair with a pair of tongs, swirl it around the interior of the wok and quickly remove it. This will create a layer of smoke. Repeat over and over again until you have a dark, shiny, sticky surface inside the wok. Care when using include: never use soap on this surface, after stir-frying put in sink while still hot, swirl around a cloth with tongs and hot water, drying thoroughly and wipe some oil to prevent rusting. You will be amazed how wonderfully food will cook on this surface without sticking (Albata, 2013, p. 63).

The Australian Aborigine used a simple method of cooking, using fire where meat was roasted in glowing amber (Zhou, 2015). Food was at times wrapped in leaves or bark to prevent burning. The food was cooked in a hole, heated with coal, or in a wooden trough filled with water and a hot rock thrown to do the cooking. The method was said to be flavourful and also resourceful as there were no poultry or meat implements (Albata, 2013).

There were some differences when the restaurants were introduced, their philosophy stressed, the natural, unaffected and less haphazard. Special attention was paid to size, shape, and the colour of bowls food is served in. Bowls chosen carefully to heighten the tactile and sensory quality of food and its perfect tone for them to be in different shapes and sizes unlike the Western culture (Albata, 2013). Food was well arranged on a plate to heighten attention to the different senses. Visual appeal was taken to be more important than in any other cuisine and it was achieved by careful attention to overall design, also to texture of the food in the mouth and to the aroma as it enters the nostrils. Unlike the Western model, their cuisines seemed to appreciate single ingredient on their own than complex combination of flavour and texture (Ma, 2015). Cooking techniques were very simple, where food was cooked for precise length of time over a stove top. There was very little use of methods like baking or roasting. Food was cut in small pieces so that it cooks

quickly and more evenly. Almost all foods were fried, grilled or steamed, with the methods regarded as flavour enhancing.

Specific rules apply in indigenous culinary claims; for instance, the removal of the clay pot when there is still some water. This demonstrates knowledge of carryover cooking. The materials used to make cooking equipment such as clay and iron pots retain heat much longer, unlike others in current use which lose heat faster. There is every need to leave the clay pot with some water or a sauce when removed from heat so that the pot does not boil out. (McGee, 2007; This, 2009).

The Japanese food was cut into bitesize pieces, or even larger. They preferred taking the food in entire mouthfuls at a time, as they also eat with their fingers, before the introduction of chop sticks from China (Albata, 2013). Even in China they also used to eat specific food types with their hands. Many people think eating with one's hands is inherently more pleasurable than using cutlery (Albata, 2013). The culinary claim is that when one is using cutlery one is distancing themselves from the food. Today eating using hands is viewed as unhygienic, especially when eating messy food. Albata (2013) gave an example of enjoyment brought by using hands when eating barbecue ribs. Furthermore, Albata (2013: 84) opines that "there is a strange satisfaction, perhaps primal in a Freudian sense of eating flesh this way". All these scholars justify the satisfaction and enjoyment brought by eating with hands.

In addition, with regards to using utensils to eat food, the Chinese did not use utensils, except for spoons to drink the soup. At times they did not even use spoons. Instead, they would use a flat bread to scoop up food including the soup. They also relate the way they eat to immediate tactile sensuality, and connection to the food is closer when eating with hands rather than using cold metal utensils (Albata 2013; Tian et al., 2018). Globally today, restaurants have resorted to warming plates and cutlery so that they can be used when they are not that cold. This is also a way of increasing both the tactile sensuality and connection to the food, according to this Muslim gastronomy (Albata 2013). This practise is still used today in Zimbabwe and most African countries by some cultures, especially when eating bony meats cooked by dry methods such as roasting or grilling.

Pap (*sadza*) prepared from mealie-meal is eaten using hands and generally shared from one plate, especially in rural areas (Muchinei & Hebert, 2018). Muslims also eat using hands, seated on a mat, with three fingers of the right hand. Furthermore, the Japanese did not use chairs, instead sitting on tatami mats or wooden floors. When seated on the mats they like drinking out of a bowl, forcing the diner to do everything slowly

and more methodically. For soupy/saucy foods, at times they would sip directly from the bowl, which were said to be more focused activities than eating liquids from a spoon (Houston, 2000). In Zimbabwe it is known as drinking the soup “*kunwa muto*”, an expression often signaling that one has enjoyed the food and really wants to consume everything down to the last drop.

Some of the interesting culinary traditions were that the head of the house eats alone, and that wives and slaves eat later. It was also taboo for men and women to eat together. In addition, a bit of the stew or beer was poured on the ground to feed the ancestors. They also stressed the importance of hand washing before eating, because everything was eaten using hands (Albata 2013). There were no individual plates, but eating was from a common bowl and everyone took food from it with hands. The significance was showing love for one another. Although they had alcohol, beer and fermented beverages, they stressed no drinking during a meal.

These are some of the claims of food and cuisine, which show the importance of these to cuisine authenticity and uniqueness within different groups of people or cultures. Claims validation and recording becomes an important element for them to serve the purpose they have served, resulting in cuisine authenticity being preserved. Validation will assist in distinguishing myths from true claims. Therefore, the next section will delve on molecular gastronomy, which is the science of cooking to be used to validate the indigenous culinary claims.

2.6. VALIDATION OF INDIGENOUS CULINARY CLAIMS USING MOLECULAR GASTRONOMY

2.6.1 History and background of molecular gastronomy

The use of scientific methods to understand food during the preparation and cooking process was started as far back as the 17th century by Lavoisier and Brilliant Savarin (Burke, 2007; This, 2006, 2005). According to Özgen (2017) two scientists, Nicholas Kurt and Herve This, were the ancestors of molecular gastronomy, though others also made significant contributions. The two took to the forefront the link between sciences and cooking, making observations that cooking was based on empirical traditions (Guler, 2016; Mc Gee, 2004; Ozgen, 2017). These empirical traditions required scientific study of the culinary process. Resultantly the science referred to as “molecular gastronomy” was developed to investigate culinary transformations, which food science did not look into. (Burke, 2007; This, 2006, 2005).

In 1969, Nicholas Kurt made a presentation entitled; “The Physicist in the Kitchen” for Royal Institute of Great Britain. He was motivated by the statement that: “while we can and do measure the temperature of Venus, we do not know what goes on inside our souffles” (Ozdogan, 2014; Mc, Gee, 2003). In addition to his great speech, Kurt also cooked a dessert called ‘Frozen Florida’ or ‘Baked Alaska’ with a cold ice cream outside and hot apricot marmalade inside (Osgen, 2017). The presentations were recorded by the British Broadcasting Corporation, and this popularised molecular gastronomy. In 1988, Molecular gastronomy was formalised by Nicholas Kurt and Herve This (Burke, 2016).

In the year 1992, the first International Workshop on Molecular and Physical Gastronomy was organised by Kurt and This at the Ettore Majorana Foundation and Centre for Scientific Culture in Erice, Italy (Fooladi, 2013). It was a platform for chefs and scientists to discuss and do demonstrations on molecular gastronomy topics. Such workshops were held every two to three years; (see Table 1). The workshops were on four major issues). a) To what extent is the science underlying cooking processes understood; b) whether the existing cooking methods could be improved by a better understanding of their scientific basics c) whether new methods or ingredients could improve the quality of the product or lead to innovations and d) whether processes developed for food processing and large scale catering could be adapted to domestic or restaurant kitchens (Cassi, 2011, p. 191). The workshops were also dedicated in memory of Nicholas Kurt (Özgen, 2017; This 2007).

While molecular gastronomy was in its inception, it is also interesting to note that the early days of molecular gastronomy coincided with the American Cultural Phenomenon, where The Food Network cable television station “The Food Network”, was launched in 1993 (Yek & Struwe, 2008). This also contributed to popularising the idea of food to the masses and it benefited molecular gastronomy by increasing its media. In 1995, Herve This had his first PhD in Molecular Gastronomy (Burke, 2007; This, 1996). Kurt and This conducted many programmes on the area, widening molecular gastronomy’s media coverage. Many chefs collaborated with This and Kurt in the programme.

Table 2.3 Themes for the International Workshop on Molecular Gastronomy

Conference	Conference Theme	Year
First Annual	(No theme announced)	1992
Second Annual	Sauces or Dishes Made from Them	1995
Third Annual	Heat in Cooking	1997
Fourth Annual	Food Flavours	1999
Fifth Annual	Texture of food: How to Create Them	2001
Sixth Annual	Interaction of Foods and Liquids	2004
Seventh Annual	Interaction of Food and Drinks	2006

From Jaime Friel Blanck (2007) *Molecular Gastronomy: Overview of a Controversial Food Science Discipline*,

Some of the chefs involved in molecular gastronomy and who attended the conferences include: Bernard Leprince, Michel Roth and Perre Herme from Paris; Ferran Adria from Rosa; Pierre Gagnaire who had restaurants in Paris, London, Tokyo and Hongkong; Heston Blumenthal in Bray. One very important event was a science and cooking event, where a menu was served by Pierre Gagnaire at the Academy of Science during a lecture. An online communication (www.pierre-gagnaire.com), was created and it had monthly contributions on molecular gastronomy (Burke, 2007; This, 2006). These contributed to rapid spread of the new technology. In France the field spread through seminars, national congress and courses and they repeated the Foundation ‘Food Science and Culture’ This, 2006 & 2007). Much had been done by then and some of the early researches which contributed in the development and research in on molecular gastronomy are highlighted in the next section.

2.6.2. Researches in Molecular gastronomy.

Scientists and Chefs were eager to know more about this new branch of food science and worked in kitchens and laboratories on various research. More publications on molecular gastronomy were made, with leading publications coming from the pioneers of this phenomenon, This, Kurt and Burham. On the list were Harold McGee who wrote *On Food and Cooking; The science and Lore of the kitchen*, 1984, *The curious cook*, 1990 and Peter Barham’s, *The Science of Cooking*, 2001.

Some of the early publications on molecular gastronomy include: *The Kitchen as Laboratory: Reflections on the Science of Food and Cooking*, edited by César Vega, Jos Ubbink, and Erik van der Linden (2012) shows molecular gastronomy's state of art. In his texts This (2002) was of the opinion that some of the information in culinary books was not that accurate, affecting the product results and quality. Furthermore, there was the argument by molecular gastronomists that there was no perfection in any specific recipe, so recipes always need to be looked into time after time (Burke, 2016; Vartiainen et al., 2011). This claim seems not only credible, but is one of the major motivations for this study. It is worth revisiting these recipes, ways and methods for the customer who has new demands of knowledge of the product they are consuming. Hence this study sought to assess the Zimbabwe's indigenous ways of cooking through their culinary claims. Further the study used molecular gastronomy to validate these claims for authenticity and health, which would go a long way in providing quality cuisine for Zimbabwe's culinary tourism.

The University of Denmark had the first PhD students in Molecular gastronomy, with their studies offering proof of the significance of this field to the world of food and cooking. (Risbo, Mouritsen, Frøst, Evans, & Reade, 2013). Snitkjaer Nielson studied the fundamental problems of reduction of meat stocks with and without the addition of wine (Snitkjaer, 2010). The research addressed the process of intensifying the flavour of a stock by boiling off water, also inevitably drives off volatile aromatic components along with the steam. It was concluded that stock reduction was a continuous change of flavours due to loss of some volatile components and the chemical generation of others. The balance between these two main processes can be shifted by the power input from the stove, and a fast reduction rate was found to give a stock that has less volatile and a sensory profile that more resembles a less reduced stock (Snitkjaer, 2010). Snitkjaer Nielson's work was appreciated and findings are still being used even today in stock preparation and the sensory profile for stocks suitable for different foods and dishes. The use of neutral stock which is left to boil for a short time at high temperature or low temperature for a long period to expose it to "continuous reduction," thus weakening the flavour, that stock's suitability in lightly flavoured soups and dishes and in dishes whose food cannot be used for stock preparation.

Lois Morch Mortensen addressed the new possibilities of low temperature sus-vide cooking of beef with special emphasis on time and temperature as the parameters used by the chef to achieve the desired results (Frost & Mortensen, 2011). The results concluded that there is a fast-toughening process which is promoted by temperature and a slow softening process mainly promoted by time. As a result of these two conflicting

types of behaviour, the chef cannot compensate for lower temperature by longer times (or vice versa), because different culinary results will be obtained (Frost & Mortensen, 2011). Flavour pairing studies were done, whose results showed some degree of intensity suppression of flavour when some foods are paired (Frost & Mortensen, 2011). Above all molecular gastronomy is about all passionate feeling associated with food and eating, the senses, chemistry behind colour of food, effects of food production techniques on flavour, texture, food as a colloidal system, principles of cooking methods, the enjoyment and pleasure of eating.

More comprehensive research on the effects of cooking methods has been carried out (Özdoğan, 2014). According to Mc Gee (2004) it was an era to “melt cooking and science in the same pot and direct cooking into academic and industrial science.” Prior research in the middle of the 18th century looked into home cooking of potatoes by Antoine Augustin Parmentier (2010), while the chemical properties of fats were studied by Eugene Chevreul (This, 2002). All these developments and studies paved the way for development of molecular gastronomy. Upon these developments, Nicholas Kurt a physicist was described as a food lover at the University of Oxford (Mc Gee, 2004; Vega & Ubbink, 2008).

Herve This worked on the soufflé recipe, which required the addition of eggs two by two. He added all eggs at once and the soufflé did not rise (This, 2009, p 14). He collected more culinary precisions with more than 25 000 recipes that are still being tested to prove their reliability (This, 2009, 2006). Harold Mc Gee was another important player in molecular gastronomy research. He published his book *On food and Cooking* in 1984, whose contents are on the scientific understanding of cooking (Vega & Ubbink, 2008). The next section of this review is going to answer the question in order to understand the scope of molecular gastronomy.

5.6.3 What is molecular gastronomy doing to our cooking?

The argument that any phenomena needing an explanation and can be explained by the natural laws of physics, chemistry and other sciences led to the introduction of the science of molecular gastronomy in the year 1988 (Guler, 2019; This & Routledge 2009). According to Burke (2016) and Burke, This and Kelly (2016), molecular gastronomy aims to determine the physical and chemical mechanisms involved in preparation and cooking of food. Resultantly, the kitchen became a laboratory for the chef and scientist (This, 2011; This & Rutledge, 2009). Food science covered food and its use in the industry, nutrients and food safety, leaving out cooking as it was considered an art (Burke, 2016; This, 2007). Molecular

gastronomy was developed to cater for that gap, after discovering that besides being an art cooking as a science. For the chef the scientific exploration of cooking is important as science and technology developed. Cooking should be explored scientifically because science is the basis for technology and innovation. The knowledge acquired helps to create new dishes and improving existing ones. Molecular gastronomy covers all aspects of science, with the history and sociology of food and cuisine being revealed in the indigenous culinary claims. The biology is how and what the food does and how the customer is satisfied. Molecular gastronomy aims to create more healthy cuisine, which is more attractive (Cousin, 2010, This, 2007). The result is that guests are delighted and excited with tasty and healthy food (Cousin, 2010). The phenomenon emphasises being able to cook better, through understanding of the sciences underpinning cooking.

Examples of aspect underpinning cooking include the causes of (the rise of a soufflé, softening of carrots during cooking, or change of colour of vegetables) (Guler, 2019). There was need to understand these processes and explain them, thus preventing mistakes made by some theories. The theory that the browning of steak cooked in a pan is due to caramelisation, yet it is actually due to Maillard reaction between amino acids, carbohydrates and other reactions is an example of such theories which should be understood. These were some of the processes which molecular gastronomy sought to explore, for perfection of all recipes using scientific methods of investigation (Caporaso & Formisano, 2016), thereby solving the identified problem of “Recipe perfection” of recipes.

Besides, food science not considering cooking as a science, as it had been perceived as relating to art than a technique (Mcgee, 2013). The other side of the story was that food also lacked commercial interest (Burke, This, & Kelly, 2016). Molecular gastronomy would help produce products of commercial interest locally and abroad, thereby assisting in marketing destinations. The justification for molecular gastronomy was the use of science to study the cooking process and covering all aspects of food as a basic and social need. Phenomena such as melting, emulsion, droplet size and water/fat solubility can be taken under scope of the research (Fooladi & Hopia, 2013). The modern kitchen has become a meeting place where chefs, who are normally characterised by their artistry, creativity, and craft, can interact with scientists who are normally characterised by their empiricism, rationality and adherence to the scientific method (Trynor, 2013; Van de Linden, 2008).

2.6.4 The harmony of food and science

The question now is how molecular gastronomy brought harmony to the two groups of professionals. Mc Gee (2004) describes molecular gastronomy as the science of deliciousness and Peter Barham, a polymer physicist, noted the interdisciplinary nature of the new science of food. The old-wives' tales regarding in food preparing or cooking have traditionally guided the food preparation process. In France for instance, it is said that women ought to be prohibited from making mayonnaise during menstrual cycles, otherwise the sauce fails (This, 2002). In Turkey, it was similarly said pregnant women should not touch raw meat. All these traditional applications need a multidisciplinary approach: based on chemistry, physics, biology, history, and sociology in order to be proved (This, 2002).

Testing of all recipes or practices is actually the core scope of molecular gastronomy (This and Rutledge, 2009), since one of the most important roles of the molecular gastronomy is to assess culinary myths (Caporaso & Farmisano, 2016). As a result, the scope of the molecular gastronomy can be summed up as threefold; (a) scientific exploration of culinary definitions, (b) rigorous testing of culinary precisions and (c) scientific exploration of the artistic and social aspects of cooking (Burke, This & Kelly, 2016, p. 1).

From the definition given earlier the term molecular gastronomy is encompassing of food preparation, its enjoyment and the body's physiological benefits. Molecular gastronomy encompasses three fields: technical, artistic and social (Burke, 2016; Lumat, 2013). The technical aims to explore the scientific, artistic and social phenomena and processes behind recipes. The artistic, defines the aesthetic of food, while the social links exploration of food and those who consume it, why, how and where it is consumed (Lumat, 2013; This, 2009). Many researchers have addressed the artistic and social aspects, with the social aspect being dealt with in food anthropology. The three aspects technical, artistic and social cannot be separated and they are all covered by molecular gastronomy. Through an in-depth analysis of definitions of molecular and gastronomy and technical, artistic and social, the three aspects are covered as explained in the next paragraph.

The definition given by Klosse (2013, p. 71) which states that "gastronomy is the science of flavour and tasting," addresses the art and social aspects. He further describes flavour as what edible products 'the food' has 'its flavour' and 'the taste'. Tasting is what people (not animals) do. He emphasised that gastronomy focuses, not solely on food and beverages and their composition, but on the human being that consumes

them as well. In this instance gastronomy does not address the cooking of the food consumed, but the enjoyment of the cooked food by the person eating.

The cooking of the food is not gastronomy according to (Klosse, 2013). Guler (2019) clarifies the meaning of gastronomy by showing that cooking is different from it by indicating that cooking is the preparation of food, while gastronomy relates to man nourishing himself. In this scenario cooking is addressed by molecular, which is the technical aspect. Molecular is representing food molecules which are reactive during the cooking processes as defined earlier in the chapter, resulting in the flavour and taste which is enjoyed by the customer. When the two words combine “molecular” and “gastronomy” the three aspects are addressed. The effects of gastronomic properties during cooking determine the difference in taste results, with different individuals and groups having different choices. At the same time cooking techniques are varied, so that different food tastes are achieved to cater for the different likes and dislikes, p. 72kes. Variety and uniqueness is also achieved through these techniques using different and specific foods. Gastronomy is especially interested in why this human being likes the things he eats or drinks (Guler, 2019; Klosse, 2013). However, the why is answered by the cooking process as that is when the gastronomic properties are affected.

Molecular gastronomy has closed the science gap by explaining what will be happening to the food molecules during the cooking process. This research is using molecular gastronomy to address the gap where indigenous culinary claims remain claims until they are validated or verified by science. After validating then each claim will have an explanation. Zimbabwe’s cuisine can go a long way in providing a brand to the tourism industry if the culinary claims are explored and validated, a key goal of molecular gastronomy. The goals are highlighted in the next section of this review.

2.6.5 The Goal of Molecular Gastronomy

This (2003 and 2009) states that science has impacted a lot on livelihoods, though it has had little change on cooking habits. This is apt, since most regions of the globe still have their traditional traits in their food and cooking styles, even for the colonised and colonisers who have preserved their own traditions. This led to the molecular gastronomist This outlining five goals from his Phd on molecular gastronomy, which he later changed to four (Burke, 2016; Mc Gee (2013). (See Table.2). The goals show the interdisciplinary nature of molecular gastronomy. Three were science related, while two focus on application and education aspects of molecular gastronomy (Schenkelaars, et al., 2010; Yek & Struwe, 2013). Coporaso and

Farmisono, (2016. p, 418) identify three goals of molecular gastronomy as follows: Goal number (1) one states that all phenomena need explanation, which is demonstrated by examples such as: the clarity on the rise in soufflé, softening of carrots, change in colour of vegetables or the thickening of sauces. Phenomena need precise explanation. Goal number (2) two was to verify old wives' tales about cooking. Such old wives' tales include the aforementioned French claim on the preparation of mayonnaise by menstruating women. Another example sees how pregnant Turkish women not being allowed to touch raw meat. This study adopted This's first and second goals and the second from those refined, and apply it to Zimbabwe's to come up with authentic and unique cuisines for culinary tourism development.

Table 2. 4: Goals of molecular gastronomy.

	This's M.G. Goals	This's redefined M.G. Goals
	To collect and Investigate Old wives' tales about cooking	To study recipes, cooking habits and cooking wisdom.
2	To model and scrutinise existing recipes.	To explain the chemical and physical processes that takes place during cooking.
3	To introduce new tools, products and methods of cooking.	To use the knowledge about the physical and chemical processes of cooking to develop new cooking instruments and ingredients.
4	To invent new dishes using knowledge from the first 3 goals.	To develop and invent new dishes with the help of the acquired knowledge about food and cooking processes
5	To use the appeal of food to promote science.	

Adopted from (Mc Gee, 2003).

The researchers should explore and understand what is done in order to get answers to food preparation and the cooking process. Goal number two is process oriented, with the aim being to solve the problem of recipe perfection. The methods are assessed, where the myths are known, thrown away while the truths are upheld. Errors can then be corrected and new dishes developed, which is the thrust of molecular gastronomy. The study follows almost the same steps followed by documentation of results. However, most of the works by these molecular gastronomists, were not published. Literature available is indication that most of the culinary claims are awaiting scientific validation.

The kitchen stories are being referred as: “indigenous culinary claims”, the term which denotes tradition and authenticity (This & Rutledge, 2009). The study objective four assesses the validity of indigenous culinary claims, which includes recipe scrutiny at the same time assessing myths. Process validation uses the physics and chemistry of food and other sciences. Phenomena explanation is from the science of food. The information about the cuisine is known and can be availed to the customer who demands information about the food they consume. Food researchers have found that traditional food and the culinary traditions have not been a guarantee for healthy food, thus the need for this scientific intervention. Every product and activity will have an explanation (This, 2013) whereby healthy diets can be planned to cater for nutrition related problems.

2.6.6 Developments in molecular gastronomy

Molecular gastronomy was first developed in Europe, but is still considered a new science currently (McGee, 2007). During the last decade, knowledge of food science and technology has been applied to Haute Cuisine, obtaining great benefits (McGee, 2013). The same author further indicates that the most important chefs in the world are keen on gaining knowledge about the physical and chemical changes to food after any culinary process, and the art of combining different flavours in order to obtain both new flavours and textures. This could allow chefs to develop new processes and hence gain a competitive advantage in restaurants. Sensory analysis can be another tool to develop new products for restaurants, in particular new desserts. This is because consumer response to the sensory properties of food (particularly appearance, flavour, aroma, taste and texture) is an important factor in determining the success of new and existing products (This 2013). All these methods use the science of molecular gastronomy, which this study is advocating for.

Gastronomy has been understood by some authors as a holistic concept and relates to societal issues of nourishing the elderly and school children in the hospitality industry where people pay for the food. It is fundamental that people will enjoy what they bought (Clanak, 2015). In the meantime, great chefs discovered how science can help them make dishes more enjoyable and spectacular. Ferran Adrià (restaurant: El Bulli, Rosas, Spain), Heston Blumenthal (restaurant: The Fat Duck, Bray, UK), and René Redzepi (restaurant: Noma, Copenhagen, Denmark), among others, are modern chefs that popularised the use of science to the centre stage of world gastronomy.

2.6.7 Frameworks in molecular gastronomy

Molecular gastronomy has observed that every cook has struggled to find the methods those guarantee a perfect outcome for a specific recipe (Blanck & Blanck, 2008). Following that observation was the struggle to find ways to perfect all recipes using scientific methods of investigation, hence the coming in of molecular gastronomy. In molecular gastronomy, recipes can be divided into definitions and precisions (Blank, 2007; Burke, This & Kelly, 2016). The definition of a recipe consists of materials and methods, which are the cooking protocol. It is the technical part and is that which leads to the production of the food (Burke, This & Kelly, 2016, p. 2). Burke, This and Kelly (2016) went on to give the example of marmalade, its definition being slices of oranges, plus sugar, plus heat. Literature has not explained where the quantities fit, but the researcher is of the opinion that ingredient quantities are part of the definition.

The culinary precisions are all the technical additions such as the instruction that one has to cook until a drop of the liquid forms a gel on a cold plate. It also includes how to process the ingredients, blending, mixing, washing and cutting. The precisions provide information on quality measures and degree of 'doneness.' An example is that some say that strawberries should not be washed, as that makes them lose their flavour. These bring uniqueness to a dish as they are bound to differ depending on one's taste. Precisions can also include any other technical hint which enhances uniqueness of a dish. Burke, This and Kelly (2016) identified a third part of a recipe, which spells out information which is not a matter of technique but has an artistic and social dimension. In the example of marmalade, the fineness of the shredding of the slices determines the success of the marmalade. The specific detail in the precisions is fundamental for dish quality.

Precisions have further been divided into those that are related to ingredients Precisions Related to Ingredients (PRI) and those related to operations or procedures Precisions Related to Operations (PRO) Burke & Danaher (2018); This, 2006b). Looking at a recipe, the researcher sees the ingredients being the definition of a recipe in particular a standardised recipe with number of servings. The methods section carries all the culinary precisions. When molecular gastronomy explores these recipes both the definition and the precisions are scrutinised, as each part depends on the other.

2.6.8 Application of molecular gastronomy

The framework on how the cook and the scientist look at food, was adopted to explain how molecular gastronomy is applied. The cook and the scientist are explained how they perceive the cooking process. The cook is anyone who prepares food and, in this study, ‘the indigenous woman’ is the cook. In both perspectives food is the starting point which is the ingredient, which consists of specific components (see-Figure 2.2). Each food component has its own physical and chemical characteristics which contribute to the functionality of the ingredient (Mc Gee, 2013; Schenkelaars., *et al*, 2010; Wijaya, Mehla & Wijaya, 2015). The components, water, carbohydrates, proteins, fats and air have food molecules which are reactive because of their different structures (Mc Gee, 2013; Schenkelaars., *et al*, 2010). The scientist explains the reactivity as caused by molecules in food, while the cook just cooks knowing the food will cook, soften and develop a specific taste, without an explanation of how it really happens. The components within the food affect the sensory quality of food products produced, so an understanding of these so called ‘functional properties’ is essential. This means and calls for the cook and the scientist to meet and agree because they are talking about the same things which are the changes occurring during cooking. However, the only difference is that they are using different languages. Both sides are aiming at bringing out a specific taste of the product, which is the flavour. Therefore, the Flavour theory was chosen as the overarching theory for this study.

The Flavour theory as states that there are flavour compounds shared by culinary ingredients (Spence, 2016; Ahn, 2014). Flavour compounds (chemical) profiles of the culinary ingredient are the natural starting point for a systematic search for a principle that may underline the choice of acceptable combinations. This statement supports that the choice of foods available for use determines the cuisine produced, that is its taste and flavour. Figure 2.2 shows the framework for molecular gastronomy from the cook and the scientist perspectives.

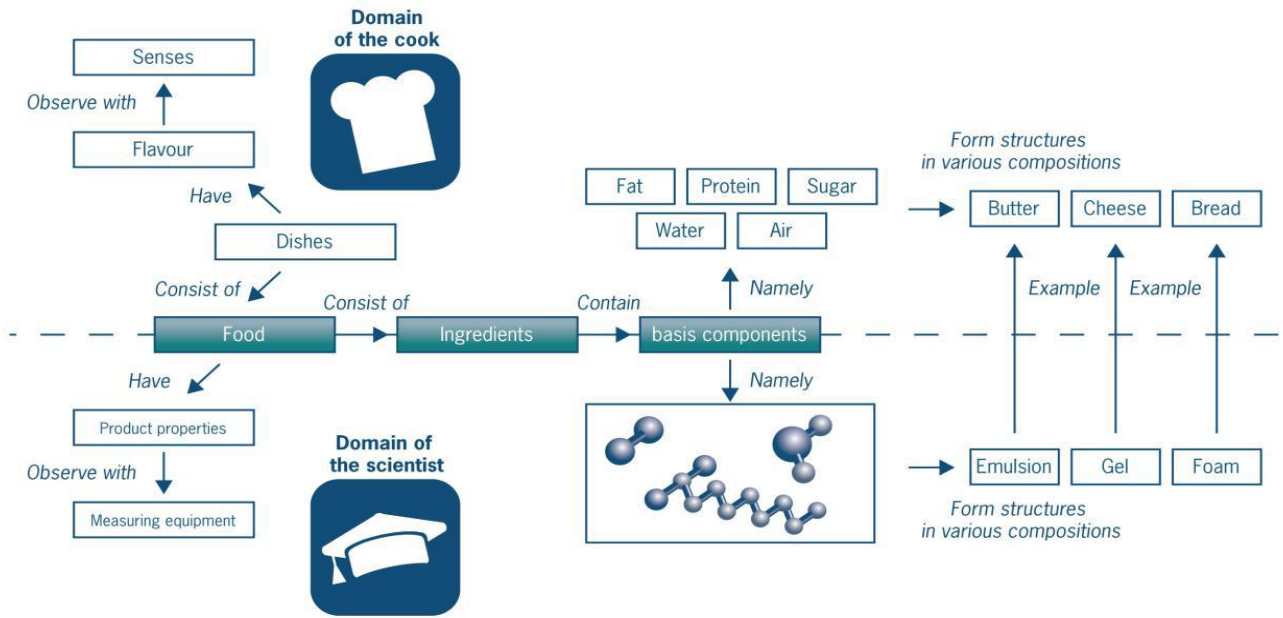


Figure 2.2: How the cook and the scientist look at food. Adopted from Schenkelaars, et al., 2010, p. 4

2.6.9 The basic components of food

All food consists of any or all of the 5 components, which are: water, carbohydrates, fats, proteins and air (Mc Gee, 2013). The characteristics of these components and the mutual interaction between them determine the product characteristics of the food (Mc Gee, 2013; Schenkelaars et al, 2010). An understanding of the characteristics of each of these components is key to understanding how to combine specific foods coming up with recipes and resultantly cuisines (Wijaya, Mehla & Wijaya, 2015). Water is the major component because all foods have a certain amount of water. The food component will be explained in relation to how they react in food preparation and cooking process. These processes are important in this study in understanding what actually happens for food to be cooked as expected for cuisine quality. The same information is also fulfilling the aim of the study: the validity of the indigenous culinary claim.

2.6.9.1 Water

Water consists of small molecules with a strong mutual attraction. The molecules are two hydrogen atoms and one oxygen atom (H₂O), which make a water molecule. The hydrogen molecules are connected by covalent bonds (sharing of pairs of electrons) to the oxygen atoms. These hydrogen bonds create a

particularly strong bond between the water molecules. Due to these strong bonds, water has the following characteristics (Mac Gee, 2004; Schenkelaars et al, 2010; Wijaya, Mehla & Wijaya, 2015).

- Water has a high melting point. Without hydrogen bonds the melting point would be -100°C and the boiling point -80°C .
- Water has a high latent heat evaporation point (= the amount of energy absorbed without a corresponding rise in temperature).
- Ice is the only solid to float in its own liquid.

Some of the water molecules are hydrophilic, that meaning they (dissolve easily in water), while others have difficulty dissolving in water (hydrophobic). Fats are an example of those hydrophobic molecules. ats are an example of those hydrophobic molecules. Therefore, substances that easily form hydrogen bonds dissolve well in water, making this the basic characteristic of water which is useful in the food preparation process.

The other components carbohydrates, proteins, fats and air have the ability to dissolve, thicken and stabilise and belong to colloids. Proteins, fats and air have other characteristic such as disperse systems, emulsifiers, emulsions, foams and gelling properties. The next section will cover some of these aspects.

2.6.9.2 Carbohydrates

Carbohydrates are some of the most important ingredients in foods and nutritionally, they were the first to be discovered (Dutson and Oraett, 2021; Kerley, Winkel, Davidek and Blank, 2010). They are found in large amounts in grains, sugar, fruits, vegetables and fiber, while meat and fish contain carbohydrates in small amounts, making them insignificant to be carbohydrate sources. Carbohydrates have a reducing characteristic (Yong et al, 2019). In their structure, the difference on the positions of oxygen and hydrogen around the ring, giving their differences in solubility, sweetness, rate of fermentation by microorganisms, and other properties of these sugars (Schenkelaars, et al., 2010; Va der Linden, 2010).

Carbohydrats are classified according to their simplicity, as nonosaccharide, disaccharide and polysaccharides. The complex ones are the polysaccharide and they can be broken down into simple sugars by hydrolysis. The breaking down can be assisted by acids or specific enzymes, which act as biological catalysts, therefore the use of acids in cooking. Such catalysts are in microorganisms, germinating grain,

animals and humans Among the polysaccharides starch is the most important in cooking, because of its chemical properties. It is also one of the most well-known polysaccharides, consisting of between 200 to 200 00 glucose molecules, and is present in grain, roots, bulbs and vegetables (Va der Linden, 2010, p. 42). The key characteristic of starch is its ability to thicken products (Shewfelt, 2009; Va der Linden, 2010).

Starches from plant origin are generally used in food. They occur in tubers forming the characteristic starch granules (GNU, 2017). Their properties are generally the opposite of sugars, though both give energy. Starches are not sweet, that is why they are sometimes referred as non-sweet sugars. The GNU (2017) explained further that they are not readily soluble in cold water forming pastes and gels in hot water. This is when starch granules taking up water, swelling, gelatinising, thus increasing viscosity, forming a paste and a gel on cooling (GNU, 2017). The viscosity gives the thickening characteristic. They are used to thicken foods and starch gels used in puddings (Izydorczyk, 2005). The viscosity impacts the “mouthfeel” of a product providing textural cues perceived by the somatosensory system.

The simple and double sugars have the same characteristics. However, the characteristics only vary in degrees (Herrero, et al., 2008). These include being sweet, soluble in water, therefore form syrup and crystals when water is evaporated from their solutions, meaning that all monosaccharide are reducing sugars (Schenkelaars, et al., 2010; Va der Linden, 2010). The disaccharide maltose is a reducing sugar, while sucrose is a non-reducing sugar. Compounds that affect the colour, flavour and reactive properties with other foods like amino acids are formed (Potter & Hotchkiss, 1998). Because of their ability to darken colour (caramelise), they can combine with protein as brown reaction to give dark colour. They also give body and mouth feels to solutions in addition to sweetness (Shewfelt, 2009). According to Hosoney (1994), glucose in the blood is a ready source of energy for animals, so referred as the ‘blood sugar.’

2.6.9.2.1 Carbohydrates and the process of cooking.

The properties of sugars and starches have significance in the cooking process. Two major changes occur when carbohydrates are heated, that is caramelisation and gelatinisation. This reaction is as a result of the oxidation of sugar when dry heat is applied above 110°C. (Dutson & Oraett, 2021; Yong, et al, 2021). The process yields volatile compounds resulting in reducing sugars reacting with the amino acid lysine (deMan, 1999). The reaction is called maillard reaction. This is the browning reaction that is experienced when food is heated during baking, roasting, or frying. This reaction plays a predominant role in flavour development

during the cooking of food, especially those involving proteins and starches (deMan, 1999; Yong, et al, 2021). Flavour compounds generated impart desirable sweet, brown, roasted, toasted, and nutty aromas (Schenkelaars, Klompmaker & Ties van de Laar, 2010; Smith & Hui, 2004). As these reactions involve both carbohydrates and proteins, not much is going to be explained on the proteins section,

Gelatinisation occurs to starches when they absorb water and swell (GNU, 2017; Smith & Hui, 2004). Gelatinisation is used in cooked sauces, bread and other baked goods. Flour added to liquid in sauces and gravies is gelatinisation. On the contrary, when dry heat is applied to starches, they turn brown and that is called dextrinisation (deMan, 1999, pp. 177-178). Starch is then turned to dextrins. These dextrines are simpler and more soluble. Toasted bread and browned flour for roux are examples of the uses of dextrinisation in cooking, where flavour and colour are developed (Smith & Hui, 2004).

2.6.9.3 Proteins

Proteins are the major food molecule and they are different from the fats and carbohydrates in that they are most challenging and mercurial (Mc Gee, 2004). Furthermore, proteins are described as not that stable, because when exposed to a little heat, acid, salt or air, their behaviour changes drastically, while fats and carbohydrates are pretty stable and staid. These characteristic reflects on their functions, which are unique to them (Kokkinidou, et al; Mc Gee, 2004; Yong et al, 2019). Proteins are nutritionally the active machinery of life, as they are responsible for cell formation and transport in the body system. Good sources of protein include meats, fish, dairy foods, beans, nuts and legumes (Shewfelt, 2009).

Protein are made up of amino acids. Some amino acid are soluble in lipids and not in water (hydrophobic), while others are soluble in water and not in lipids (hydrophilic). Examples of foods which have different water absorption capacities (hence different solubility) include the wheat proteins that form gluten when flour is mixed with water absorbs considerable amounts of water but do not dissolve This is because the fat-like groups bond with each other holding the proteins together excluding water molecules.

Protein denaturation is a complicated process that basically involves breaking down long chains of amino acids, which make up proteins, into smaller pieces, less complex chains (Dtson and Oraett, 2021). This occurs by heating and excess pH that is acid or alkali, or bases and also by physical agitation, such as stirring. For instance, when one scrambles an egg, they are breaking some of the chemical bonds that hold the egg together, essentially changing its structure (Dtson and Oraett, 2021). Protein also become attracted

to each other and bond. This bonding is called coagulation, which forms a solid network of bonds and become firm. Coagulated food develops a thickness that is delicate and at the same time delightful. Set custard and a perfectly cooked fish are examples (Mc Gee, 2004). These shows that denaturation and coagulation happen simultaneously so cannot be separated (Mc Gee, 2004; Tyagi, et al., 2015). In increased temperatures and denaturation causes proteins to shrink, become firmer and lose moisture. Excess heat toughens them, resulting in them drying. The process is completed mostly at 160°–185°F (71°–85°C), meaning that the extent of the changes cause by the two processes depends on the temperature and time of treatment (Abraha, et al., 2018; Dutson & Oraett, 2021; Mc Gee 2004)

Enzymes are specialised proteins that catalyse specific reactions. The human digestive system depends on enzymes for breaking down food to their soluble form. To the cook they are important as they contribute to food texture and consistency (GNU, 2017; Mc Gee, 2004; Shewfelt, 2009). Enzymes matter to the cook because foods contain enzymes that once did important work for the plant or animal when it was alive, but that can now harm the food by changing its colour, texture, taste, or nutritiousness (Field, 2012; Mc Gee, 2004). Enzymes help turn green chlorophyll in vegetables dull olive, cause cut fruits to turn brown and oxidise their vitamin C, and turn fish flesh mushy. And bacterial spoilage is largely a matter of bacterial enzymes breaking the food down for the bacteria's own use. With a few exceptions, such as the tenderising of meat by its own internal enzymes, the firming of some vegetables before further cooking and fermentations in general (GNU, 2017; Field, 2012; Mc Gee, 2004) enzymes are detrimental in cookery. So, The cook wants to prevent enzymatic activity in food. This results in the storage of foods at low temperatures temperature to delays spoilage in part because it slows the growth of spoilage microbes, but also because it slows the activity of the food's own enzymes (GNU, 2017; Field, 2012; Mc Gee, 2004).

2.6.9.3.1. Proteins and the process of cooking

Although heating a food product that contains protein causes several structural changes to the protein and the linkages between proteins, the nutritional value of the food does not change. According to Cornell University, when *casein* and *whey* (two types of protein found in dairy) are heated, no changes result in the digestibility or nutritional content of the protein than before it was heated (Davis, 2015; Kokkinidou, et al, 2018; Schewfelt, 2012). However according to Field (2012), Maillard reactions makes amino acids in proteins unusable as protein building blocks, although to a small extent. Many protein foods such as meat contain small amounts of carbohydrates, therefore when heated at about 310°F (154°C), the protein react

with the carbohydrates molecules and undergo a complex chemical reaction. The Maillard reaction involves destroying some of the food enzymes that were active prior to heating. The result is that food turns brown and develop richer flavours, as can be seen most often in the browning of beef and steak when cooked (deMan, 1999).

However, over cooking or high temperature will denature proteins found in food. It is possible to controls denaturation and that can be done by controlling the temperature. The fat and air content can be controlled when one is beating proteins (Abraha et al, 2018; deMan, 1999). In general, the best rule is to heat foods as rapidly as possible, thereby minimising the period during which the enzymes are at their optimum temperatures, and to get them all the way to the boiling point. Conversely, desirable enzyme action like meat tenderising, for example, which can be maximised by slow, gradual heating to denaturing temperatures is necessary (Mc Gee, 2004; Tyagi, 2015). The choice of cooking method for specific food types is of importance to prevent any undesirable changes and enhance the desired ones, resulting in quality food production.

Amino acids and peptides contribute to flavour of the food in three ways. Three aspects of amino acids are especially important to the cook. First, amino acids participate in the browning reactions that generate flavour at high cooking temperatures. Second, many single amino acids and short peptides have tastes of their own, and in foods where proteins have been partly broken down, they help to age cheeses, cure hams, and in soy sauce these tastes can contribute to the overall flavour. Most tasty amino acids are either sweet or bitter to some degree, and a number of peptides are also bitter. However glutamic acid, better known in its concentrated commercial form MSG (monosodium glutamate), and some peptides have a unique taste that is designated by such words as *savoury*, *brothy*, and *umami* (Japanese for “delicious”). They lend an added dimension of flavour to foods that are rich in them, including tomatoes and certain seaweeds and salt-cured and fermented products. When heated, sulphur-containing amino acids break down and contribute to egg, meaty aromas.

Finally, there are many effects that proteins have on food and cooking such as stabilising foams and emulsions to forming up gels (deMan, 1999). However, knowing more about proteins will help one understand, design, modify recipes and fix things areas which may not give the best results.

2.6.9.4 Fats

Fats generally refer to those in solid form, while oils are those in liquid form (Mc Gee, 2004; Provost, et al, 2016). Schenkelaars et al., 2010). In the kitchen, fats are quite valuable as they provide flavour and a pleasurable smoothness. In addition, they provide some degree of tenderness to food. Above all they are a cooking medium that allows food to be heated well without being burnt, preventing drying out, hence providing a crisp texture and rich flavour (Field, 2012; Mc Gee, 2004). Fats are found in meats, poultry, fish, eggs, milk products, nuts, whole grains, and in small amounts in vegetables and fruits. .

Fats are sometimes divided into visible and invisible fats or as animal and vegetable fats (deMan, 1999; Mc Gee, 2004). The visible fats are those which are about 40% fat, which include butter, margarine, lard, cooking oils, while the invisible is that fat contained in food such as dairy products (excluding butter), eggs, meat, poultry, fish, vegetables and grain (deMan, 1999; Provost et al., 2016). The sequence of atoms makes the carbon chain not dissolve in water making them “hydrophobic” or “water hating” (Schenkelaars et al., 2010)The unique characteristic of fats (that they do not mix with water) enables them to form boundaries or membranes around tiny oil droplets. According to Mc Gee (2004), lipids share two other characteristics, one is their clingy, viscous, oily consistency.

The chemical definition of fats is that they are chemical compounds that are solid in organic solvents and not soluble in soluble water (GNU, 2017). Fats have a clingy viscosity which provides a moist, rich quality to many foods, and their high boiling point makes them an ideal cooking medium for the production of intense browning-reaction flavors (Mc Gee, 2004; Wajay &Wajay, 2015).

Unsaturated and specifically polyunsaturated fats tend to be oils and are not readily spread on bread (Mc Gee, 2004). Products with a lot of saturated fats tend to be solid at room temperature, while products containing unsaturated fats, which include monounsaturated and polyunsaturated fats, tend to be liquid at room temperature (Provost, et al, 2016). Predominantly saturated fats (solid at room temperature) include all animal fats (e.g., milk fat, lard, tallow), and palm oil, coconut oil, cocoa fat and hydrogenated vegetable oil (shortening) (Wajay & Wajay, 2015, p. 8). All other vegetable fats, such as those coming from olive, peanut, maize (corn oil), cottonseed, sunflower, safflower, and soybean, are predominantly unsaturated and remain liquid at room temperature. Some oils (such as olive oil) contain in majority monounsaturated fats, while others present quite a high percentage of polyunsaturated fats (sunflower, rape). However, both

vegetable and animal fats contain saturated and unsaturated fats (Schenkelaars et al., 2010; Smith & Hui, 2004).

Saturated fats are also more stable, slower to become rancid than unsaturated fats (Mc Gee, 2004; Provos et al., 2016).. Consequently, the more unsaturated the fatty acid, the more prone to rancidity. MC Gee (2004) indicates that foods have different saturations. Beef fat is more saturated than pork and chicken, so has a better shelf life than chicken.

2.6.9.4.1 Fats and the cooking process

Most fats do not have sharply defined melting points. Instead, they soften gradually over a broad temperature range. As the temperature rises, the different kinds of fat molecules melt at different points and slowly weaken the whole structure (Mc Gee, 2004). Most fats begin to decompose at temperatures well below their boiling points and may even spontaneously ignite on the stovetop if their fumes come into contact with the gas flame (Provost, et al., 2016). This limits the maximum useful temperature of cooking fats. The characteristic temperature at which a fat breaks down into visible gaseous products is called the *smoke point* (Wajay &Wajay, 2015, p. 9).

2.6.9.5 Emulsifiers: phospholipids, lecithin, monoglycerides

Some very useful chemical relatives of the true fats, the triglycerides, are the diglycerides and monoglycerides (Mc Gee, 2004). These molecules act as *emulsifiers* to make fine, cream-like mixtures of fat and water, such as mayonnaise and hollandaise sauces, because fats even though fat and water do not normally mix with each other (Wajay &Wajay, 2015, p. 10). The most prominent natural emulsifiers are the diglyceride, the *phospholipids* in egg yolks, the most abundant of which is *lecithin* (it makes up about a third of the yolk lipids). When the cook whisks some fat into a water-based liquid that contains emulsifiers' "oils into egg yolks" the fat forms tiny droplets that would normally coalesce and separate again (Wajay &Wajay, 2015). However, the emulsifier tails become dissolved in the droplets and the electrically charged heads project from the droplets and shield the droplets from each other stabilize the emulsion of fat droplets.

In summary during the cooking process all these reactions explained in the preceding sections occur. They occur under different conditions and in specific foods because of the nature of the food components which have been highlighted and discussed. The result is a product which has a specific quality. The major characteristic being the flavour which has been developed in the process. This makes the main theory for this study the Flavour theory, which is going to be discussed next together with other related theories.

2.7 THEORETICAL UNDERPINNINGS FOR THE STUDY

2.7.1 Introduction

In research theories provide an explanation of reality by explaining how and why things work the way they do (Ngulube, 2018; Cresswell, 2013). The relationship between concepts is explained to clarify the meaning of a phenomenon under study (Collin and Hussey, 2014; Cooper & Meadow, 2016). This study is guided by the Flavour theory, the flavour experience theory, the experiential theory and the stakeholder theory. The overarching theory is the Flavour theory as the validation of indigenous culinary claims is closely linked to food flavours. On the other hand, the Flavour Experience theory assists with claims validation, specifically the sensory evaluation aspects. Culinary tourists, tourism players and the indigenous people are the stakeholders who determine the cuisine quality provided, through agreeing on the cuisines that have been provided. All stakeholders play a significant part in the success or failure of culinary tourism in the destination. The theories related to this study are illustrated in figure 2.3 below to show their relationship.

2.7.2 Flavour theory

The Flavour theory development grew from studies conducted by Dr. Cramwinckel of Wageningen University in 1989 (Kloss, 2017; Spence & Wang, 2019). While Heisenberg (1927) had his part on the discovery of the flavour theory, Dr. Cramwinckel's experiments were mainly on wine taste (Kloss, 2017). He examined what makes a wine taste differently and to determine which wines combine with which foods. The discovery of the theory challenged the existing paradigms about flavour, as it assessed objectively how people reacted to flavour when they eat food (Spence, 2017).

In the Flavour theory, the combination of tastes and tactical sensitivity and the visual and auditory site when tasting food are scientifically described. Previously food, eating and enjoyment did not address the process of change in food and continuity, and all knowledge relied on history (Sulton, 2014). The content of a recipe tells the history and culture of those who use it, missing out the enjoyment part of food. Knowledge was

limited until the discovery of the Flavour theory, which enhanced the tricks and specifics of food combinations and cuisines. There was better understanding of the flavours of new brands of food, food products, and unfamiliar foods (Blake, 2006; Spence, 2017). This theory gave an insight in the composition of dishes and a structure for developing and improving them.

The experiment by Dr. Cramwinckel came up with what he called “Universal flavour factors.” These help to describe the flavour of wine, mayo, fried chips, soft drinks, milk, meat, fish, fruits and vegetables. In fact, anything’s flavour can be described and therefore can be distinguished. These factors are mouth feel and flavour intensity (Kloss, 2015, 2017; Schenkelaars et al, 2010). Mouth feel refers to the feeling of flavour in the mouth as distinguished by contrasting, coating and dry. Flavour intensity is the force of flavour which is determined by sensory threshold. Sensory threshold is determined by the concentration of a specific ingredient in a dish (Spence & Wang, 2019; Wang, 2019).

Furthermore, the Flavour theory states that there are flavour compounds shared by culinary ingredients (Ahn, 2014; Spence, 2016). Flavour compounds (chemical) profile of the culinary ingredient is the natural starting point for a systematic search for a principle that may underline the choice of acceptable combinations. The hypothesis which has been used by scientists and chefs is that “ingredients sharing flavour compounds are more likely to taste well together than ingredients that do not” (Flavor Network, 2016. p. 2). This knowledge is used to search for novel ingredient combinations. Chocolate and caviar share trimethylamine and other flavour compounds, while chocolate and blue cheese shares at least 73 flavour compounds. Other ingredients may not be combined for flavour, but other reasons, such as stability, a characteristic of eggs (This, 2013; McGee, 2004). Also of importance is the mode of preparation which owes much to the choice of ingredient, and the ingredients to the mode of preparation.

The Flavour theory also states that the number of ingredients in a recipe owes a lot to its flavour. Understanding how to combine and balance flavours is an important cooking concept and it has been evident in the Asian cuisine (Dong, 2015). Asian cuisine such as the Chinese, Thai, Vietnamese and Japanese are enjoyed by many people (Dong, 2015). There is a cultural diversity of culinary practices, leading to a variety of cuisines (Ahn, et al, 2014). This has resulted from the combinations used in food to come up with those individual and different tastes. Therefore, the recipes used in food preparation and the culinary practices determine the flavour from how and when the combinations of ingredients are done. This brings the difference in cuisines, even where the same ingredients are used. The essence of gastronomy is to understand the flavour of food, which should be applied during food preparation and cooking. Through

the Flavour theory there is the understanding of deliciousness, uniqueness and authenticity of cuisine. Hence, the flavour theory from this content, suggests specific criteria for acceptable combinations, 1) similar flavour compounds, 2) ingredient stability, 3) mode of preparation, 4) number of ingredients.

In this study the phenomena which were explained by the Flavour theory are indigenous culinary claims, molecular gastronomy and culinary tourism. The key to this study is the indigenous culinary claims which are traditional theory and opinion, which have remained unquestioned. The study used molecular gastronomy in which the Flavour theory is embedded to question the culinary claims. The indigenous culinary claims are explained by the cuisine type, uniqueness and its authenticity which is identified by its flavour. An understanding of the flavour compounds would assist in studying the indigenous culinary claims. As the various foods are being combined, the claims unveil and distinct flavours will be developed which brings the uniqueness to the cuisines of the different regions and Zimbabwe as a destination.

2.7.3 Flavour Experience theory

Smith, (2012) explains flavour as the experience of eating food mediated through all senses. Flavour is the sensory impression of food and drink in the mouth, which is determined by taste and smell (Wang, 2019). According to Lingle (2017) tasting is a sensory activity to register flavour. Human beings use senses to create an expectation of what a flavour of food before they consume the food, regardless of expectations determine one's decision to buy a specific food or not. This includes what one is used to and what one has tasted before. These expectations determine one's decision to buy a specific food product. These senses include sight and orthonasal olfaction (Lingle, 2017; Sawada et al, 2017). The saying "Eat with your eyes" (Spence et al., 2010) applies, because sight is first and the expectation is confirmed when the food is put in the mouth by taste (gustation) and retro-nasal olfaction. Colour creates correct or incorrect expectations of a flavour. The correct is called "congruent", while the incorrect is "incongruent" (Kloss, 2017). Colour offers the food characteristic such as the aesthetic, safety, sensory characteristics and the acceptability of food.

This theory was applicable to his study as the cuisines are what individuals or groups have chosen to consume through exposure to them through upbringing, visiting places or what has attracted them. The saying that "the proof of the pudding is in the eating" explains the flavour experience theory. Cuisine tasting is the way one can explain, express enjoyment, satisfaction or otherwise. Tourists visit places to experience food and cuisine. Similarly, there are some who may not want to taste new foods, which they have not

experienced, such as those who suffer from food neophobia. Therefore, the study of cuisine and consumption patterns assists a destination in providing for most of its visitors.

2.7.4 Experiential theory

The theory of experience ‘Experiential theory’ has been applied to culinary tourism concept by (Mark, Lumber & Eve, 2012). The theory states that eating is a unique form of touristic activity that gratifies all five senses: vision, tactical, auditory, taste and olfactory (Kivela and Crotts, 2006). In this study tourists visit to consume the Zimbabwe’s indigenous food and cuisines, through which they experience the destination’s culture. Repeat visits can only come from a positive experience. A satisfied visitors will also talk about the destination and more visitors can come for that experience.

2.7.5 Stakeholder theory

Freeman (2004) defined stakeholders as those groups who are vital to survival or success of cooperation. These groups or individuals have the ability to influence whatever activities (Savage et al, 1991). These stakeholders may be external or internal. Internal stakeholders are individuals or groups in the organisation itself or within the event, including staff, volunteers and owners. External stakeholders are those outside the organisation or event and include the community, suppliers, supporters, partners and the public at large. Stakeholder theory provides a vehicle for connecting ethics and strategy (Phillips, 2003). It has been connected to the idea of strategy, originally to make policies and business policy and strategy more effective. The serving of interests of groups of stakeholders will create more value over time. (Campbell, 1997; Freeman, 1984; Freeman, Harrison and Wicks, 2009). Creation of value is important to all stakeholders. They want to benefit from what is happening around them or what they are involved in. It is also important to involve them so that they feel their significance and are more involved. A perspective by Smith (2017) is that all stakeholders are “customers.”

For the tourism industry’s survival, the tourist is the key stakeholder whose needs and wants should be catered for by a destination. When tourists visit they need food, even those whose motivation to travel is not food (Smith, n.d.). It is important to make a needs analysis, thus the first and second objectives of this study surveying the nature of culinary tourism in Zimbabwe and the extent of consumption of indigenous cuisines.

The indigenous people want to guard their cuisine, it is important to consider how they feel about their cuisine and show appreciation. They should be involved in providing cuisines to those who visit through taking visitors to village homes so that they experience the cuisine. The community' knowledge is also quite valuable and makes a significant contribution to Zimbabwe's culinary tourism development.

2. 8 Conclusion

This chapter sought to establish the aspects which are in the study on indigenous culinary claims and molecular gastronomy in order to develop a model for culinary tourism. It provided the information to show the nature of culinary tourism in the global world, so as to provide an argument on the need to spruce up cuisine development using indigenous culinary claims. Culinary tourism has become popular globally, where culture is experienced through local food experiences. Destinations have taken it upon themselves to produce authentic and unique cuisines through using their local foods. For cuisine authenticity they have maintained their indigenous methods of preparation and cooking, therefore they have managed to retain their flavours. The indigenous culinary claims have been used within their restaurants to maintain their food taste. The research gap has also been revealed. While these destinations are using this indigenous knowledge in their cuisines, not much of that knowledge is documented. In order for that documentation to be done, there is need for validation to be done through molecular gastronomy which is the new trend in cuisine development, where science meets the chef in the kitchen. The model for culinary tourism should include this validation of claims for cuisine authenticity and information on the product, which today's customers are seeking.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology that was adopted to assess the validity of Zimbabwe's indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism. The study was guided by the following main research objective: To assess the validity of indigenous culinary claims through molecular gastronomy for the development of culinary tourism in Zimbabwe. Specifically, this chapter presents the research philosophy, the design, target population, sample size, sampling methods, research instruments, and data collection procedures. It also explains the data analysis methods which were used, the presentation methods, research instruments and data reliability and validity and the ethical considerations which were adhered to during the study and after. The study used a mixed methodology approach because the data was both qualitative and quantitative in nature.

3.2 Research philosophy

A philosophy is a world view brought to the study which is based on the set of assumptions, values and practices informing decisions on the methods for research (Birks, 2019; Cresswell, 2014; Khaldi, 2017). Philosophies guide research action and They shape how the research problem and research questions are formulated, which in turn guides the search for information to answer the research questions (Lynham, & Guba, 2011; Mertens, 2010). Dudovsky (2018) underscores that results generated in a study depend on the philosophical approach adopted. Precisely, the nature of the study guides the philosophy, and Creswell and Creswell (2017) opine that research philosophies are imperative in research.

As research philosophies encompass assumption of how researchers view the world and thus develop knowledge, the ontology and epistemology are the basic orientations. The ontology justifies the existence of nature, that is the 'nature of reality' (Cresswell and Poth, 2018; Richie et al, 2013). An ontological assumption is about how researchers think the world functions, and each one is committed to specific views (Cresswell & Poth, 2018). In this study, the indigenous culinary claims, were the society's lived experiences of their cultural heritage. Similarly, the epistemology assumption is about life related knowledge which is known and shared, answering what, how and why (Chilisa & Kawulich, 2012). This philosophy, therefore,

applies on the validation of indigenous claims to answer, the what, how and why of cooking. The epistemology assumption was relevant to further explain the shared knowledge about food and cooking procedure, which the study focused on. There are two schools of epistemological thought, positivism and interpretivism. Other philosophers have settled for a combination of the two, which is: pragmatism, and is the one relevant for this study. It is important to clearly define the philosophies used in research in order to justify the researcher's preference for pragmatism (Cresswell, 2018).

3.2.1 Positivism

Positivism is a philosophy based on the belief that "factual" information is received only by observation based on the senses, including measurement, so is quantitative in nature (Littlejohn & Foss, 2019). Ramsberg (2018) describes it as a deductive approach to the natural sciences and it involves objective observation of some assurances, understanding the cause and effect by examining the relationship between two specific variables (Apuke, 2017). Similarly, the positivist philosophy was applied in this study to validate the indigenous culinary claims, where senses and measurement were used to understand the causes and effect of specific conditions for quality cuisines. There was need to look at the relationship between variables using statistics, in order to look at the relationships between variables using pairwise comparisons and experiments to assess statistical data.

3.2.2 Interpretivism

According to Gannan et al. (2021), interpretivism is a view that social scientists are interested in, and they use the philosophy to get an in depth understanding of human beings. Interpretivists' believe that complex understanding is built from humans where meaning is generated (Creswell, 2018), considering human interaction to be rich in meaning and knowledge (Bryman, 2015; Creswell, 2013; Reiners, 2012). It is usually employed in qualitative research and targets small sample sizes where there is a lot of interaction with the researcher. Therefore, the interpretivist approach was used for this study, because the exploration of indigenous culinary claims required the use of in-depth interviews with the elderly women. This enabled the researcher to understand the secrets behind the claims about, the food preparation and cooking processes. Many variables are involved in the food preparation processes and procedures, and they required in depth explanation in the process of gathering meaningful and objective evidence about the claims. Therefore, in synthesis, the pragmatic philosophy was applied in this study.

3.2.3 Pragmatism

The approach supports work that combines quantitative and qualitative methods as it redirects researcher's focus on methods rather than metaphysical concerns Doyle, Brady & Bryne, (2009). Therefore, the pragmatic philosophy was thus suitable for this study. Fundamentally, pragmatism is a philosophy which enjoys re-formulating methods and principles to solve concrete social problems (Kalolo, 2015). This study also required the use of many methods to cover the three major areas, which were key in meeting the research thrust. There was need to use what worked best in order to seek answers to the research question and what enables solutions to the problems as supported by (Brierley, 2017; Manus, Mulhall, Ragab & Arisha, 2017; Shannon & Baker, 2015). There was need to have a deep syncretism of different concepts and approaches, to create harmony among the science and nature, so that they understand each other.

The first phase of the study looked at culinary tourism, its nature and indigenous cuisine consumption, where the questions were both in structured and unstructured form allowing for quantified views to be justified. In order to understand the indigenous knowledge on culinary claims (social sciences), it was important to accept the existence of reality that individuals have many ways of interpreting this reality (Maarouf, 2019). This thinking was therefore, used so that responses were given through quantifying and qualifying them. Finally, claims validation was done using scientific methods, using specialised respondents and tools and under special conditions. Pragmatism enabled this research to be approached in a holistic approach. This justifies its choice in this study which involved a critical analysis of the validity of Zimbabwe's indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism.

3.3 Research design

Research designs are types of inquiry within the qualitative, quantitative and mixed approaches for collecting, analysing, interpreting and reporting data in the research study (Boru, 2018; Cresswell, 2014). A research design sets the procedures on the required data, which will answer the research question (Boru, 2018, Grey, 2014). It is actually a framework to gather valid data (Jilcha, 2019). There are three major research strategies in the research designs which are exploratory, descriptive and causal. This study used the survey, exploratory, descriptive, and experimental and observation designs which are explained and justified in the following sections.

3.3.1 Survey

A survey is usually used in quantitative studies with large samples to determine the relationship between variables (Creswell, 2013). It provides a quantitative or numeric description of trends, attitudes or opinion of a study sample of that population where findings are generalised (Fowler, 2008). In rare cases a survey would be used to collect qualitative data and is known as ‘qualitative survey’ and can be used for qualitative data, to complement the quantitative data with closed and open-ended questionnaires. A survey was conducted using a survey questionnaire which had both open-ended and close-ended questions. Data were collected from the supply side ‘industry’ and demand side ‘tourists’ using a total of 148 respondents, to establish the nature of culinary tourism and the extent of indigenous cuisine consumption. The nature of culinary tourism and extent of cuisine consumption required the quantified data to be justified through word narratives. The method facilitated mixing and linking of data. Similarly, using closed-ended and open-ended questionnaires enabled the study to develop a precise and holistic picture of the nature of culinary tourism in Zimbabwe and the consumption patterns of indigenous cuisines by tourists. Concurrent mixed methodology was used, because the questionnaires used had two sections, A and B covering the nature of culinary tourism in Zimbabwe and extent of indigenous cuisine consumption by tourists respectively. Furthermore, the data collected did not affect each other. The surveys population were also from the same areas, so it was possible to collect the data concurrently, in order to cover the two objectives.

3.3.2 Exploratory research

Exploratory research is conducted when not much is known about a phenomenon and the problem that has not been clearly defined or is vague (Saunders et al., 2007). It does not provide answers, but merely explores the topic. It tackles the problem initially for the study, with the objective of discovering future research tasks (Boru, 2018). The idea is to develop a hypothesis or questions for future research. What was explained by these researchers is quite applicable to this study, because the explored culinary claims had their answers only after the validation process. The exploratory design was chosen for this study because the exploration of indigenous culinary claims attempts to discover new and interesting information about the Zimbabwe indigenous cuisines through the process, as supported by (Swedberg, 2018). Through exploring indigenous culinary claims using in-depth interviews, clear insights were developed. The insights were required to bring out authenticity into the Zimbabwe’s indigenous cuisines for culinary tourism to thrive in the destination. Operational definitions were developed, establishing the priority areas of concern. Besides the

in-depth interviews, observations and audios were taken to triangulate so that no data is missed, and for verification.

3.3.3 Descriptive research

The purpose of descriptive study is to provide a picture of a situation, person or event or show how things or events and how the processes are related to each other (Boru, 2018). Descriptive research design helps provide answers to questions of “what” and others such as “who,” “when,” “where” and the “how” associated with a particular problem (Cresswell, 2014; Savelli & Mateus, 2019). It may not give an answer to “why,” but is used to obtain information concerning the current status of phenomena and to describe what exists with respect to variables or conditions in a situation.

The study used the descriptive design for the quantitative survey data, and the sensory evaluation experiments, which followed after the exploration of the culinary claims. The validation of indigenous culinary claims where the scientific and experimental approaches are both new areas as alluded to by (Boru, 2018). Its other suitability lies in its ability to discover the association among different variables as the sensory evaluations were performed to examine the effects of the cooking process on the quality of a cuisine, specifically the collected indigenous culinary claims. In addition, the survey on the nature of culinary tourism and extent of consumption of indigenous cuisines used the same design for some of the closed ended questions, which explored the frequencies of use and consumption of culinary tourism products in the destination.

3.3.4 Experimental design

The experimental design uses systematic planned research done with purpose (Cresswell, 2014; Onwwuegbuzzie et al., 2014). In most cases, this kind of research design is used in cases where an area of study is characterised by an absence or limited number of studies. Focus is on gaining insights and familiarity for later investigation. The validation of Zimbabwe indigenous culinary claims through sensory evaluation was a new area, hence the need to determine the authenticity of claims made by the indigenous elderly people. Results from experiments were done to bring forth insights on how best to proceed in studying the indigenous culinary claims. Relationships were studied and influences were determined, as supported by (Loewen and Plonsky, 2016). This study used the factorial design which is useful where more than one variable is involved and the culinary claims have many “variables”, which are the “factors.”

These many factors in the food preparation process are responsible for specific taste and flavours of cuisines produced. In this study the factors were identified from the culinary claims, which were then examined to determine their combined interactive effect (Zalbidea, 2018). They were examined to determine their causal relationship in a specific cuisine for their characteristic quality. Sensory evaluations were specifically done to answer the hypothesis from the analysis of indigenous culinary claims. However, when the experiments were done, both descriptive statistics and qualitative descriptions (words), rated on the hedonic scale to describe cuisine quality, were applied to describe the cuisine quality aspects (Alavi, Archibald McMaster, Lopez & Cleary, 2018).

3.3.5 Observational design

Observation allowed for triangulation of data Cresswell (2013), Halcomb and Hickman (2015), through observing the process of preparing, cooking and serving food and an in-depth understanding of the “what,” “how” and “when.” During the validation process observation was used to establish the process change which gives the end products. Useful insights were derived from the phenomena. It allowed room for dialogue. According to (Cresswell and Clarke, 2016; Swedberg, 2018), the designs used in the study were both from quantitative and qualitative methods. Figure 4.1 shows the mixed methodology framework used

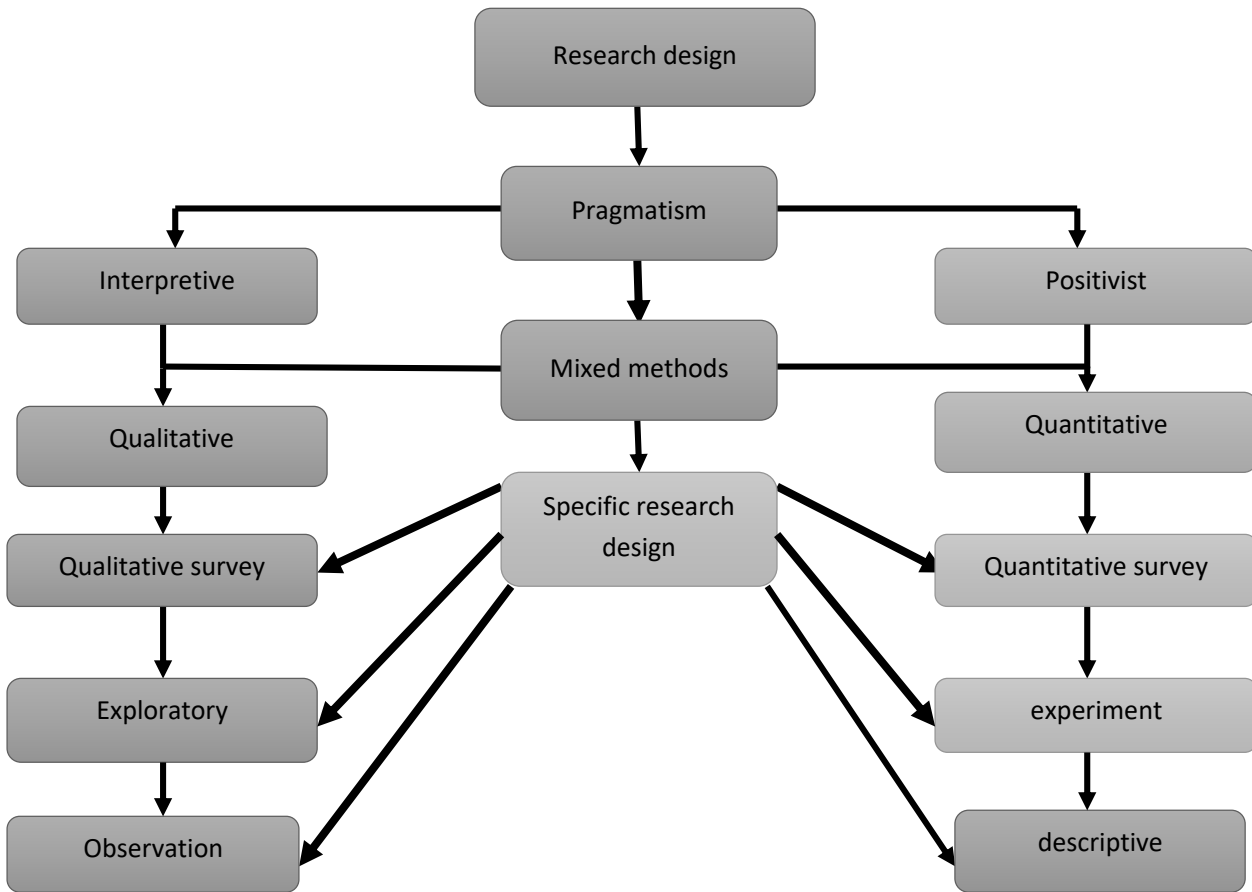


Figure 3:1 Author's compilation: Mixed method design framework used for the study.

3.4 Methodological approach

Research methodology involves the intersection of the philosophy, the research design and the specific methods for a systematic approach in carrying out the research study from beginning to end (Turner, Cardinal, & Burton, 2017; Creswell & Plano Clarke, 2011; Howel, 2013). The three research approaches are qualitative, quantitative and mixed methods (Creswell & Clark, 2017). The mixed methodology were used to examine the nature both textural and scientific data which were used. The mixed method gave a full and more accurate picture of the research problem in this study, enabling the investigations to capture the complexity of human phenomena and respond to the interests and needs of tourists as supported by (Doyle, Brady and Byrne, 2009).

The study used both open-ended and close-ended inquiry to gather data from tourists and hoteliers. In this study the indigenous culinary claims were explored using in depth interviews, while the validation required

statistical methods of inquiry. While this methodology was suitable for this study, it has its problems. The use of this mixed methodology made the study long, many resources were also used, and it required the intervention of many parties. Despite the above limitations, mixed methods research triangulates one set of results with another thereby enhancing the validity of inferences and allowing mutual confirmation, which this study required (Molina-Azorin *et al.*, 2018).

The findings were used to generate data for the third phase where an assay was conducted on the indigenous culinary claims (quantitative) using molecular gastronomy. The key variables for scientific verification were identified. In this phase, the researcher built on the results of the qualitative data quantitatively (deductive, empirical). In the process of coming up with authentic cuisines from the collected indigenous culinary claims, it was important to come up with the relationship between various gastronomic variables. The relationship between variables would answer: “what,” “where” and “when” of the preparation and cooking of the indigenous ways and methods of cooking food. Experiments for food tests using molecular gastronomy through dish tasting for sensory evaluation constituted the quantitative methodology aspect as the data was scientific in nature. The quantitative method evaluated evidence of explored data through experiments based on a theory or hypothesis. Therefore, the process variables’ relationship was tested in this study to determine cuisine authenticity, from the indigenous people’s claims. The two methodologies were mixed throughout the study in order to develop concepts, building statements and developing theories. The next section explains how the mixed methodology was employed.

3.4.1 Mixed research methodology models.

Since research is a systematic way of gathering and analysing data, some models for applying mixed methodology have been suggested. Zhang and Creswell, (2017) suggest three models of mixing the qualitative and quantitative methods: sequential mixed procedures, concurrent mixed methods and transformative mixed methods. Table 2. below shows how the models and designs were used in this study together with the methodologies and designs

Table 3.1 Mixed methodology designs for the study.

Stage	Objective	Research design/methodology	Design Typology
1	1 and 2	Qualitative and quantitative survey	Concurrent convergent
2	3	Exploratory qualitative	Sequential exploratory
3	4	Experimental, descriptive and observation qualitative.	Sequential descriptive
4	5	Connecting data while merging results from stage 2 and 3 for model development	Sequential transformative

Source: Researcher's compilation.

This study started by carrying out tourist and industry surveys in order to collect qualitative and quantitative data at the same time (concurrent mixed method). Data were collected at the same time because it had equal weight and were analysed separately and integrated at the level of overall interpretation. The next set of data used the convergent parallel mixed method to obtain different but complementary data. This was the scenario in answering objectives one and two, where both open-ended and closed-ended questions were used. The nature of culinary tourism and extent of indigenous cuisine consumption by tourists was understood holistically (Creswell, 2014; Rodrigues, Correia & Kozak, 2016; Zhou, 2019). In this approach quantitative and qualitative data were collected concurrently and given equal weight and analysed separately and integrated at the level of overall interpretation

The next set of data used the exploratory sequential mixed methods. According to this study, this model was the main design model because the major data was collected and analysis done at this stage. The indigenous culinary claims were explored to satisfy objective 3, analysed and results used to formulate the study hypothesis for claims validation. Validation of indigenous culinary claims was possible only after indigenous culinary claims were collected and analysed.

The last phase consolidated the two sets of data from tested culinary claims and molecular gastronomy theory, which was the sequential transformative typology phase (Alavi et al, 2019). According to Creswell (2014) and Walliman (2011) the sequential transformative typology phase is a design that helps unearth deeper knowledge into a particular phenomenon. Therefore, the validation revealed the actual effects of the cuisine preparation process effects, in order to determine the truths and myths of claims, for cuisine authenticity. The study aims at coming up with a model, which was derived mainly from findings from the last two stages of data collected. The study used grounded theory as the methodological theoretical lens.

3.5. Study methodological theoretical approach: grounded theory

Grounded theory was discovered by sociologists Glaser and Strauss in 1967, and later many versions were developed (Cresswel 2014). The discovery of grounded theory aimed at developing an alternative approach to scientific or systematic inquiry aimed at discovering or generating theory from data collected in the field. Similarly, the systematic inquiry methodology, set to discover the indigenous culinary claims for Zimbabwe's cuisine, aims to discover and construct theory from data to be used for coming up with what was tested by scientific inquiry. Furthermore, the grounded theory is based on the thinking that much of the world is socially constructed (Walsh, 2015). It explains that studying the world requires an approach that captures the organisational experience in terms that are adequate at the levels of first meaning for the people living that experience and second social scientific meaning about that experience (Birks & Mills, 2015). This statement matches very well with this study, collecting indigenous culinary claims which are based on the lived experiences and validations done.

Furthermore, the grounded theory is suitable where little is known about the phenomenon. It relies on many methods and is regarded a rigorous method (Birth & Mills, 2015). With the rapid expansion of the contemporary mixed methods movement, grounded theory has been used across disciplines and several scholars have focused on making explicit the potential of grounded theory for mixed methodology. Of relevance to this study is that the grounded theory principles include: constant comparative method to develop concepts and categories applied throughout all phases of analysis, simultaneous data collection and analysis, theoretical sampling to help guide the elaboration of categories and relationships, writing, and theoretical saturation and constructing codes and categories from data rather than from preconceived hypotheses, and developing theory from data. In this study, the indigenous cuisines were prepared using

methods that brought the unique flavour specific to a community. Broader theories were then generated through the data from the mixed methods.

3.6 Study population

The first group of the target population were the domestic and international tourists and the hospitality industry. The study considered both supply side and demand side of culinary tourism to establish the nature of, and assess the extent to which, indigenous cuisines were being consumed by tourists in Zimbabwe. This covered objectives one and two. Specifically, the supply side of the study consisted of senior chefs, and food and beverages managers in Zimbabwe hotels and restaurants for the supply side. Srivastava and Thomson (2009) argue that a social phenomenon cannot be understood outside its own context, thus the use of those involved in consumption and supply of indigenous cuisine products and services. Using both the supply side and the demand side gave a holistic approach towards establishing the nature and extent of culinary tourism in Zimbabwe. The population was obtained from 3 to 5-star hotels, restaurants and independent restaurants in Victoria Falls and Harare.

The population for the third objective of the study, which, sought to explore the indigenous culinary claims were the elderly women from rural communities from two provinces in Zimbabwe. The two provinces were used with the assumption that each region has its own unique indigenous culinary claims, which can be used to come up with a holistic picture of the claims related to the Zimbabwe’s indigenous culinary claims. The key informants being elderly women (60 years and above) assumed to have the indigenous knowledge on the way food is prepared and cooked and why it was the way it was as they were exposed to traditional Zimbabwean cuisine. To fulfil the forth objective, eighty (80) respondents form Chinhoyi University (CUT) Fod Science students, conteen staff and academic staff from hospitality and tourism domain were considered as the panellists for the validation of indigenous culinary claims

Table3.2 Study area and population

Objective	Narration	Study area	Population
1	Nature of culinary tourism in Zimbabwe	Victoria Falls and Harare	Chefs Domestic and international tourists

2.	Extent of cuisine consumption by tourists.	Victoria Falls and Harare	Hospitality industry Domestic and international tourists
3.	Exploration of indigenous culinary claims	Masvingo- Zaka district Mashonaland West- Hurungwe district	Elderly women
4.	Validation of claims	Chinhoyi University of Technology	Students studying Food Science courses, Academic staff in the Hospitality and tourism domain and Canteen staff.

3.7 Study area

Study setting is a social, physical and experimental context where data is going to be collected (Mlambo, 2019). Victoria Falls and Harare were considered for the tourist and hospitality industry for data collection. The areas were chosen for their high concentration of tourists, hotels and restaurants. Harare was chosen due to its proximity to Chinhoyi University of Technology where the study was coordinated from. Two provinces were selected for the collection of indigenous culinary claims, Masvingo Province (Zaka district) and Mashonaland West Province (Hurungwe district). These districts were chosen because of their rich culinary heritage, which can give a good representation of the Zimbabwe's indigenous cuisines.

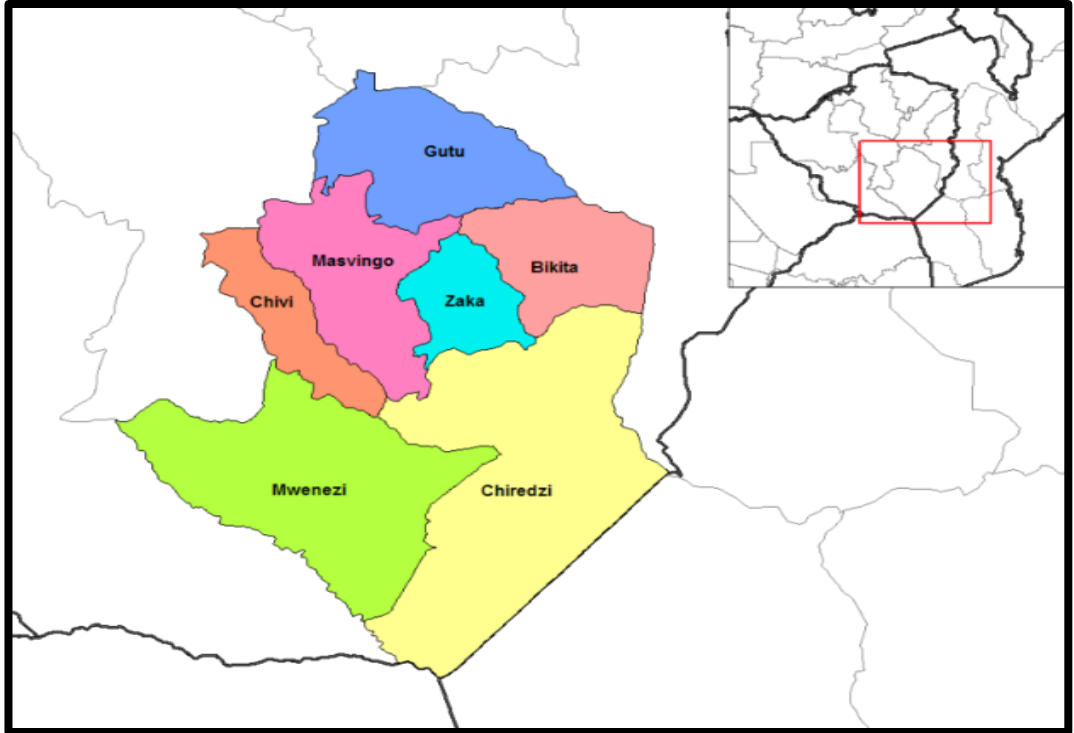


Figure 3.2: Map of study area: Zaka in turquoise blue (Source: Google maps)



Figure 3.3: Map of study area: Hurungwe in Yellow (Source: Google maps)

3.8. Sampling approach

Sampling requires decisions which try as much as possible to obtain the richest possible source of information to answer research questions (Goes, 2012; Kondziella, 2017)). This study's samples were selected using both probability and non-probability approaches to cater for the three groups of respondents. The probability sampling method was used for the quantitative strand of the study, where tourists and hoteliers were selected. There was need to give every member an equal chance to be selected through a procedure that ensured representativeness. Non-probability sampling, using the purposive, non-random and snowballing methods were then used to select the sample for the exploration of indigenous culinary claims. The non-probability methods enabled selection of subjects for the qualitative data and it was based on subjective judgement of who were to give the best information. Specifically snowball sampling assisted in identifying the elderly women within the specific areas. This enabled the process enabled easy identification of the next sampling units based on previous sample encounter. The data which was collected was narrative in nature, oral history and experience-based research. The elderly women were the specific group of respondents and they were identified as those who were suitable to give the best information for the study. Elderly women who were involved in women's clubs and "cooking shows" were part of the sample. This method had the power in selecting information-rich cases for in-depth study of indigenous culinary claims, which yielded insights and in-depth understanding.

The third cluster of respondents were the sensory evaluation panel. Probability sampling was used to select the panellists for tasting menus. Students studying Food Science, canteen staff and Hospitality and Tourism staff academic staff domain were purposively selected for their knowledge and expertise in food and taste. The samples for the laboratory tests were determined through food composition analysis.

3.8.1 Sampling Frame

Sampling frame can be defined as a pool where a sampling unit of target population can be drawn (Rahi, 2017; Sharma, 2017). Table 3.3 below presents the study's sampling frame. After a sampling design is established through defining the target population, sampling frame and sampling units, the sample size can be determined.

Table 3. 3: Sampling frame

Data	Population targeted	Sampling Procedure	Sample Size
Nature and of culinary tourism in Zimbabwe	Tourists	Purposive	200
	Chefs and Food and Beverage managers	Purposive	50
Consumption of indigenous cuisines by tourists	Tourists	Convenient	Same sample as above
	Chefs and Food and Beverage managers	Purposive	
Collection of culinary claims	Rural elderly women	Purposive Snow balling	20 per province
Assaying of culinary claims	Local culinary specialists and food scientists as panelists	Purposive and or judgemental	80

3.8.2 Sample size

Ahmad and Halim (2017) suggested that the determination of sample size is crucial for any empirical study, especially when the objective is to make statistical inference for the population based on the characteristics of the sample. Generally qualitative studies have smaller samples of usually 30 or less, while quantitative methods have larger sample of at least 50, to establish representativeness (Scott, et al, 2017; Teddlie and Yu, 2007). For qualitative studies generally respondents’ rate is 100 percent (Sunandamma and Sarasvath, 2014). The sample sizes for the study are shown in table 3.2 above. From the two representing provinces of Zimbabwe at least twenty participants were selected from each province.

A total of at least 50 chefs and 200 tourists were selected for the data establishing the nature of culinary tourism and extent of consumption of indigenous cuisines by tourists in Zimbabwe. The 200 tourist were one quarter of the Victoria falls arrivals and departures approximation of six hundred and fifty (650) of

which, according to Krejcie and Morgan (2017), A sample of 364 is adequate for 1000, therefore 200 was used, though the those who responded were 134, but 120 were considered usable. For the exploration of indigenous culinary claims, 20 respondents were selected from each study area, making a total of 40. This sample size can be justified by the fact that qualitative in-depth interviews require smaller samples. According to Field (2013), it is easy to monitor and manage a small team as compared to working with a large group or working with the whole population. At the same time data collection stopped due to data saturation. Saturation was achieved with 19 respondents in Zaka and 13 in Magunje making a total of 32 respondents. The theoretical data saturation is when additional interviews no longer revealed fresh insights determined when to stop collecting the data (Cresswel, 2018). The sensory evaluation sample was 80, because this was a specialized area, therefore people who understand the science of sensory evaluation were required. Specific samples of food, processed and prepared (freshly cooked) were used with specific quantities being accurately measured. The specific sample sizes were adequate to allow for analytic generalisation of results and samples were sufficiently represented for good quality data.

3.9 Data sources

Primary and secondary data sources were used in this study. Primary data was used to a greater extent, while secondary data was used as a supporting source. Primary data was necessary as the study aims could not be achieved through the minimal secondary data acquired from literature. Secondary data sources such as journal articles, reports, newspapers and government gazettes were used to assess indigenous cuisine culinary claims.

3. 9.1 Data collecting methods and tools

Helfferich (2019) characterizes research instruments as apparatus used to get important information from research participants. This requires an understanding of how to gather, record and coordinate data, requiring a lot of commitment, rigour and sensitivity to contexts in order to address demands of the research questions. The data for this study was collected using questionnaires, interview guides and observation guides in order to satisfy the study objectives, as explained below.

3.9.2 Qualitative data collection methods and instruments

A qualitative in-depth interview is a data collection method which gathers information and grasp issues related to the general objectives and specific questions of a particular study (Cho, 2014). In-depth interviews were used to collect data on the indigenous culinary claims. The interviews provided an opportunity to ask extra questions whenever a new line of inquiry props up during the interview. This flexibility was critical for investigation of complex issues during the process of exploring indigenous cuisine culinary claims. In-depth interviews provided rich and detailed data and new insights were obtained. The respondents had an opportunity to express in their own voice and convey what they thought and felt in a more naturalistic and less structured manner, which serves to enhance understanding of the research problem. Furthermore, the qualitative data was elicited, which helped to understand the processes followed when food was prepared, cooked by the indigenous people, the “how,” “why” and “what” of the whole process. The interviews were of a less structure protocol (open-ended) to allow for as much interaction and information as possible, as supported by Mostala (2014). The researcher was be able to listen and observe body language, as alluded to by Hofisi, Hofisi & Mago (2014).

3.9.2.1 Interview Guide

An interview guide was used to collect data on the exploration of indigenous culinary claims. The interview guide was structured in a semi-structured format. That enabled the questions to cover all the important aspects. The guide categorized the cuisines as: starches, proteins and vegetables, in order to cover all areas of the cuisine. (See appendices for the rest of the interview questions).

3.9.2.2 Observation guide/ observations

Observation were used to augment the explanations. The observation assessed the reaction of the samples to heat. The time taken to heat up and the thickening quality. In the case of sodium bicarbonate, the observation was to see how the okra increased in quantity, colour changes, among other characteristic during the cooking process. Another observation guide was prepared for use on sensory test 9. There was need for the observations because the effects of sodium bicarbonate can be seen once the sample starts to receive heat, throughout the whole process. The observation guide observed the product rising, colour changes and any other effects, such as the froth that forms and over-boiling. All observation guides were structured and the information tabulated

3.9.3 Quantitative data collection

3.9.3.1 Questionnaire

A structured questionnaire was used to collect data during the survey phase, where the nature of culinary tourism and indigenous cuisine consumption by tourists required so many aspects to be assessed. The questions had predetermined response categories, which focused on aspects which answered the nature of culinary tourism and indigenous cuisines consumption. This method allowed the researcher to have data on the tourist and industry experiences with Zimbabwe's indigenous cuisines, culinary tourism products and culinary tourism in general.

3.9.3.1.1 Development of hoteliers' survey questionnaire

The questionnaire was based on the study objectives: to establish the nature of culinary tourism and to assess the extent to which indigenous cuisine was consumed in Zimbabwe. The questionnaire had three sections, with the demographic profiles of the respondents such as gender, age range, qualifications, job title and how long employed on the first sections. Section B had questions to elicit data on the nature of culinary tourism in Zimbabwe from the supply side perspective. Questions such as knowledge of culinary, provision of indigenous cuisines, when provided, frequency, the ones provided, reasons for providing or not as well as challenges were asked. Questions also included aspects of cuisine authenticity and uniqueness. Data on promotion and exposure to culinary activities was also captured in the questionnaire survey.

3.9.3.1.2 Development of tourist survey questionnaire

A six-page questionnaire was developed, which had three sections. The first section consisted of the demographic profiles of tourists: gender, age range, education, profession, occupation and purpose of visit. Section B questions elicited responses on the nature of culinary tourism in Zimbabwe. The section had questions designed to focus on collecting data on the nature of culinary tourism in Zimbabwe. Both open-ended and closed-ended questions were included. Section C had questions which assessed the extent of consumption of indigenous cuisines by tourists. Most questions were structured with sections requesting for justifying responses.

3.9.3.1.3 Sensory evaluation questionnaires

A separate questionnaire was prepared for each experiment, to cater for the nature of sensory test done. The questions ranged from those which measured the effects of sensory attributes such as appearance, taste, aroma, and texture using descriptive attributes. Other questions for the tests evaluated the level of strength of attribute on Likert scales. Food characteristics were also measured for their intensity on a hedonic scale. The details for each questionnaire were explained for each sample tested in section 3.9.4.2

3.10 Data collecting procedures

The major approaches to information gathering are primary and secondary and both samples were used for this study. First was the secondary data which helped with an in-depth understanding of issues in question: the nature of culinary tourism, tourist extent of indigenous cuisine consumption, culinary claims use in cuisines and molecular gastronomy (the science behind cooking). The nature of this study required data to be collected in stages. For the secondary data, the processes precede permission by responsible authorities. The first phase was collection of data on the nature and extent of culinary tourism in Zimbabwe. The data collection ran concurrently as the tourist and hotelier surveys were administered at the same time, and gathering data on two objectives. This was possible because the respondents were from the same areas. Questionnaires for were administered personally to tourists, while the ones for hoteliers were left with the responsible authorities at the establishments. Hotelier respondents were given two days to answer, followed by collecting the questionnaire from the supervisor or manager on duty.

The second sets of data were the interviews to elicit data on the indigenous culinary claims. The researcher had to visit the two study sites during different times as they are distant from each other and prior arrangements and appointments done a few days before to prevent any clashes with community programmes. The data was collected from the participant's homes and setting which is their natural environment or setting which may not interfere with the results. Each interview lasted between one to one and half hours. In two cases the researcher had to wait for the interviewees who had gone to the garden. Another situation experienced during the process was going to the field where the respondent was harvesting soldier termites. In the other study area, the second day of data collection was a Sunday. After failing to see two successive respondents, because they had gone to the church, the researcher had to go and attend the service. It was an advantage as she had the chance to introduce herself and was able to get some key informants from there.

A field notebook was used generate detailed notes and observation details in order to answer the research questions. In addition, recordings were done with the permission of the respondents to ensure everything was captured during the respondent's explanations. The data collection process requires the researcher to be very observant and to possess a good memory of what was observed. Therefore observations were very critical as gestures and emphasis indicated the key areas of the information. Through probing, the researcher was able to arrive at the real claim attached to a specific cuisine preparation.

3.11 Data collection procedure for food sensory tests

The laboratory tests followed after the hypothesis were formulated from the findings of indigenous culinary claims. Panel training sessions were done in two groups. The first group were CUT staff, the bulk being students' canteen staff. The second group were CUT food science students, who did not need much training. Food sensory tests were conducted in three days. The tests were done under controlled conditions. This minimised all distractions, bias and adverse psychological factors. Food samples were prepared in a separate room from the sample testing one. The panelists were asked not to have eaten food immediately prior to carrying out a test on samples. This prevented antecedent food cooking smells from affecting the sensory tests. Noise levels were minimised as much as possible. The panelists came into the test laboratory in groups of twenty. The room was big enough for each panelist to samples the food easily.

For each sensory test each panellist' was provided with: a 50g porcelain egg cup, plastic teaspoon and serviettes. In addition, a pen and the sensory evaluation questionnaire. Twenty-five to thirty grams of the sample was used for each test. Samples were assigned three-digit random numbers so that panelists could not identify the products they tasted. Food was kept at a temperature above 75°C to prevent microbial contamination, during the sessions. The bottled water was used to clean the palate before and after testing one sample and before testing the next which assisted in giving more accurate results. Testing results for each sample tests were recorded soon to avoid bias and mixing up results. The results questionnaires were collected by the researcher soon after a testing session.

3.11.1 Materials and methods for sensory evaluation

Objective 4 of the study sought to conduct an assay on the indigenous culinary claims. Sensory evaluation was conducted on nine selected indigenous culinary claims. A number of claims were derived from the

exploration of the indigenous culinary claims, and nine claims were selected. The selection criteria was considered the cuisines which were used as main dishes used in the diet, and covered the major foods as part of a menu such as: cereals, meats, vegetables, pulses and nuts. These were categorised as starches, proteins, vegetables, or dishes which are part of the Zimbabwe cuisine. The culinary claims responded to the nine specific hypotheses which were formulated from the indigenous culinary claims. The claims focused on the processing, preparation before cooking, cooking equipment, fuel types, use of ingredients-peanut butter and cooking oil.

The following samples were evaluated: Rapoko sadza, sorghum porridge, mixed meal porridge, dried beef, free-range chicken stew, cleome gyandra (*nyevhe*) relish, pumpkin leaves (*boora*) relish, okra and creamed pumpkin (*nhopi*). Two samples were prepared for each dish for seven tests, while the mixed meal porridge had one sample and the okra had three samples. For each sample the control was the sample prepared using the specified indigenous methods (indigenous claims). Test 3 was the only test which did not have a control.

Test 1: Test for small grains effects of processing methods.

Preparation of finger millet meal

Finger millet was sourced from Murewa. Finger millet meal filling 10 litres was divided into 2 parts, to be prepared two meals using different methods of processing. One sample was prepared using the indigenous methods specification which includes: roasting, pounding, and grinding which was done using the grinding stone, while the other meal was not roasted, cleaned by winnowing, pound and was ground using the grinding meal. The finger millet was roasted in a clay pot, using firewood on a low heat for 10 minutes. Grain was left to cool, cleaned by winnowing, pound lightly in a mortar using a pestle, then ground on a grinding stone to meal. The other 5 litres of finger millet was taken to the grinding meal without any further processing done to it. The two meals were then used to prepare two (2) sadza samples for sensory evaluation.

Method for cooking finger millet meal sadza samples

Sadza was prepared under the same temperature, 'mark 4' at the same time using 2kg of meal each, and each sample produced about 3kg. The two samples of sadza were prepared and cooked according to the indigenous claims' method as follows: Ten (10) litres of water were boiled in one saucepan until just about

to boil. Water was divided equally between two pots. Five hundred grams (500g) of meal was added to each saucepan and mixed thoroughly using a whisk while on heat until the mixture started to boil. Pans were covered and left for 15 minutes. More meal (1.5kg) was then added gradually, stirring and mixing thoroughly in between the addition. Cooking continued for the next 10 minutes. When done, the samples were left covered and at mark '2'. The samples were then used for sensory test to evaluate the effects of small grain processing on the sensory attributes; appearance, taste, or flavour, aroma and texture using descriptive like dry, chewy and bland among others. The sample which was made from the unprocessed meal was evaluated first followed by the one made from the processed meal.

Test 2. Test for the effects of fermentation on the preparation of meals.

Preparation of sorghum

Sorghum was sourced from Chikwanha market in Chitungwiza. Sorghum meal from the same variety was prepared using different methods. Five litres (5 litres) sorghum was pound, winnowed, and ground to meal. The other five litres (5litres) was exposed to fermentation by put in a sack and dipped in a container of water to immerse the whole grain. The soaking was over 36 hours. The grain was removed and dried in the sun away from wind for 48 hours to make sure it is thoroughly dry. This would prevent the grains from developing a poor colour. Grain was cleaned by winnowing, then ground on the grinding stone.

Method for cooking porridge

Ten litres of water was boiled. Cold water (450 ml) was used to blend 550g of meal for each sample and equal quantities of boiled water added, stirring continuously. Thirty grams (30g) salt was added to each porridge sample. Porridge was cooked at the same temperature for 15 minutes. Two hundred grams of sugar was added to each sample of the porridge. Samples were left at the same temperature before use.

The sensory evaluation test was on the effects of soaking on the organoleptic factors of sorghum meal porridge. The effects were assessed by evaluating the strength of flavour and taste on samples using a 5. Likert scale ranging from extremely strong to absent of strength.

Test 3. Test for the effects of ingredient combinations on a porridge sample.

Preparation of mixed meal

Cow peas, peanuts and pearl millet were sourced from Chikwanha market in Chitungwiza. The meal was prepared from a combination of cow peas, peanuts and pearl millet. One kilograms (1kg) of cow peas were roasted at medium heat mark '3' for 10 minutes to develop flavour and to facilitate removal of the skin. The peas were left to just cool so that they could be handled, then crushed to remove skins, and pound into meal. One kilogram of peanuts were roasted for 15 minutes on medium heat mark '3', cooled and skins removed, sifted, then pound in a motor to powder (not butter), then sifted. Pearl millet from left over from test 2 was used as part of meal for this test. Two hundred grams (200g) of each (cow pea meal, peanut powder and pearl millet meal) was used to make the mixed meal.

Method for cooking the mixed porridge.

One sample of porridge was cooked. One sample was used so that the sensory evaluators would judge the taste of the porridge by comparing with the porridges they were used to, which normally are prepared from a meal prepared from a single food. Five litres of water was boiled, 600g of meal blended using 500ml of water to make a paste. Boiling water 4.5litre was added, whilst, stirring continuously until it started to cook. Salt (25g) was added and the porridge was left to cook for 15 minutes at mark '4'. Two hundred grams (200g) of sugar was then added, stirred to mix and dissolve and the sample left on low heat until used.

The test questionnaire evaluated the effects of ingredient combinations on the organoleptic factors. The questionnaire had variable describing the appearance and texture to choose from. Flavour and taste were tested for their strength using a 5.point Likert scale from extremely strong to absent.

Test 4. Evaluating the effects of peanut butter and cooking oil on dried beef.

Preparation of dried beef

The beef used was sourced from Koala Butcheries. Six kilogrammes (6kg) of low fat, tender cut beef was prepared for drying by: cutting into two-centimetre-wide and ten centimetres long stripes. About 50g of salt was added, to preserve it. Beef was exposed the sun to dry for 3 days. Storage was in an empty potato bag until required for use. Drying continued in the airy bag, until after a week when the beef was used.

Method of cooking dried beef samples

The beef weighed before cooking and it was 5.4 kg. Beef was boiled in an enamel saucepan in 2 litres of water for 1 hour 30 minutes at mark '4'. Tomatoes and onions (200g) were added. Salt added to taste

bearing in mind that some salt was used during the drying period. The meat was left to stew for about 15 minutes at mark '3', until the tomatoes and onion were well mixed with the beef, and a sauce formed. The beef stew was removed from the heat and weighed. It weighed about 3 kg. It was then divided into two equal portions. In one sample 200g peanut butter was added, while 200ml cooking oil was added to the other. In each saucepan 500ml of water were added and the pans left to cook at middle temperature for 30 minutes.

The questionnaire was designed to test the effects of peanut butter and cooking oil of dried beef, evaluating the quality factors of juiciness, tenderness and flavour intensity using a hedonic scale to test the strength and intensity. Another question required the sensory evaluators to choose the sample which had a better flavour.

Test 5. Effects of cooking equipment and fuel type on the quality of free-range chicken.

Preparation of free-range chicken

The chicken were sourced from in Murewa. Same breed, size and age of free-range chicken were slaughtered and prepared. Preparation ensured all feathers were removed by rubbing it using straight run mealie meal. The insides were removed and the chickens were jointed into ten cuts.

Method for cooking the free-range chicken samples

One sample was boiled in an enamel saucepan on an electric stove at mark '4' and another one was cooked by boiling in an iron pot using firewood. In each 1.5 litres of water was added. Boiling was for 1hr 30 minutes. Beside time control, temperatures and rapid of boiling were monitored so that both pots had all water finished by the end of the 1 hr. 30 minutes. Thirty grams (30g) of salt was added to each sample half way through the cooking period. The chicken was fried for 15 minutes on high heat. One hundred grams (100g) of chopped tomatoes and onions were added to each chicken and cooking continued for the next 15 minutes. The samples were removed from heat and used for sensory evaluation soon.

The questionnaire evaluated the effects of cooking equipment and type of fire on the quality factors of chicken. The questionnaire was the same as for the beef experiment, as the same aspects were tested for.

Test 6: Test for effects different drying methods of indigenous vegetables on organoleptic factors.

Preparation (drying) of spider flower (*nyevhe*)

The spider flower was sourced from Chinhanga village in Seke. Young tender leaves were picked, washed and left for 2 hours to swot. The vegetables were weighed then divided equally in half. Each sample weighed 1kg. One half of the vegetables were left to continue drying for the next 24 hours. The other vegetables were boiled in a lot of water for about 2 hours. The vegetables were then drained and dried exposed to drying for about 1 day to thoroughly dry. The spider flower vegetables were ready for use as sample materials.

Methods of cooking the spider plant (*nyevhe*) samples.

Vegetables that dried without cooking and those that dried after cooking were weighed, and 800g was used for each sample preparation. The vegetables were boiled in enamel saucepan at mark '4' using 2 litres of water for one hour. One hundred grams of chopped onions and tomatoes, 25g salt, and 100ml cooking oil was added to the vegetables. Cooking continued for the next thirty minutes. Samples were kept at the same temperature (mark '1') before being tested.

The questionnaire tested for the effects of different methods of drying vegetables on the organoleptic factors: colour, flavour, texture and taste. The questionnaire had a 7. Likert scale to measure the level of intensity of the factors for the samples first dried before boiling then dried after boiling.

Test 7: Effects of equipment and fuel types on the cooking quality.

Preparation of pumpkin leaves (*boora*) vegetables

The pumpkin leaves were sourced from Chinhanga Village in Seke. Young tender leaves were picked, washed, and threads removed (*kufurura*). The vegetables were cut by twisting them, then spread on a clean flat surface to dry. Drying took about 48 hours, followed by storage in potato sacks.

Method of cooking pumpkin leaves.

The vegetables were weighed and divided equally. Each sample ingredient weighed 800g. One sample was placed in an enamel saucepan and another in a clay pot. Equal quantities of water (1litre) were added and the clay pot was placed on fire, while the metal saucepan sample was cooked on an electric stove. The vegetables were boiled for 10 minutes and 100g of chopped tomatoes and onions were added to each and cooking continued for 5 minutes. In the clay pot 120g peanut butter was added and to the enamel saucepan 120ml cooking oil. Cooking continued for the next 15 minutes and pans left on low heat.

The test questionnaire evaluated the effects of equipment and fuel type on organoleptic factors: colour, flavour, taste, aroma and texture. The effects were measured by using a 7. Likert scale for intensity and respondents were asked the sample they preferred.

Test 8: Evaluating the effects of different butter types in creamed pumpkins.

Method for cooking creamed pumpkin samples.

The pumpkins were sourced from Chinhoyi market. To large pumpkins were washed, peeled and cut into 4-centimetre cubes. A little salt to taste was added and 2 to litres of water to boil until soft. Pumpkins were drained, weighed then divided into two equal portions. Each portion weighed 4 litres. In one sample 200ml peanut butter was added and the other one 200ml seed butter (squash (mapodzi) and spiny cucumber (magaka) seeds). The samples were creamed and left to simmer for 10 minutes at mark '2'. Samples were ready for the tests.

The questionnaire had questions for evaluating the effects of different butter types. The evaluation was on the appearance which was evaluated by descriptive variables: colourful, dull, glossy. The flavour and taste were assessed on a 5. Likert scale for extremely strong to absent. The texture difference was rated on a 5. Likert scale from no difference to very large difference.

Test 9: Evaluating the effects of different types of sodium bicarbonate on the quality of okra.

Preparation of maize cob and *musasa* wood sodium bicarbonate

The okra was sourced from Chinhoyi market. Maize cobs *musasa* wood were burnt to ash on separate metal surface. Ashes were left to cool. Five hundred millilitres of each were collected into a plastic container in which 1 mm holes were pierced. Seven hundred millilitres of water were added in each and left to drip from through the holes into a jug placed below the container. The process of distillation (*kusurudza*). The process took about 6 hrs and about enough sodium bicarbonate was ready for use in the experiment.

Method of cooking the okra samples

Three kilograms of okra were washed, cut into even sized pieces and divided equally into three. Four litres of water were put in each of the saucepans. In one bicarbonate of soda was added, the other one maize cob sodium bicarbonate and the third one soda from (*musasa*) wood ash sodium bicarbonate. Fifty millilitres of the sodium bicarbonate was used for each sample of okra. Okra was added to each saucepan and left to

cook over same temperature and at medium heat mark ‘3’ to prevent over boiling. The samples were observed for reaction to the different types of sodium bicarbonate, throughout the cooking process using the observation guide (see Appendice ?). Twenty five grams (25g) salt was used to season each okra sample. Cooking time was 20 minutes. Samples were left at low temperature. The test questionnaire had questions to assess the samples for soda type’s effects on organoleptic factors: taste and flavour and identify if there was a difference in texture.

3.12 Data analysis

Since this study had both qualitative and quantitative data the different analysis methods used will be explained below.

3.12.1 Analysis of qualitative data

Thematic analysis was used to assess the indigenous cuisine culinary claims collected. In this study it enabled exposure to salient themes in textual data at diverse levels. Transcribed data were analysed for emergent themes from the respondents’ statements and actions so as to describe their related experiences of the ways and method of food preparation and cooking. Analysis was done using the six phases of data analysis from Braun and Clarke 2006; 2012; 2013 and 2014, by: familiarising with data, data coding, searching for themes, reviewing themes, defining and naming the theme and reviewing the themes. Themes were established through reading and re-reading of recorded data until patterns were identified within a data set. The figure 3.2 below illustrates the six stages for thematic analysis by Braun and Clarke.

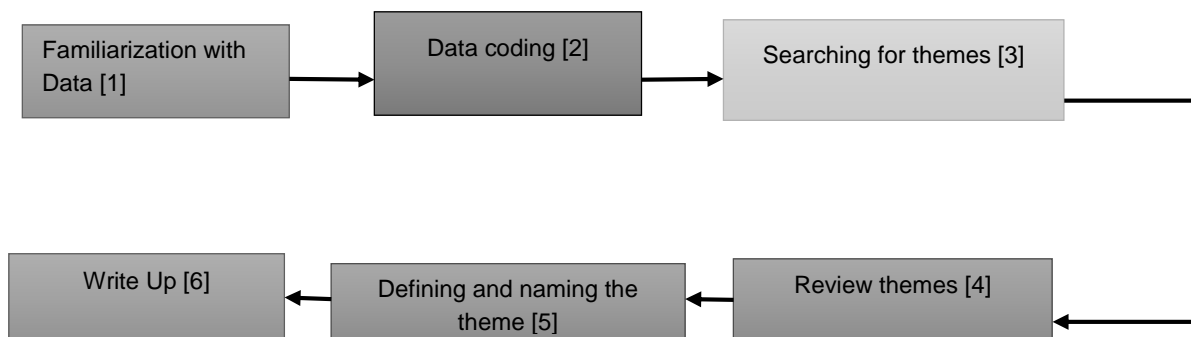


Figure 0.4: Six stages for Thematic Analysis. Adapted from Braun and Clarke (2006)

Hypothesis were formulated from the indigenous culinary claims' findings, which were then used in the fourth objective of the study. The analysis of the sensory evaluation data is to be explained next.

3.12.2 Analysis of quantitative data

Statistical analysis methods were used to analyse the quantitative data for the study. These methods were chosen because they are more reliable, objective and reduce a complex problem to a manageable number of variables and can identify cause and effect in highly controlled circumstances (Singh and Singh, 2015). Data editing, was done to check mistakes by examining the completed questionnaires, and checking for correct responses and suitability of participants. The coding process followed, where the data was converted into numerical format. Numbers were used to represent the responses chosen for all the variables and Likert scales used. The coded data was then entered directly into the statistical program and SPSS version 23 was used. The statistical analysis used are explained below.

3.12.3 Descriptive statistics.

The quantitative data on the surveys carried out on the nature of culinary tourism and extent of indigenous cuisine consumption by tourists, was analysed using descriptive statistics. Frequencies and percentages were used for categorical which included respondent's bio-data, while the other quantifiable responses were analysed using descriptives, comparing means and standard deviations. Scores revealed how far they were from the mean, to give meaning to the results portrayed by the data. The data was presented in tables, pie charts and graphs.

3.12.4 Non-parametric tests

Non-parametric tests were used to analyse the sensory evaluation test experiments. These were chosen because they are believed to be more robust and flexible than parametric tests, by being able to hold data that are skewed, have outliers and have different scales, ranks, categories and units (Kennet, Carabante & Prinyawiwatkul, 2018; Rousseau & Ennis, 2017). Therefore, considering the nature of the data and the objective to be fulfilled, there was less of a possibility to reach incorrect conclusions when the non-parametric tests were used. Three non-parametric tests were used, that is: McNemar test, Wilcoxon ranked test and one-sample Wilcoxon test as explained below, was designed to handle ordinal data (ranks) and nominal data (categories).

3.12.5 McNemar test

The McNemar is a two-sample, related samples difference test, which is an adaption of chi-square. It is also called Paired Sample Z-Test and is used to determine if the proportions of categories in two related groups significantly differ from each other (Rousseau & Ennis, 2017). The study sought to know if there was a difference in the quality attributes of the organoleptic factors, for the processed cuisine sample and that which was not processed. The McNemar's test was therefore suitable for the analysis of the sensory evaluation tests for the sadza samples, sorghum porridge and the creamed pumpkins samples. These were evaluated using descriptive attributes for the organoleptic factors of the cuisines tested. In using this method, the assessors were categorised into two categories in a 'before' and 'after' condition (Smity & Ruxton, 2020). The testers indicated on the attributes "yes" or "no" on the first sample tested and the same on the second. In observing the pattern of responses however, McNemar's test ignores those who show no change and hence, the analysis did not consider them. The big question answered was whether the difference between two samples indicated a significant difference in the population or whether it is merely chance of the difference. In the case of this study, the aim was to see which descriptives were affected by treatment, with 'treatment' being on the claims on methods such as the processing of the meals or ingredient used to prepare a cuisine.

Furthermore, the test was able to answer the hypothesis by showing the statistical significance for the null hypothesis, for the difference of the two categorical variables for the dependent samples. Null hypothesis in the McNemar was that the probabilities $p(b)$ 'before' and $p(a)$ 'after' were the same. In the statistical significance tests the null hypothesis was used and p-values associated with Exact Significant (2-tailed) and were interpreted as follows: If it was less than 0.05, it was taken as having evidence is statistical significance effect, so reject the null hypothesis that there is no difference on the cuisines, (culinary claims showed differences in product quality). The p-value that was more than 0.05 was evidence that there was not a statistically significant effect in the dichotomous categorical outcome within the interventions (processes). In that case the claims did not show statistically significant differences on the product. Further interpretation of analysed data was made using the effect size analysis according to (Cohen (2016), using the p-values give. The effect size analysis, according to Cohen (2016), was as follows; $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < 0.01$ -Low evidence, $0.01 \leq P < 0.05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

3.12.6 Wilcoxon sign ranked test

The non-parametric test Wilcoxon ranked Test comes in two forms, the one-sample and the two samples test and it is an alternative to the one-sample and two-sample t-test for ordered categorical data (Fields, 2009). It compares two means to show the difference for two-related samples, indicating whether the difference is statistically significant. Suitably used when the population is not normally distributed and variables used ranks to compare the observations, the test was used in this study in analysing most of the tests. Likert scales were used to determine the degree of strength and intensity of quality factors of the cuisine samples, (See, appendices for details). That assisted in evaluating the claims on the preparation methods, ingredient choice and combination, equipment use and fuel use. The analysis was used on the sorghum meal porridge, dried beef, free-run chicken, dried spider plant, dried pumpkin leaves, and creamed pumpkins.

The same testers were used for the two samples and changes in scores were observed through the negative and positive ranks. The Wilcoxon test examines the null hypothesis that the mean of a distribution is equal. The results were based on either positive or negative ranks. Z-Value was 95% confidence $=Z=1.96$ and greater than the null hypothesis was rejected that the intensity of the given variable was the same. Intensity and strength levels indicated the effects of the treatment, that is, was the claim statistically significant or not. The exact Significant (2-tailed) of $p < 0.05$ were interpreted as explained in the McNemar test. Effect size was also considered to strengthen the justification of results. The interpretation values for effect size commonly published in literature were used as follows: $0.10 < 0.3$ (Small effect), $0.30 < 0.5$ (moderate effect) and ≥ 0.5 (large effect).

3.12.7 One-sample Wilcoxon test

There was one test which had one sample, where a meal was prepared using three types of foods. Unlike the two- samples test, the one-sample Wilcoxon test uses the median distribution to show the difference. The experiment sought to evaluate the quality to determine its suitability for use in the selected individuals. Wilcoxon's signed rank test are used for median tests of one sample. These tests examine whether one instance of sample data is greater or smaller than the median (reference value). Wilcoxon's signed rank test not only examines the observed values in comparison with θ_0 but also considers the relative sizes, thus mitigating the limitation of the sign test. Therefore, the effect size is used as: $0.10 \leq 0.3$ (small effect), $0.30 \leq 0.5$ (moderate effect) and ≥ 0.5 (large effect).

The nature of culinary tourism and extent of indigenous cuisine consumption by tourists survey quantitative data was analysed using descriptive statistics. The sensory tests used non-parametric tests which included: McNemar test, Wilcoxon rank test and one sample Wilcoxon test using Statistical Package for Social Sciences (SPSS) Version 23. McNemar Test was used to analyse the test results where sensory factors used descriptives for the organoleptic factors.

The test evaluated if there was any change in proportion for the paired data after the treatment or when a change was affected. Each treatment was paired with a control. Each test compared the number of subjects who had changed their score in a positive direction with those who changing their scores in a negative direction. The extent of effect was also judged by comparing the scores, according to (Cohen, 2016). The statistical sign was determined by using $\leq p- 0.05$ which determined the chance to get the observed results under the null hypothesis.

Specifically, the test answered: which descriptives were affected by the process and what was the effect size? The ranked tests aimed to determine the strength of the organoleptic factors: colour, flavour taste and texture of various samples Wilcoxon ranked test was used to analyse. The test explored differences in the distribution of responses on the samples by comparing the average of the dependent and independent variables. The averages of dependent being the (effect) and independent the (treatment or cause) variables. The test for statistical significance used the Z- value ($Z \leq -1.96$) and the p-value ($\leq p- 0.05$). Mean ranks are also compared to the median of a single column of numbers against the hypothetical median. Mixed meal porridge which had one sample was analysed by the Wilcoxon ranked one sample Test. The use of various sodas which had three samples, used the Friedman test. The Friedman test compared the mean ranks between the related groups and indicates how the groups differed.

Planned observations were also done to assess the reaction to heat of the sadza samples and the okra samples. This revealed how far the scores are from the mean, thus giving the mean full results portrayed by the data. The data was presented in tables, pie charts and graphs. The researcher ensured that the analysed data was presented in the form of descriptive narratives, tables and equations. After results were laid out, a proper discussion followed, based on the output of the analysis. All the discussed results were validated by means of reviewing the literature. Data was presented on tables and figures.

3.13 Reliability and validity of data

The section below presents ways in which the reliability and validity of the quantitative and qualitative phase of the study was achieved. The researcher checked for validity and reliability of research instruments before administering them to the respondents as well before running the model during analysis by carrying the following procedures.

3.13.1 Quantitative Instrument Validity checks

According to Taherdoost (2016), the validity and reliability of a quantitative method is based on the ability to collect an important quantity of data. Face validity was used by the researcher to evaluate questionnaires in terms of readability, feasibility, layout, style, clarity and wording. Content validity was used to clarify the origin of the content and its relevance to the study. The overall validity of the study is guaranteed by careful planning of the sampling process and evaluation of each hypothesis to ensure that it indeed measures what it intended to measure. By validating, it ensures that the research intended to measure reliability, attaining the same results if research was done using the same instruments by another researcher.

Pre-test was also conducted to check for validity, reliability and practicality of the questionnaire (Ghazali, 2016). External validity also increased by enhancing representation of the population through random selection. To improve validity objectives were also clearly defined and operationalised (Mohajan, 2017). The generated instruments were pilot tested to determine their quality in terms of clarity and precision before their administration to the targeted respondents. The purpose of the exercise was to refine the research questions and make adjustments to the chosen techniques before final administration.

13.2 Quantitative Instrument Reliability checks

Validity tests were conducted on all scales. Research hypotheses were tested using Structural Equation Modelling (SEM) in AMOS. Formation of relationships between variables, detecting both direct and indirect effects, and the approximation of latent variables was used using AMOS. The nature of the study requires the use of AMOS to analyse data and test the relationships among paths. Data presentation was done on figures and tables generated using SPSS version 23.

3.12.4 Qualitative phase

The triangulation in this study design allowed for greater validity by seeking corroboration between qualitative and quantitative methods (Bryman, 2006). The qualitative method provided the study with depth and the quantitative method provides breadth while at the same time neutralising each other's weaknesses (Bryman, 2006; Terrell, 2011). This ultimately gave more complete understanding of research problem and complexity of human phenomena and enhances validity (Creswell & Clark, 2007). The credibility of a qualitative method depends on the ability and effort of the researcher to continuously refine sampling and data collection techniques throughout the process through rigorous self-scrutiny and this is viewed as the validity and reliability in the qualitative strand (Belotto, 2018). Illustratively, to enhance validity in thematic analysis, firstly the researcher pre-tested interview questions, described the participants' responses accurately, explained how the themes were generated and results finally created (Elo, Kaariainen, Konste, Polkki, Utriainen & Kyngas, 2014). However, most of the verification techniques are in-built into the research process and are ultimately pragmatic in line with the research paradigm (Spiers, Morse, Olson, Mayan & Barrett, 2018). The pilot study was conducted with two lecturers and two elderly women from CUT School of Hospitality and Mashonaland West respectively. The four respondents used for the pilot study were not included in the actual interviews. After the pilot test, some adjustments were made to the questionnaires.

3.14 Ethical considerations

All research follow recommended conduct that safeguards the self-respect, safety, and social well-being of study participants (Research Ethics Board, REB). Ethics are a critical element to any standard research as research entails the gathering of information from people about people (Punch, 2013). Permission before conducting the study was sought from all responsible authorities and boards in writing before data collection. The researcher observed and respected the participants' rights. As such, participants' identities were not exposed. Pseudo names were used where necessary. Stevens (2013) and Adams et al., (2014) posit that researchers should ensure that research participants are made aware of the purpose of the study, its aims, data collection methods to be employed, and the merits and demerits of participation in the study before they decide whether to participate or terminate the association prematurely. Details of the thrust of the research was spelt out to the informants, and the questions to be asked and how the recording was to be done. The final decision regarding information anonymity rested with the informants. Participants were

informed about the way the research study findings would be exploited before their consent. The informants themselves had their rights to protect. Participation in the research was voluntary.

3.15 Conclusion

Pragmatism, the philosophical underpinning, and mixed methods, the research design of the study were thoroughly discussed and justified in this chapter. The chapter also presented the sampling techniques, data collection while analysis methods for both qualitative and quantitative strands were introduced and defended. Ensuring reliability and validity in the study for both qualitative and quantitative methods was briefly articulated. Finally, the research ethical principles that guided this study were outlined.

CHAPTER 4

RESULTS AND DISCUSSIONS ON THE NATURE OF CULINARY TOURISM AND INDIGENOUS CUISINE CONSUMPTION BY TOURISTS IN ZIMBABWE

4.1 Introduction

This chapter presents the findings from the surveys done to fulfil the first and second objectives of the study which were: To establish the nature of culinary tourism in Zimbabwe and assess the extent to which indigenous cuisine are being consumption by tourists in Zimbabwe. Response rate, bio-data and all the quantitative responses were presented in tables, charts and graphs.

4.2 Results on the nature of culinary tourism in zimbabwe

The responses from the demand (tourists) and supply side (hoteliers) are presented as: the response rate, demographic profiles and the responses, according to the order of questionnaire starting with the tourist responses then the industry responses. Responses on similar questions were analysed and presented together to get a holistic picture of the nature of culinary tourism in Zimbabwe. The data from the supply and demand was consolidated to give a summary of the findings to show the nature of culinary tourism in Zimbabwe

4.2.1 Response rate of tourist respondents

A total of 150 questionnaires were distributed to tourists in Harare and Victoria Falls. Most of the participants were found at the Victoria Falls airport, some at The Boma, The Three Monkeys, and hotels such as The Kingdom Hotel and a group which was on their way to the National Parks. Those at the airport were waiting for their planes to travel back home and those who had arrived and were processing their documents and waiting for transport to their respective destinations. The other study area: Harare had limited access to data collection because the period when the data was collected was amid the Covid 19 pandemic induced lockdowns. As a result, local tourists made the bigger number of participants in Harare, which gave a balanced sample of local and international tourists. Data cleaning was done before using the questionnaire responses, in order to remove errors, thus preventing inconsistencies (Fakhitah Ridzuan, Wan Mohd Nazmee & Wan Zainon, 2019). One hundred and twelve (112) was the total for the usable questionnaires from tourists after data cleaning. Table 4.1 shows a response rate of (74.7%) and (25.3%) non response rate. Following Marske (2019) a threshold of (60%) is recommended, while Mundy (2012)

recommends for data analysis to go on with a (70%). This response rate was above all thresholds offered, rendering the data worthy to use in answering the research questions.

Table 4. 1: Responds rate of tourists

Questionnaires	Frequency (N)	Percent (%)
Returned	112	74.7
Not returned	38	25.3

4.2.2 Response rate of industry respondents

The industry responses for Harare and Victoria Falls were almost the same numbers. Given the fact that for Harare data was collected during the period of Covid 19, the response can be described as good. Out of the 50 questionnaires distributed, 38 were returned giving (76%), and those not returned were 12 (24%). See table (Table 4.2).

Table 4.2: Response rate of industry respondents

Questionnaires	Frequency (N)	Percentage (%)
Returned questionnaire	38	76.0
Not returned questionnaire	12	24.0

4.2.3 Summary of demographic profiles of Tourists respondents

- Though the females dominated (56.3%), there was no gender bias on the respondents. The male tourists who visited were often seized with processing travel documents, which made their female counterparts more accessible.
- On the age groups, the large percentage of respondents were in the 36-45years and 46-55 years categories, both recorded 21.4%, the 26-35 years (n=22) and 56-65 years(N=23) next with very insignificant differences. A very insignificant percentage was over 65 years.

- On the educational qualifications, those with degrees were the highest percentage (43.8%), diploma (25.9%). Very insignificant numbers had primary, secondary and the highest number of respondents had doctorate education.

With regards to professional qualifications most respondents (33.9%) belonged to the commercial sector and the education sector (23.2%), while the engineering sector had the least (10.7%) respondents.

- The employment status of tourist respondents had the majority being formally employed (45.5%) and those self-employed were next (27.7%).

The highest percentage of tourist respondents was from Africa (40.2%), then, Asia (21.7%), while America had (22.3%).

- The study found out that the highest percentage for the respondent’s purpose of visit was rest and relaxing (56.3%) and business was next (21.4%).

Table 4. 3: Summary demographics profiles of tourists

Demographic Characteristic	Categories	Frequency	Percent
Gender	Male	49	43.8
	Female	63	56.2
Age group	18-25	14	12.5
	26-3w5	22	19.6
	36-45	24	21.4
	46-55	24	21.4
	56-65	23	20.5
	Over 65	5	4.5
Highest education	Primary	3	2.7
	Ordinary	5	4.5
	Advanced	7	6.3
	Diploma	29	25.9
	Degree	49	43.8
	Masters	15	13.4
	Doctorate	4	3.6
Professional qualification	Education	26	23.2
	Commercial	38	33.9
	Health	17	15.2
	Engineering	12	10.7
Home continent	Africa	45	40.2

	Asia	31	27.7
	Europe	11	9.8
	Americas	25	22.3
Occupation	Employed	51	45.5
	Self employed	31	27.7
	Student	14	12.5
	Housewife	1	.9
	Unemployed	4	3.6
	Retired	11	9.8
	Total	112	100.0
Purpose of visit	Rest and relaxation	63	56.3
	Business	24	21.4
	Visiting friends and relatives	20	17.9
	Other	4	3.6

4.3: Results on the nature of culinary tourism in Zimbabwe.

4.3.1: Understanding of culinary tourism

The respondents, tourists and industry were quizzed about their understanding of culinary tourism, in order to ascertain their familiarisation with the concept. Knowledge of the concept gives a picture of the tourists and industry involvement and appreciation of culinary tourism. In their responses tourists indicated words such as: “travel, visit, vacation, seeking, tasting, trying, delicious, experiences, enjoyment, learning, local, different, new, unfamiliar, original, variety seeking.” That can be summarised as meaning that culinary tourism is the travel, trips or visit to experience, while enjoying a variety of local and or unfamiliar food. The industry indicated culinary tourism as including aspects such as cooking experience, preparing food and drink, exploring cities and at times experiencing their own food in a foreign land. The responses from the industry were biased towards the culinary tourism product itself, while those from tourists were on the experience or involvement aspects. The knowledge from the two groups was from their experiences: the consumption and provision perspective. According to the UNWTO (2018) culinary tourism includes tourists and visitors who plan their trips partially or totally in order to taste the cuisine of the place or to carry out activities related to gastronomy. This definition concurs with the two stakeholders’ responses as it encompasses most aspect given by the respondents. Below are some of the answers given by some respondents:

These are trips in which local cuisine plays an important role by giving visitors an experience through their culture, through food and drink, including learning how to cook. (Respondent 47), from Italy

A tourism based on the experiencing, and enjoying local cuisine, attending festivals and other food activities. Also, an opportunity to differentiate the unique aspects of the local environment through food and flavour, visiting unfamiliar area for food and tourism experience. (Respondent 86).

Tourism which has a focus to attracts foreign tourists to visit Zimbabwe to explore and taste our food in the restaurants. We get foreign currency because they also buy the food and take it home when they go back. (Respondent 61), from Zimbabwe.

An interesting response from an independent restaurant chef said:

In culinary tourism foreigners visit to taste own food prepared in a foreign land and went on to write that Portuguese restaurant can use locally produced foods to substitute some of their foods and that is unique in its self. Respondent 12.

From these results there was an indication that foreign tourists were more knowledgeable about culinary tourism than local tourists. To the local tourist culinary tourism is about enjoying local food by foreign visits than the local people. However, the definitions given in this study concur with those from food tourism researchers such as Long and Wolf. According to Long, (2018, p. 31) culinary tourism is “travelling in search for and enjoying prepared food and drink and unique memorable experiences,” while Wolf (2008, p. 289) defined culinary tourism as “any tourism experience in which one learns about, appreciates, or consumes branded local culinary resources.” Therefore, the findings reveal that the tourists and industry know what culinary tourism involves. The next aspect was to establish the nature of culinary tourism by determining whether the gastronomy offered was a motivation for choosing the destination

4.3.2 Zimbabwe gastronomy being a motivation for choosing the destination

The tourist respondents were asked if the Zimbabwe gastronomy was a motivation for choosing the destination. The majority (n=68, 66.7%) indicated “no”, to Zimbabwe gastronomy being a motivation for choosing the destination, while (n=31. 30.4%) indicated “yes”, showing that they were motivated by the

gastronomy. The wide difference of more than double was an indication that Zimbabwe gastronomy is still far from motivating visitors to the destination. These study findings concur with Sengel et al, (2015) who found that local cuisine experience has not become a motivation for some tourists. On the contrary, a study done in an Asian destination showed (88.2%) who considered food as significant in selection of the destination for vacation (Long, 2010). These results can be related to the fact that in most African countries visitors are attracted by nature and wildlife. The Victoria Falls and wildlife are the major attractions in Zimbabwe and its neighbouring countries (Jasinska, Charzynski and Switoniak, 2017). Therefore, much needs to be done so that the gastronomy of the destination becomes a motivation for visits.

4.3.3 Assessment of quality of gastronomy aspect in the Zimbabwe restaurants

The respondents were asked to assess the quality of gastronomy aspects which were ranked on a 5. Likert scale; ranging from excellent to poor. The listed aspects were traditional cuisine, service and hospitality, atmosphere in the restaurant, quality of cuisine, variety of dishes, prices and facilities. Table 4.4 shows the results of the survey, as per the mean and standard deviation.

It is interesting to note that atmosphere in the restaurant was more positive when it was ranked as very good (48.0%), good (34.4%) and excellent (17.6%) respectively and no one ranked it as poor with the scores (M=2.20; SD 0.695). The respondents were also positive about service and hospitality, (M=2.21; SD 0.810) ranking it as very good (56.9%), good (19.6%), excellent (13.6%) and fair. Traditional cuisine was ranked as good (49%), very good (25.6%), excellent (17.6%) and fair and not poor: (M=2.47) and (SD=0.875). The next aspect was quality of dishes (2.54, SD=7.93), where respondents showed that the quality of dishes was good (48.0%), very good (32.4%), excellent (10.8%) and fair (8.8%), and it was not indicated as poor. The facilities for food provision were next, ranked as very good, good, fair and poor, (M=2.62, SD=0.893), while the variety of dishes has a wide (M=3.02, SD=0.995). The variety of dishes was ranked widely; from good, fair, very good, excellent, and poor. Price was ranked generally as fair (55.9%), while few (16.7%) indicated it as good, poor (13.7%), (M=3.89, SD=0.995). From the results it can be surmised that restaurant atmosphere and service and hospitality and traditional cuisine were skewed to the positive side, while the quality of cuisine and facilities can be interpreted as mediocre.

The service and hospitality were also indicated as the reason for choosing some of the eating places by the tourists, and hoteliers have indicated comments by visitors showing appreciation of service quality. Dries

et al. (2018) opine that in the new tourism trends, the quality of a cuisine is becoming increasingly relevant in marketing a destination. The same study proposes that destination image frameworks continue to work towards producing the product on demand by tourists so that their destination is competitive. Zimbabwe as a destination should work hard to improve the quality of cuisines so that it becomes the tourist pull factor and motivation to visit.

Variety of dishes and price can be interpreted as on the lower side, as they were more skewed on the fair and poor side. Many studies have shown that variety is an important cuisine aspect, which tourists seek when they visit destinations (Robinson & Getz, 2017; Ellis, et al, 2018; Long, 2018). Findings from this study indicate that Zimbabwe indigenous cuisine did not provide the expected variety and the price which can encourage the purchase of the food. However, Reynold (2016) study on local Balinese dishes revealed the same complaints about a lack of variety of indigenous dishes from more than half the tourists interviewed.

The price of food in Zimbabwe is slightly higher than in many destinations. A research study by Renko and Bucar (2014), cited by Abdullah et al (2011), indicated that in the food service industry the customer preferences for food service, price was indicated as one of the highly rated dimensions affecting buying behaviour and customer preferences on choosing food outlets. In the same vein, some studies have shown that local foods are generally bought by the educated regardless of price (Brown, 2003). Contrary to that, average customers expect local food to be less expensive than non-local food (Jekanowski, et al, 2000). The results of research conducted in Asia (Japan, Taiwan, Malaysia and New Zealand) on a sample of 654 female consumers showed that price is the most important attribute in ethnic food purchase in Japan (Tomić, Deronja, Kalit and Mesić 2018). On the contrary Thongyim et al (2011) conclude that ethnic restaurants were chosen for food taste and service, while price and atmosphere were not that important. Much needs to be done on the pricing of traditional cuisines for viable culinary tourism in Zimbabwe. The tourists always work with a budget when they travel.

Table 4.4: Assessment of aspects of gastronomy

Gastronomy aspect	Excellent	Very good	Good	Fair	Poor	Minimum	Maximum	Mean	Std. Deviation
Atmosphere in the restaurant	17.6	48.0	34.3	0	0	1	3	2.20	.695
Service and hospitality	13.7	56.9	19.6	9.8	0	1	4	2.21	.810
Traditional cuisine	17.6	25.6	49.0	7.8	0	1	4	2.46	.859
Quality of dishes	10.8	32.4	48.0	8.8	0	1	4	2.54	.783
Facilities	3.9	45.1	32.4	14.7	1.0	1	5	2.62	.893
Variety of dishes	9.8	18.6	38.2	29.4	3.9	1	5	3.01	.995
Prices	1.0	8.8	16.7	55.9	13.7	1	5	3.89	.971

4.3.4 Choice of eating place while on holiday in Zimbabwe.

The results on the choice of eating place of tourists while on holiday in Zimbabwe are shown on figure 4.1. Hotel restaurants and independent restaurants, respectively, were the most popular choice of eating place by tourist respondents, (43.8%), and (32.1%). On the other hand, home village food outlet (18.8%) and fast-food outlet (4.5%) were less popular choices. These results indicate a very small difference between the hotel restaurants and the independent restaurant choices by respondents, indicating that tourists favour food in restaurants than fast food outlets and village food outlets. A study by Mlzi (2014), found that Thai, Japanese, Indian, Ethiopian diners frequent ethnic restaurants seeking for variety in culinary traditions. This supports this study's findings that restaurants are popular eating places. In a study by Chatibura (2015) in South Africa, restaurants were found to be the most common destination where tourists eat. In support of these results, there is every need to convert hotel restaurants or specialist restaurants into real tourist attractions (Verbeke and Lopez 2005).

These choices are supported by respondents' sentiments when giving reasons for their choice of eating place. The themes which were derived from the views were: pleasant environment, good service, quality

food, food safety, variety of cuisines offered, search for indigenous food, affordable prices, convenience, and convenient payment arrangements.

Pleasant environment: Tourist respondents indicated that hotel restaurants were clean, well ventilated, and had a good ambience. They also said that hotel restaurants were spacious. Other respondents said that staff in restaurants was smart in their black and white attire. Pleasant environment was also mentioned at the village restaurant, which had an airy atmosphere, with nature around and birds singing.

Good service: Good service supported the choice of hotel restaurant. The service was deemed professional, from arrival to departure time. Hotels were said to provide what they promised, and if not readily available, would always provide options. Good hospitality was said to be the order of the day in hotels.

Quality food: Tourists would go and have their food in hotel restaurants, independent restaurant and fast-food outlets because of the excellent quality of food. These findings concur with Israr et al (2010) who found that tourists wish to stay in hotels which provide quality food and standard residential facilities. Sentiments showed that respondents had different meanings of quality. The views on food quality were expressed as the food being tasty, and for the village outlet one respondent expressed it “having the traditional flavour” (Respondent 48). The hotel restaurant view on quality of food was also expressed as that which is safe to consume. However, food safety was another reason which was taken as a separate theme.

Food is safe: Tourist respondents who chose hotel independent restaurants indicated that food was safe, citing how hotels always strive to maintain high standards, especially in resort areas and large cities. They also said that food commodities are sourced from reputable organisations and places, showing seriousness in business and an unwillingness, therefore, to spoil their reputation. Quan & Wang (2004: 46) support these sentiments from this finding which opines how “the search for culinary-gastronomic dining in a star-rated restaurant ensures safety and a pleasurable experience.”

Tourist respondents who indicated not choosing the village outlet and fast food, gave reasons of not trusting the sources of the food used in village food outlets, and even the food handling practices. Fast food outlets were not trusted because of a habit of reusing cooking oil in their food production. One of the respondents elaborated further:

Food is not prepared under strict hygienic conditions. Some of these are open places sited in the backyards of crowded business centres with dirty surroundings. The food is sometimes very nice, but sometimes even those who prepare the food are not that presentable (Respondent 66).

Variety of dishes and price: About 60% of the tourist respondents said that the independent restaurants provided a variety of foods including traditional foods and even takeaways. They also indicated the provision of single dishes which would be cheaper, unlike in hotel restaurants where full course menus are sold at high prices, which sometimes one cannot afford. However, the findings indicated that the other 40% still feel hotels often provided similar options.

Convenience: Respondents who had come on business meetings felt the hotel restaurants were convenient, because food was taken at the same place business meetings were convened. This was believed to reduce expenses, movements and time wastage. The tourist respondents also indicated this to be cheaper as they would be charged everything as one package. These reasons were supported by Quan and Wang (2004) who also further indicated that tourists searching for food experiences on site ranges would usually include the usual daily food consumption meals such as breakfast such as breakfast. This is an indication that the indigenous cuisines become more convenient when they provide for all meals of the day.

Search for traditional food: Respondents said that they would choose the village restaurant to search for traditional, local food or organic foods. They would expect to get food cooked by fire and which did not use a lot of refined foods. One tourist exemplified the virtues of village restaurants in this way:

It is the best place when I am out with my family. I feel relaxed. The food is expected to be cheaper and I can request to roast my own meat to the doneness of my choice. Food is tasty when cooked on fire and that's what is used in the village outlets there (Respondent17).

The respondent's sentiments were very much for having meals the village set up, which should be the home of the indigenous cuisines. The idea of taking the tourist to the village becomes important in this context to increase the enjoyment in the real environment. However, the results showed that restaurants, especially in hotels are more popular as eating places for tourists. Reasons given can be summarised as:

1. The hotel restaurant was said to be convenient for people who have travelled as a group, especially, for business meetings.
2. Everything is done under one roof, resulting in less time wastage.

3. Hotel restaurants were also said to accept all forms of payment and advance payments, which is easier especially for locals who may not have foreign currency or hard cash.



Figure 4. 1: Choice of an eating place

4.3.5 Opinion on the authenticity of the Zimbabwe cuisine: Tourist and industry views'

Regarding the authenticity of Zimbabwean cuisine, tourists and the industry respondents gave their views. The findings showed varied and interesting views, some which were positive, while others were negative. Themes deduced from those who indicated the cuisine as authentic were that: a) local food is used, b) there are traditional food restaurants, c) the taste is really African traditional.

Local foods used: The use of local food was highlighted as evidence of authenticity in the Zimbabwe cuisine. Industry respondents said that dried indigenous vegetables were being used. They even supported the source of these foods, which were from the neighbouring rural areas. The use of peanut butter was evidence of cuisine authenticity, as Zimbabwean dishes are not complete without a peanut butter sauce. Tourists said their favoured experience was generally vegetables in a thick peanut butter sauce, and they

were seeing more of these peanut butter dishes. Local food use was supported by some tourists who indicated that they had seen some foods they had not seen during their previous visits, as part of the cuisines.

Availability of traditional food restaurants: The Boma was cited as one of the restaurants that were the home of authenticity. Their cuisine production was said to be done in the traditional way. One of the international tourists indicated that he had the experience of waiting for food being cooked on fire. Traditional equipment was also said to be used and the food was served in the open air.

The taste is unique: The tourist respondents described the Zimbabwe cuisine as having a taste different from other African countries. Mopani worm and goat tripe which was a common dish in Africa, tasted differently from the neighbouring countries like Botswana. The small grains sadza had its own taste, though one local tourist indicated some difference in tastes from one outlet to another. The taste being unique was supported by the voice from a local tourist:

The cuisine has a certain taste which is Zimbabwean. To me the cuisine is authentic. Our indigenous food is good, and we should guard against its authenticity jealously (Respondent 83).

The negative side on the authenticity of the Zimbabwe cuisine came up with two major themes derived from the views that: the food was losing its authenticity and the taste had changed.

Food was losing its authenticity: The older local respondents dwelt more on how the cuisine losing its authenticity, citing the use of processed foods as the reason for that loss. Similarly, the industry also said the authenticity was being lost through mainly using artificial ingredients such as flavourings and thickening agents in cooking the indigenous foods. They mentioned the need to make profits, so used what was available. This may mean that the availability of resources could be a challenge in producing an authentic cuisine. The other concern was on preparation methods, which were said to be generally technological in nature. These methods change the tastes of foods when used. The aspect of chefs not having the knowledge and skill on the indigenous methods was a common view from the local tourists. One of the respondents had this to say about the loss of authenticity in the cuisines

This is not what our grandmothers used to cook for us. It's no longer authentic. How do you expect authenticity from these refined foods? It is not even special anymore. We have to go back to the drawing board so that we win back our authentic Zimbabwe taste. It has lost the taste and the excellent healing property. The Boma are trying, but they should do more (Respondent 70).

Some of the respondents gave their sentiments as follows:

I had experienced authenticity in the goat meat, but most cuisines were not different from my country and other neighbouring African countries like Zambia, Botswana and Namibia. (Respondent 24 Spanish).

The respondent's expression showed that the Zimbabwe cuisine is unique in its own, though more should be done to really bring out that which may be missing.

Food no longer tastes traditional: The loss of taste was a concern for local tourists. Perhaps this was because they had experienced the real indigenous cuisine taste before. The international tourists were of the view that the cuisines did not have a different taste from those in other neighbouring countries like Zambia, which was contrary to others who said that the mopani worm and goat tripe had different unique tastes. A local tourist had this to say: *The food preparation and cooking techniques used were chosen because they were easier and labour and time saving: We do not have the equipment to prepare these dishes and the supply of the foods is not constant because most are seasonal. We are getting their bit by bit. In fact, we are actually reviving use of indigenous foods (Respondent 7).*

A significant number of foreign tourist respondents' indicated uncertainty about the authenticity of the cuisine as shown by such expressions: "rather authentic", "not really authentic", "not quite authentic" and "not sure". These differences in opinion can be related to the perspective of some researchers that the desire for authenticity differs and the degree of authenticity tourists seek may also differ accordingly (Ozdemir & Seyitoglu, 2017). One expressed that the authenticity was difficult to judge by the word below:

It is really one's taste to say this is authentic or not or this is more authentic than that. A cuisine may be authentic today and the next day it is not. What is important is to have food which is tasty and variety is the spice of life. (Respondent 59)

While authenticity is regarded as a predictor of travel experience and satisfaction in the tourism literature (Remission & Uysal, 2010; Sthapit, 2017), findings in this study show that authenticity in the Zimbabwe cuisine is still questionable. Furthermore, Tesanovic and Gagic (2015) said that only authentic foods can satisfy the curiosity of the traveller. This implies that a lot should be done for Zimbabwean cuisine to regain its authenticity, which this study is taking steps towards by collecting and validating indigenous culinary claims and model development. More studies have supported authenticity as a travel experience motivation,

showing that there is a relationship between local restaurants and cuisine authenticity. A study by Chatibura (2015) also revealed that tourist would select locally owned restaurants because of their location and the desire to experience authenticity.

From these responses, it can be deduced that the authenticity of the Zimbabwe cuisine is very much questionable. Production is generally not valuing authentic offerings, which aim at providing culinary tourism in Zimbabwe. The industry seemed unaware that authentic traditional foods as having a charm as a key contributor to development of a tourism industry (Bessiere and Tibere, 2013). Authentic traditional foods help destinations to be well positioned on the global tourism map by being unique (Tsai and Wang, 2013). Uniqueness promotes a destination and it boosts its finances (Henderson, 2009).

4.3.6 How well dietary needs are catered for by the Zimbabwe cuisine.

Respondents were asked to rank 5. Likert scale ranging from very well to no opinion, on the extent to which Zimbabwean cuisine was catering for dietary needs. The results were skewed on the positive side as indicated by percentages for quite well (49.0) and very well (17.6%) (Table 4.5). This gives a cumulative percentage of (66.6%). The (18.6%) indicated not very well, an indication of provision, though to a lower extent, while (11.6%) had no opinion. However, the percentage was not significant; therefore, these findings were indicative of the Zimbabwe cuisine catering for dietary needs of individuals. Literature has shown that, local foods are popular for providing healthy diets where they are consumed (Kennedy et al, 2022). These results also concur with most studies which contend that traditional cuisine improves chances of living a healthy life (Ivanova, Ivanova & Trifonova, 2017; Okumus, 2013; Tey et al, 2018). However, more should be done to make the cuisine known, because the results indicated lack of knowledge and/or experience on the cuisine. Similarly, knowledge about a cuisine includes its authenticity and ingredient and nutrient content. The validation of indigenous culinary claims aims to close this knowledge gap.

Table 4.5: Dietary needs catered by Zimbabwe cuisine

Dietary needs are catered by Zimbabwe cuisine	Frequency (N)	Percent (%)
Very well	18	17.6
Quite well	50	49.0
Not very well	19	18.6

Not at all well	3	2.9
No opinion	12	11.8

4.3.7 Zimbabwe cuisines giving a memorable experience to tourists

In relation to the Zimbabwe cuisine giving a memorable experience, the findings were rather balanced between giving, and not giving, though affirmative responses were a higher percentage (39.2%) (Figure 4.2). Therefore, the Zimbabwe cuisine can be said to give a memorable experience to those who consume it. Local cuisine should give a memorable experience for return visits as such destinations tend to be tourist destinations of choice. Studies have shown that tourists who experience cuisines which give them a memorable experience tend to choose such destinations (Long, 2013; Richards, 2012; Wolf, 2018). Other studies have shown that culinary tourism thrives on unforgettable travel experience with food and its related activities which retains destination identity, distinctiveness and attractiveness and those experiences connected with it (Lopez Guzman et al, 2014; Stone, Migacz 2017; Wolf, 2018). Reasons were given for cuisine giving a memorable experience and some of major reasons were how the taste was unique and that the foods used are processed in a special way. The tourist responses on these are given below.

The taste was unique: The taste was explained as different, even in cases where the same foods were used in another country. The tourists expressed that there was an African flair in most foods one tastes:

The food has somehow a different taste. The taste which has a certain natural flair and has a high satiety value, especially those recipes which include peanut butter. There is a different taste of most dishes from the usual British cuisines which were served in all hotels in Zimbabwe. (Respondent 31).

The foods used are processed in a special way: The respondents mentioned that the use of dried foods, especially vegetables made the cuisine real Zimbabwe. The issue of seasonality could be the reason, but it showed that tourists' memorable experience was because of that 'other,' as a result of the dried foods experience.

The results are an indication that cuisines have taken some strides towards giving tourists a memorable experience. The special ways of preparation and cooking methods using local foods should be applied everyday in the food and beverages provisions for a viable culinary tourism in Zimbabwe.



Figure 4.2: Cuisine giving a memorable experience

4.3. 8 Choice of activities for culinary experiences

In order to further assess the nature of culinary tourism in Zimbabwe, the respondents were asked to indicate 'yes' or 'no' for the choice of activities for culinary experiences. The results showed the top activities for culinary experience were: cooking competitions, renowned chefs preparing signature dishes, cuisine tasting and displaying and tasting of typical Zimbabwe delicacies. Table 4.7 displays the positive activities showing percentages, means and standard deviations in green, while the negative responses are in blue. Cooking competitions had a high mean value (1.75, SD=1.086) and can be explained as an outlier because of a very high percentage of those indicating yes (73%) to attending or opting to visit. Renowned chefs preparing signature dishes had (M=1.60, SD=0.650). Visit to cuisine tasting sessions was also skewed on the positive side (M=1.46, SD=0.500). Display tasting of typical Zimbabwe delicacies had more of the yes than no, (M=1.52, SD=0.502). The rural farm tours, food and decoration, tea garden, wine exhibition, were less popular in terms of being chosen for culinary experiences, the tourists' respondents as they had high percentages of those who indicated no, shown on Table 4.7. Wine exhibition can be regarded as the least chosen activity (M=1.82, SD= 0.407) and was more skewed on the negative side. This may be because tourists knew that the destination did not have wine yards. The activities which were indicated yes to their

experience are all directly involved with cuisines, their production and tasting experiences. Such activities give tourists exposure to various cuisine activities (Hattingh & Swart, 2016; Robinson & Gets, 2012). The choice of activities may also be related to the type of tourist, according to Hjalager (2003), where some may be existential, experimental, diversionary and recreational.

Reasons given for choosing cooking competition and renowned chefs preparing signature dishes were almost the same. These activities were indicated as the best to experience chefs doing their best, thus exposed to learning a lot of what the country has in offer. A variety of dishes are prepared during such a forum, giving a pleasurable experience. The views below were given by respondents as reasons:

I love cooking, so it can be a great experience of learning new methods used in Zimbabwe: I can also learn their culture through observing. When chefs display their signature dishes, we learn a lot. As they will obviously explain their dishes and we enjoy that. Through that memorable experiences are created. Food is presented and so will experience those forgotten cuisines of my country Zimbabwe. (Respondent 63).

Competitions are exciting and a challenge so even those not competing to do more. After attending a competition my attitude towards a foreign food may be changed, because I do not normally eat foreign foods. (Respondent 22).

Other activities were not common in choice, however the reasons for cuisine tasting were for enjoyment and appreciation of culture through food. More reasons were expressing an opportunity to have the opportunity to choose from the variety given under such platforms. Visit to rural farms will give exposure to local foods in Zimbabwe. It will also give an opportunity for an experience of how the food is produced. These results were an indication that tourists want such platforms to be part of their visit experiences. There is need to have more of such activities, so the destination indigenous cuisine to be know, thus develop its culinary tourism.

Table 4.6: Choice of an activity for culinary tourism experience.

Activities	Responses	Frequency	%	Mean	Standard deviation
Cooking competition	Yes	73	65.2	1.75	1.086
	No	38	33.9		

Renowned chefs preparing signature dishes	Yes	62	55.2	1.60	.650
	No	49	44.8		
Cuisine tasting sessions	Yes	61	54.5	1.46	.500
	No	51	45.5		
Display tasting of typical	Yes	58	51.8	1.52	.502
	No	54	48.2		
Rural farm tour	Yes	49	43.8	1.56	.498
	No	63	56.2		
Food and art decorating	Yes	24	21.4	1.79	.412
	No	88	78.6		
Tea gardens	Yes	21	18.8	1.82	.407
	No	90	80.4		
Wine exhibitions	Yes	20	17.9	1.82	.385
	No	92	82.1		

4.3. 9 Characteristics of indigenous cuisines in Zimbabwe hotels and outlets.

Restaurants and food outlets in Zimbabwe are offering indigenous cuisines, which are part of what the tourists consume when they visit the destination. The nature of culinary tourism was assessed by evaluating the characteristics of indigenous cuisines using a 5. Likert scale with categories ranging from “very poor” to “excellent.” Table 4.8 shows the respondents assessment of the service being excellent with the highest mean value (3.60, (SD=0.822)). Similarly, studies have found that service and service encounter are important in determining consumption behaviours of tourists (Chatibura, 2015; Lin & Mattila, 2010). Food is tasty and rich in flavour was next, (M=3.55, SD=0.682) while quality of food is excellent was generally indicated as “good” and “very good.” There were similar findings from consumers in New Zealand who consider sensory characteristics as most important in ethnic food (Ting, et al, 2017). Few outliers ranked quality of food as “very poor,” “poor” and others feeling that it is excellent (2.7%), thus a high standard deviation of (0.559) and a mean score of (3.39). Food meeting the price value had a low mean score (2.66) and the lowest. The characteristic ‘price’ was ranked more as good (39.8%) and poor (39.3%). The price rank shows that the customers were not happy with the price of local food. According to Wong (2008), the relationship between price and consumer food perception, if prices are expensive, will be negative.

Furthermore, the high food price at a destination can affect its image and reduce tourist satisfaction. Culinary tourism in Zimbabwe should work towards an affordable price system. Despite the difference ranking the mean values of all the characteristics were above average, so it can be concluded that the characteristics of cuisines in hotels are commendable.

Table 4.7: Characteristics of indigenous cuisines in Zimbabwe hotels and outlets.

Cuisine characteristics	Very poor	Poor	Good	Very good	Excellent	Mean	Standard deviation
The service is excellent	0	4.5	48.2	30.4	17	3.60	.822
The food is tasty and rich in flavour	0	1.8	50	39.3	8.9	3.55	.682
The quality of cuisine is excellent	0	0.9	61.6	34.8	2.7	3.39	0.559
The food meets the price value	8.9	36.6	39.3	9.8	5.4	2.66	0.964

4.3.10: What is missing on the Zimbabwe cuisine?

For Zimbabwe cuisine to lure visitors, it should be tailored towards the needs of the consumers. To further assess the characteristics of Zimbabwe’s cuisine, tourist respondents were asked to pinpoint areas of deficiency. The respondents indicated missing aspects, with major themes being: variety, service not traditional, cuisine being unfamiliar and astronomical pricing.

Variety: On variety as a missing aspect of the Zimbabwe cuisine, tourist respondents mentioned that the usual dried vegetables in peanut butter, mopani worms, rapoko and millet sadza, game and goat meat were served. They indicated that the cuisine did not have sweet dishes, resulting in indigenous themed menus having the foreign dishes like ice cream, puddings and cakes served as the sweet course. However, the lack of variety can be attributed to the seasonality of the local foods, especially the vegetables. These sentiments concur with a study done in local Balinese dishes, which revealed that more than half of the tourists interviewed complained about the lack of a wide selection of indigenous dishes (Reynold, 2016). Variety was also rated as an important criterion of their overall tourist experience. The local cuisine was also said

not to provide special diet dishes such as real vegetarian diets. These were some of the sentiments from the respondents about the lack of variety:

We always see the obvious dishes like the goat tripe rolled on the sweetbreads, though I like them very much, with their natural sweet and sour taste. There are so many foods grown, but we have not seen them as part of the dishes. (Respondent 16).

There are so many vegetables which we grew up eating, which seem to have been abandoned, yet they can make our cuisine one of the best in Africa. We always hear about The African cuisine, why? Most are like what is found in Botswana, Namibia and Zambia. We want our own. We can do it if we embrace all skills and include all our foods. It is high time we popularize our own, by including all those vegetables which just grow by God's grace. (Respondent 48).

Respondent 48 echoed sentiments which came from other local tourists. They were all looking forward to more use of the local foods. This point was valid and relevant because even within Zimbabwe the foods available differ from one region to the other. Therefore, there the use of available resources can make the cuisine popular at the same time illuminating the culinary product in the destination.

Service not traditional: The sentiments were that the cuisines were not served in suitable equipment, environments, such as the decor. One of the respondents had this to say:

Rapoko sadza we expect to served it in wooden plates and well presented the traditional way. Traditional foods are best in their traditional serving equipment. A lot of modification is being done, which removes that enjoyment through our eyes. We expect to eat sadza with our hands.

Cuisine not known: Responded indicated the cuisine was not known. Very little is marketed about the Zimbabwe cuisine. Festival, which other countries have, were said to be very rare in Zimbabwe. These results express the importance of festivals, a sentiment found in studies such as Kazembe, (2018), who submits that food festivals are a platform to showcase a destination's cuisine through various activities. According to UNWTO (2017), festivals actually attract or motivate tourists to visit in order to attend them. This sentiment is echoed in this study, chiefly because people want to consume what they know in terms of nutritive value and ingredient composition.

Price: The respondents mentioned that the price of indigenous cuisines and foods in Zimbabwe were generally on the high side. As a basic need, food should be affordable. Most tourists budget one third

towards food (Stone et al, 2018: Tsai, 2016, Wailu, 2016), so if prices are high, they may not afford, thus opting for cheaper options like buying from fast food outlets. Even local tourist respondents were concerned about the price of local cuisine. Respondent 91 had this to say:

There is no reason what so ever to pitch the prices of our dried vegetables (mufushwa) so high. Our recipes are so basic and they do not include many ingredients which can raise the price of a dish to an affordable price.

According to Chatibura (2015) attributes such as value for money, standard of service, variety and food quality, among others, are important for tourist satisfaction. This concurs with the current study, as tourists identified some of these to be missing in Zimbabwean cuisine. In that study value for money received the highest rating, showing its significant importance. High prices have been related to scarcity of foods, suggesting production should be increased.

4.3.11 Opinion on the Zimbabwe cuisine contributing to culinary tourism

The study findings from the tourist responses were that the Zimbabwe cuisine can contribute to culinary tourism in Zimbabwe. The contribution was indicated as possible through the availability of unique local foods, a rich culinary heritage and a viable tourism.

Unique local foods: The local tourists mentioned of a variety of foods in Zimbabwe, because they know about many foods which have can be used but have since been abandoned. Several scholars have highlighted how every destination has its own unique products which can be utilised for culinary experiences (Kline, et al, 2018, Baggie, 2021, Du Rand, 2016). Such foods are unique in taste and capable of making a range of unique cuisines. Literature supports the importance of unique culinary experiences. Tourists seek unique culinary experiences in destinations they choose to visit (Du Rand, 2016; Kim et al, 2015).

Rich culinary heritage: Tourists suggested that a rich culinary heritage would provide more food related activities. A diverse culture within the various ethnic groups in Zimbabwe guaranteed greater exposure to culinary tourists. One respondent had this to say:

There is a lot in the rural areas there. The covid 19 pandemic made Zimbabwe popular because of Zumbani tea. That was evidence of Zimbabwe's rich culinary heritage. (Respondent 52).

The indigenous culinary claims which were the thrust of this study aim to reveal the richness in Zimbabwe's culinary heritage.

Viable tourism: Respondents pointed out that Zimbabwe was already attracting tourists through nature and wildlife activities. This implied that the market was already there, and what needs to be done is to provide a suitable culinary product.

Other opinions were rather uncertain about cuisine's contribution to culinary tourism. Sentiments ranged from labelling local foods as inferior, unsafe or unhygienic, resulting in them being condemned. A local tourist had this to say:

Even the names of our foods are very negative, the likes of cow peas, stink bugs. Many Zimbabweans even say bad about their own food. In that situation it can be difficult for culinary food to thrive. (Respondent 69).

An important point emerges from this respondent, which Zimbabwean tourism marketing should consider seriously. More really needs to be done, for the local people to appreciate their food for culinary tourism to thrive.

4.3.12 Challenges in Zimbabwe cuisine contributing towards promoting culinary tourism

Respondents felt that a lack of familiarity with the local cuisine was the biggest challenge in its lukewarm contribution to culinary tourism. This position was also attributed to poor marketing. Other challenges include a lack of authenticity, inferior quality and limited activities. These aspects are important in any tourism development (Black, Okumus and Tasci, 2020).

Lack of marketing: Tourist respondents indicated that the cuisine was not marketed well enough, as it is not well known. This can also be supported by results on the authenticity of the cuisine, that most tourists did not know its authenticity because they had not been exposed to it. One respondent expected Zimbabwean restaurants to be opened in other destination abroad. An interesting point was that marketing starts with Zimbabweans themselves appreciating their own culinary activities. Marketing aims to achieve the needs of consumers at hand, so that they are satisfied effectively. According to Youssef (2017) through marketing, a product can be designed with the most suitable package. One tourist respondent, a hotelier, had this to say:

Zimbabwe cuisine is a hidden curriculum. It is not known. In Spain there are so many researches on their local foods and cuisine. You really have to do a lot in order to reach there.

The point was about making the cuisine known. For a cuisine to be known, it markets itself. It is the trust of this study to make the cuisine known by trying to come up with a model for culinary tourism in Zimbabwe, by using the indigenous methods of food preparation and cooking and molecular gastronomy.

Lack of authenticity: The food provided by the destination was found to be lacking authenticity. The same points were given when respondents answered the question of views on cuisine authenticity. The major authenticity areas were the food environment in which it is taken and mixing foreign and local cuisines in one menu. Food lacking authenticity was also expressed through the places where the food is prepared. Tourists indicated that they expect the village outlets to be providing such cuisines. These findings mean a lot in terms of rural involvement in culinary tourism.

Quality is questionable: The findings indicated several quality aspects lacking in the Zimbabwe cuisine, for it to contribute effectively to culinary tourism. International tourists more frequently referenced quality, as well as safety. Their experience with some independent restaurants were not that pleasing. There is need for quality to be improved.

Limited activities: Not available, limited products, not that attractive, lack of resources. The findings from both domestic and international tourists was that food related activities were very few. The respondents were saying that the culture of food in Zimbabwe was only in the kitchen, yet other avenues can be the attractions for more tourists to come. Similarly the few activities available were not interesting at all. Activities should be an everyday provision. The idea of cultural villages is an example of efforts by the destination to increase activities. However, the cultural villages seem to be only active on specific day.

4.3.13 What can be done to make Zimbabwe a culinary tourism destination?

The last question on the nature of culinary tourism in Zimbabwe sought to understand views of tourists on what can be done to make Zimbabwe a choice tourist destination. Responses presented were also from the culinary industry. The industry respondents had views which revealed their experiences with other destinations that have viable culinary tourism. From their responses, five themes were derived: Promotion of the culinary tourism product. Improving accessibility of culinary products, Branding and packaging the cuisine, Understanding tourists' needs, and Government and Tourism stakeholders' involvement.

Promotion seems to be the major point, because the other points can also assist in one way or another in promoting culinary tourism. In the same vein, any new product needs to be promoted.

Promotion of the culinary tourism product: Respondents offered several methods which can be used to promote culinary tourism in Zimbabwe. The use of online methods on websites by the Tourism Authorities, individual hotels and restaurants was a common promotion. This makes a lot of sense, since online is the mainstream form of communication globally and specifically in the tourism industry. Promotion methods given included through use of pamphlets, billboards, magazines and recipes books. When tourists arrive, they can get these at a tourism desk right at the airport or when they cross the border for those using road transport and when entering any destinations within. These can be very useful when tourists arrive and can give tourists information of the cuisine provided and where they get them. Their itinerary can then include these places. Expos, festivals and cuisine showcasing and competitions were the activities mentioned as part of culinary tourism promotion ideas. Both tourists and the industry concurred that since the destination's state of culinary tourism product is not known, there is need for vibrant promotion to be done through media platforms, websites, online advertising, and include food market days. The industry went on to indicate that it starts with raw materials, which should be availed even to locals so that they appreciate their own food, which they have since forgotten.

Increasing availability of culinary products: Tourists believe increasing culinary products would show seriousness in promoting culinary tourism. Though the theme can be part of promotion, it can stand on its own. When culinary tourism products for tourist experiences are abundant, there is a wider choice for tourists to choose from, when looking at activities. Local food was also reported to be scarce, which concurs with what industry alluded to in terms of provision, which they said was generally once a week since the foods were not that accessible. The suppliers were inconsistent with supplies.

Availability of products can also be limited by prices which may be high especially in times when foods are out of season. This point was emphasised by respondents who factored market supply and demand mechanisms:

More of the tourism products should be availed. Local foods are scarce and when you get then they are very expensive as if they are being imported. The prices should be within reach of many people and they expect value for money. (Respondent 104).

Pricing is a vital point for culinary tourism to thrive. From the responses availability referred to more culinary activities, while on the other hand more can refer to being available in many tourist destinations in Zimbabwe. There was mention of reviving women's clubs in the villages, which involved women preparing food for competitions. However, timing of activities was a crucial point, also making sure they are spread throughout the year, with more coming in the tourist peak periods.

Branding and packaging the cuisine: The point of branding and packaging were emphasised strongly. Respondents argued that indigenous cuisine should be designed in a unique and specific way which identifies it as Zimbabwean. Other respondents advocated for signature dishes, a common sight in other destinations. For instance, in Singapore many hotels have their signature local dishes, which use the “A world of Flavour” to showcase their rich multicultural food and unique flavours (Singapore Tourism Board, 2013a). Signature dishes were said to give a brand identity and would give the destinations a brand image, strengthening its identity and promote cultural heritage (Stone, et al, 2018; Wolf, 2014). These signature dishes put the destination on the map, like those listed on the UNESCO Tangible and Intangible heritage list. Most destinations atop the culinary tourism rankings have signature dishes which are a pull factor for travellers. Zimbabwe should therefore strive to have such unique and competing dishes.

On packaging, there was mention of the industry making foods and cuisine part of the travel package. That being an important point, it can be possible with availing more of these culinary tourism products. Including them as part of the tourist visit package shows the importance attached to them. An interesting response on the signature dishes was from respondent 62:

We cannot talk about culinary tourism in Zimbabwe without any dish on the map. Let us first make the products real products, which we are known for, which will motivate visitors to see. So far, we cannot point at anything which we can say come and experience.

The respondent's point was on the quality and quantity of cuisines which should be considered first. This will make available for the travel package, so that the tourism has a choice to make.

Understanding tourists' needs: This theme was derived from the sentiments that the culinary tourism product should be targeted towards a specific market. Others also said that the destination should find out if what is being offered is appealing to the tourists. One respondent actually mentioned that surveys are needed in order to understand the tourist market, stating that both domestic and foreign markets were an important part of the survey. These points are important because needs depend on the market that is targeted.

Even when culinary tourism was developed globally extant literature suggests needs were understood through conferences (Belisle, 1983; Bessiere, 1998; Cohen and Alviel, 2004; Long, 2004). In the process of understanding the needs the market is known. Understanding tourist needs assists in tailoring the product towards the needs for consumer satisfaction. This concurs with Updhyay and Sharma, (2014) who suggest that understanding tourists' culinary preferences may result in better food quality..

These findings show that surveys like this study are important in developing culinary tourism in Zimbabwe. This study aims to develop a model for culinary tourism in Zimbabwe, as a step towards making Zimbabwe a culinary destination.

Government and Tourism stakeholder's involvement: Respondents believe tourism industry development was the government's responsibility. Government should be at the forefront for any development, and policies should allow for, and be tailored towards that. These sentiments showed that respondents were of the view that Zimbabwe can be a culinary tourism destination if the government makes that a priority. Also mentioned was that the government should provide resources. Finances were the popular resource which was said to make the tourism lift-off. Some said that the release of finances for promotion was important. The infrastructure, in particular the dilapidated roads, were a priority for viable tourism. Some said that they should avail space to build infrastructure for more culinary restaurants and activity centres.

4.4. INDUSTRY'S RESPONSES ON THE NATURE OF CULINARY TOURISM IN ZIMBABWE

This section sought to present findings to establish perspectives of the supply side (the industry) on the nature of culinary tourism in Zimbabwe. These findings were obtained from questions asked which were different to those asked to tourist respondents. What they provide, how and why they produce determine the nature of culinary tourism in the destinations.

4.4.1 The range of cuisines offered in Zimbabwe.

The industry respondents' findings showed that restaurants in Zimbabwe are offering Chinese, Portuguese, Italian and Zimbabwean cuisines, among others. The findings revealed that Zimbabwean cuisines were offered by all organisations respondents were working at ($M= 1.00$, $SD 0.00$). The Chinese cuisine offering

was next to Zimbabwe cuisine in popularity (M=1.42, SD=1.42). The mean was low, may be because of the small difference of percentages 57.9% and 42.1%. for those who indicated yes and no respectively. Offering more Chinese foods could be attributed to that there were more Chinese in Zimbabwe than the Portuguese and Italians. This was important even for tourists coming to the destination. Similarly, according to Sussman (1995), Japanese, French and Italians avoid local cuisine and prefer to consume their own. The Portuguese and Italian results showed low values of cuisine offered. What they were offering was almost the same as that offered by other restaurants. The findings which showed that all restaurants are offering the Zimbabwe cuisine are an indication that the destination has realised the importance of these local foods. Furthermore, offering foreign foods in their restaurants is part of culinary tourism as there are those who do not want to taste new or unfamiliar foods. Reasons such as food neophobia, culture, religion, and health of tourists are catered for these provision

Table 4.8: The range of cuisines offered by the hotels and restaurates

Cuisine type	Responses	Frequency	Percentage	Mean	Median	Standard deviation
Chinese	Yes	22	57.9	1.42	1.00	.500
	No	16	42.1			
Portuguese	Yes	4	10.5	1.89	2.00	.311
	No	34	89.5			
Italian	Yes	5	13.2	1.87	2.00	.343
	No	33	86.8	.		
Zimbabwe	Yes	38	100.0	1.00	1.00	.000
	No	0	0			
Others	Yes	7	18.4	1.82	2.00	.393
	No	31	81.6	.		

4.4.2 The Zimbabwe cuisines offered by the restaurants

The findings presented above showed that all the respondents indicated that their restaurants offered the local cuisine. The cuisines offered were presented as: the proteins, starches, vegetable dishes, snacks and beverages.

Protein/ main dishes/entrees: The main dishes on offer listed on the main dishes were: (*matemba*) in peanut butter sauce, in tomato sauce and in white sauce. Mopani worm (*macimba*) is also offered in peanut butter sauce and in white sauce. Sweet breads (*maguru*) and (*matumbu*) stew (*zvinyenze*), free-range chicken (*road runner*) in tomato sauce and in peanut butter sauce. Few indicated road runner in peanut butter. This could be because the peanut butter sauce version was more suitable for dried road runner. More of the respondents seemed to refer to fresh road runner. Game meat like buffalo, kudu was mentioned and offered more dried than fresh. Boiled beef trotters (*mazondo*), and pork Trotters in tomato sauce were popularly offered in the independent restaurants

Starches: Peanut butter rice, rapoko and sorghum sadza were the popular starches listed by the respondents. Mealie meal sadza and samp in peanut butter were indicated by few respondents. Sweet potatoes were listed though used as a starch side.

Vegetables: A variety of dried traditional vegetables were listed to include: spider plant (*nyevhe*), pumpkin leaves (*bowora*), cow peas (*munyemba*), were prepared in peanut butter sauce or in tomato sauce. Some were offered in fresh forms, like pumpkin leaves and *tsunga*, of which both could be in peanut butter sauce, tomato sauce or white sauce. The lists also include dried cabbage in peanut butter. Pumpkins in their different versions like *mapodzi*. The vegetables included in the cuisines offered are grown in the fields and during the rainy season. However, the findings did not show the use of wild vegetables. The aspect of seasonality could be the reason; all the same the field vegetables are seasonal. Such wild vegetables could be dried and used because traditionally they were used in the dried form for use in times of scarcity. After all, they are obtained for free, where it is a question of just identifying the places and go and pick, which would reduce the price of the product.

Beverages: The list included the beverages (*mahewu*) from rapoko, sorghum and baobab drink. The results indicated that Zimbabwe has shown some strides towards offering indigenous cuisines, though there is need for better utilisation of the variety of foods which were used by the indigenous people. What the destination is doing is supported by literature which says that many hotels are offering both gastronomic services and others are using traditional foods for culinary tourism for an authentic character of the place (Panasiuk, 2014; Singapo Tourism Board, 2013a).

4.4.3 How often cuisine is offered.

The frequency of offering indigenous cuisine by restaurants showed that most organisations offered the cuisines once a week (55.3%). Other organisations offered daily (23.7%), as opposed to once a week. Occasionally, and once a month, came as the lowest offering frequencies, both at (5.3%). Special occasions also feature as when the Zimbabwe cuisine is offered. Organisations offering daily were generally the independent. Hotel restaurants offering daily were those who would include a dish or two as part of a buffet.

Table 4.9: How often cuisine is offered

Frequency of offering	Frequency	Percent
Daily	9	23.7
Once a week	21	55.3
Once a month	2	5.3
Only on special occasions	4	10.5
Occasionally	2	5.3

As a follow up to the frequency of offering, the respondents were asked the reasons for their frequency of offering. The analysis of results categorised the frequencies as less often and more often, with those offering daily and once a week as more often, while once a month, only on special occasions and occasionally as less often. Analysis of results tried to match the frequency reasons for offering with the frequencies, to get sense of the reasons. The reasons given for offering daily and once a week were almost the same. Four major themes were derived from the reasons given, that is provide for regular customers, offering variety in menu, laborious preparation, and indigenous cuisines not everyone's choice

Provide for regular customers: The respondents indicated words such as: “we have special customers,” “customers come specifically for these dishes” and “we know when they come.” Such responses meant that the cuisines were provided that frequency to provide for and satisfy their regular customers. Providing cuisines weekly was meant to provide for their regular customers. The trend of offering was generally They also during mid-week, on Fridays or Saturdays, those days when more walk-ins would be coming to enjoy with friends and relatives.

Offering variety in menu: Some of the respondents said traditional cuisines were offered for variety. The reason was given by those who offered every day and on special occasions. They said that they would include traditional cuisines on their buffet menus so that their table would have more options for people to

choose from. Furthermore, they mentioned that the buffet service, which is done for groups, will have takers of the traditional cuisines, unlike where few people are served. Mixing the dishes was said to also balance the production costs which are attached to large scale production. One respondent had this to say:

During tourist visit peak periods we offer them more often, but generally we are afraid we may run a loss. After all in most cases we charge them the same price as other dishes, yet they may be quite expensive to get them. (Respondent D).

The major reasons were that most of their customers did not want indigenous cuisine every day, citing that they were rather monotonous. The observation revealed that local customers and foreign visitors actually request for them whenever they have their special functions and days.

Limited supplies: Some foods were not always available, because of the scarcity and seasonality resulting in prices being high. It is very difficult to pre-plan in such instances because it is difficult to predict the number of tourists coming to buy. Ultimately, everything is dependent on the availability of the food supplies.

Laborious preparation: The respondents cited that their time did not give them the opportunity to prepare indigenous dishes more often, because they took more time and the preparation was laborious. This was expressed clearly by a respondent:

Preparation of these foods and the dishes is more demanding, because of their nature, unlike these processed foods we use most times. They also take a long time to cook, which is an expense on our part and if we price them higher customer may not buy them.

Chef respondents indicated that they were still considering having the correct facilities and correct equipment which would ease production.

These findings imply that indigenous cuisine frequencies of offering depend on the demands of the restaurant customers. The demands which vary, ranging from more often to less often. Other reasons are attached to the production costs, laborious preparation and the inconsistent supply of local foods.

4.4.4 Offering of edible insects

The industry respondents were asked whether they offered edible insects on their menu. The majority offered edible insects (89.5%), indicating the popularity of edible insects as part of the indigenous foods. The provision has been necessitated by how food service providers are increasingly aware that customers are more health conscious and have varied taste. Similarly, edible insects have become a popular offering because of their rich nutrient content, such as high protein and product sustainability compared to products such as meat (van, His, 2013). Though most restaurants are offering edible insects' variety remains an issue. From the findings on the cuisines offered, Mopani worms were the only popular edible insect on the list, though not included on the list, only one independent restaurant indicated offering flying termites. More research on edible insects can assist in having these foods on the market for use in cuisines.

4.10. Offering edible insects

Offering or not	Frequency	Percent
Yes	34	89.5
No	4	10.5
Total	38	100.0

The offering of edible insects as part of the indigenous foods showed that it was highly offered, (87.5%) indicating yes. The frequency of offering pattern was almost the same as that for the other indigenous cuisines, with once a week being the highest offer (34.2%). However, offering occasionally follows 23.7% and daily and once a month on the lowest. These findings indicate a significant step towards offering of edible insects, though the edible insects on offer in most cases are mopani worm (*madora*) served dry or in peanut butter or tomato sauce, either as snacks, starters or as protein dishes.

4.11. Frequency of offering

Frequency of offering	Frequency	Percent
Daily	5	13.2
Once a week	13	34.2
Once a month	3	7.9
Only on special occasions	9	23.7
Occasionally	4	10.5

4.4.5 Uniqueness of their own cuisines

With regards to the uniqueness of the cuisine they were offering, the industry respondents did not provide explicit responses. Another observation was that about half (50%) did not respond to that question. Some were quite confident and indicated that their cuisines were unique and their clients have always said that. The Boma restaurant was confident about their cuisine being unique:

I can confidently say, everything from, preparation, cooking methods, fuel type, cooking and serving and atmosphere gave our cuisine its uniqueness. So far, we have no competitor.
(Respondent B).

Uniqueness of a cuisine is the selling point and the attraction for tourist to visit a destination to experience the local cuisine. This concurs with Richards (2014) who contends that uniqueness makes food easy to present a country's culture and distinct history. The use of local food, local preparation and cooking methods were some of what was mentioned as what brings uniqueness.

A supporting statement to that effect was: *"We do not use any convenience thickeners or additives, its all-natural foods and sometimes we even cook using firewood."* (Respondent C).

Another chef said that they were using local foods in season from the village fields and garden, gave our dishes the uniqueness. They also said that the local foods were bought from the local community and prepared by them in their traditional ways. About 30% of the respondents said that the foods were actually prepared during their presence, where vegetables were picked and prepared on site. According to Bessiere (2013) cuisine aspects such as recipes are part of culinary heritage and detect the cuisine uniqueness. Preparation was generally done on electric stoves though also being done using fire, in iron or clay pots.

4.4.6 Views on hiring or employing elderly women in the preparation of indigenous cuisines.

The views from the respondents showed that they were for the idea of involving elderly women in the preparation of indigenous cuisines. Five themes were derived from the response: A platform for chefs to learn, quality cuisine, regional specialities, local food source and community engagement. These were derived from responses like; they know the methods, they know the local foods, are strict on basic ingredients, authentic taste, quality product, correct equipment and tools, will learn from them, poverty alleviation and regional foods.

A platform for chefs to learn: When elderly women prepare the dishes in the restaurants, the sentiments were that, it was good as an opportunity for knowledge to be passed to younger chefs in those restaurants. The women bring their skills to the chefs and also learn from the chefs (knowledge exchange). The elderly possess a rich culinary heritage, which is imparted to the chefs and other stakeholders in the industry. This knowledge tells a story on the what, how, when of the food preparation process (the indigenous culinary claims).

Quality cuisine: There was mention of use of correct ingredients, equipment, methods and skills, which can be summarised as a quality indigenous cuisine. The respondents believed the elderly would make the Zimbabwe cuisine authentic, with use of correct ingredients processed in the real indigenous way. Cuisine production, preparation and cooking was said to be done using real methods, resulting in an authentic taste, as attested in these views:

These elderly women have the magic in their hands. All these young ones will enjoy what they will cook. The reason that we used to lick our finger when eating was not because of bad table manners, but it was because the food tasted nice. (Respondent M).

The way they hold the cooking stick is totally different from what we chefs do. These people know their trade. They take their time and they are also very organized the way they do their cooking. They know about 'wash as you go'. My granny used to wash the cooking stick soon after use. (Respondent R).

Eighty percent of the respondents generally concurred with the above sentiments. These views show that there is confidence the elderly would produce a quality product, using local food, indigenous production methods and equipment.

Regional specialties: The views were that involving the elderly women would be an opportunity for all regions in Zimbabwe to bring in their uniqueness in cuisines. When the elderly women are invited to participate in cuisine preparation, they would come with their ways and methods which may be different from the other region. The implications of that would be an increase in variety of cuisine in the destination as a whole. The regional special dishes can also be found any part of the country. Similarly, there can be a Karanga restaurant in Mutare, while Masvingo can house a Manyika restaurant. It would be truly fascinating to have Regional Specialities Restaurants.

Local food source: The elderly were said to be involved in the processing of ingredients as well as the cooking process. In relation to that one Food and Beverages manager had this to say:

Like the chef, who is concerned about his recipe requirements are available, they will make sure the local food to use is there. When they are involved, they feel they should source for the local food them. Not only the food, but the authentic traditional foods. Involve them fully and they become part of the system and things will work for the good of both parties. (Respondent S).

The words from the respondent was agreeing to involve the elderly and communities. According to this respondent the problem of authentic foods would be solved besides other improvements in the indigenous cuisines. However, how to implement that, requires careful planning and involvement of all stakeholders.

Community involvement: An important and valid point from one respondent was that when the elderly women are involved it was good for the family. The respondent actually said that the elderly women will be employed to work in the restaurant as an indigenous cuisine chef. Earning a salary would benefit the family

. These views concur with UNWTO, (2017) who submit that rural communities benefit through production, employment opportunities, such as local chefs and tour guides. Involving local communities strengthens tourism. This can be the starting point of bringing the local cuisine to the urban areas, and in turn bringing the tourist to the rural areas where the products are found and produced.

Other sentiments: Some said that more tourists will be attracted, while others said that tourists, especially foreigners, will be driven away. Chef F said, *“That would be the best platform for knowledge sharing and customers especially tourists will really be happy to see the food being prepared by these women.”* One begged to differ and said, *“Tourists are sceptical to buy local cuisine from them for the reason of hygiene, so if they know that these rural women are preparing, they may dislike the food completely for hygienic reasons.”* The implications of these findings were that there is need for involving these elderly women from the different regions of Zimbabwe. They will bring with them their local foods, recipes, knowledge and skill. Resultantly, a true authentic and unique indigenous cuisine will be produced. That can be an opportunity to revive the Zimbabwe indigenous cuisine and culinary tourism can be developed from there. The dominant view was that, elderly produce the real Zimbabwe taste and cuisine quality. Cuisines from Zimbabwe regions would come out in their uniqueness, telling their own stories.

4.4.7 Indigenous cuisine promotions.

Some of the aspects used to assess involvement in indigenous cuisine promotions were: attending chef's competitions, food demonstrations by chefs, cooking classes, sampling of Zimbabwe's cuisine delicacies and outdoor cooking among others. The results showed more respondents had attended indigenous cuisine promotions (55.3%) than those who had not (44.7%). A close analysis of the results indicates that though more had attended than those who had not the percentage difference was small (10.6%). The difference can be interpreted as that the industry personnel in Zimbabwe are not getting enough exposure to activities. Similarly, such activities may not be frequently done in Zimbabwe. There is need for stakeholders to have such activities more often, which assists the industry in growing and resultantly, the tourism industry. These activities not only promote cuisines, but expose personnel to skills and knowledge on culinary tourism. Exposing the supply side is the first step toward exposing the demand side (the consumer). Moreover, involvement has a bearing on the product and general appreciation of what is on the ground.

Table 4. 12. Involved in indigenous cuisine promotion

Response	Frequency	Percent
Yes	21	55.3
No	17	44.7
Total	38	100.0

The industry respondents explained how their involvement promoted use of indigenous cuisine. Respondents' views can be explained in four themes: knowledge acquisition, seeing others doing, competition, and food and product exposure.

Knowledge acquisition: Attending such events and activities was said to be a learning ground. The respondents said that cooking classes were important for everyone, regardless of their experience:

When I attended a cookery class, I learnt a lot, though I have been a chef for the past ten years. It is not about indigenous cuisines but general knowledge about the industry. I really gained knowledge on hygiene issue through the cookery class I attended.

More of such events should be done as they are important in knowledge and skills sharing. The industry should also give their workers an opportunity to attend.

Sees others doing: The respondents felt that such platforms are so relaxed that attendees have full exposure. Others said that one is free to ask and things are explained. These expressions showed that the environment was able to improve skills because it was conducive. One respondent explained:

When one sees things being done, do and one is corrected. Such a platform really improves me, than when we are in our usual kitchen when we just do not give each other a chance. We will be there thinking that we know everything, yet we do not. (Respondent X).

Food and product exposure: The respondents maintained that they would learn how others are using the foods and that more can be done with local foods. When one attends all these activities there is showcasing of local foods and products. This presents an opportunity to know what the destination offers. Furthermore, one would know about the sources, be able to choose and improve supplies. These findings on what the attendees learn were evidence of the importance of such activities for the industry personnel. They would improve their skills and knowledge about cuisines. However, very few of these activities are being done in Zimbabwe. Literature has supported the importance of these even to the tourist. According to Black, Okumus and Tasci, (2020) such platforms have increased tourist confidence in trying new foods and tastes. Cuisine offers opportunities that would never occur otherwise, such as for domestic cooks, who can earn a living by sharing skills with tourists (Barcelona Field Studies Centre, 2019).

4.4.8 Organisations having embraced new trends in gastronomy

It was important to establish the nature of culinary tourism in Zimbabwe by finding out if the food and beverages industry had embraced new trends in gastronomy. Very few (18.4%), of the organisations had embraced new trends in gastronomy in the industry. (Table 4.11). New trends such as: molecular gastronomy, molecular cuisine, modernistic cuisine or the slow food movement, are key in cuisine development. Slow food cuisine, in particular, advocates for slow introduction of modern foods. Similarly molecular gastronomy calls for the collection and validation of indigenous culinary claims, to encourage their authentic use. Both encourage use of indigenous cooking methods for authenticity and uniqueness in one way or another. Embracing such trends is a step towards the development of culinary tourism in a destination. Extant literature reveals that global trends have shown that destinations doing well in culinary tourism have embraced these gastronomy phenomena (UNWTO, 2017). This gap is to be filled by this study, where indigenous culinary claims are going to be validated using molecular gastronomy.

Table 4. 13: Organisations having embraced new trends in gastronomy

Response	Frequency	Percent
Yes	7	18.4
No	31	81.6
Total	38	100.0

4.4.9. What the organisation is doing to promote culinary tourism in Zimbabwe

Responses from the industry on what that their organisations were doing to promote culinary tourism in Zimbabwe gave two themes; providing food to tourists and community involvement.

Provision of indigenous food to tourists: Provision of the food is important because every tourist requires food when they visit. However, the provision of food was an important step towards promoting culinary, because the relationship between food and tourism cannot be overemphasised. Most organisations were also providing indigenous cuisines in one way or another. Some restaurants like Boma were providing indigenous cuisine consistently.

Community involvement: Community involvement was another aspect of culinary tourism promotion. The industry responses indicated that they were sourcing food from their local community. They also mentioned that they were taking tourists into communities, through tour guides, for cultural functions, exposure of local food production, and sight-seeing. Making use of local ingredients is a constant process of learning and improving own cuisine which is determined by geographical area (Lopez Guzman et al, 2014).

4.4.10 Views on contribution of the culinary industry to tourism promotion in Zimbabwe.

The culinary industry’s contribution to the tourism industry was also used to assess the nature of culinary tourism in Zimbabwe. Views were that the contribution has not been that significant, as responses such as: “*not much has been done,*” “*tourists have not been motivated by our food,*” and “*the activities are limited.*” The other sentiments were that it can really contribute if more is done in terms of provision and improvement on the quality of products and frequency of activities. The fact that Zimbabwe has a rich culinary heritage, which can be utilised to develop diverse products for the industry, can result in significant contributions to the culinary destinations in Africa as a whole. Though some respondents echoed sentiments of few tourists seeking for culinary products, the other view was that the destination has a potential because

of the more people are seeking food for pleasure through heritage and culture experience. Culinary tourism is growing and becoming more popular globally by the day with more and more people travelling globally to learn about other cultures (Boutsioukou, 2018; UNWTO, 2018). These findings show that the culinary industry is contributing to tourism promotion in Zimbabwe through the cuisines and culinary tourism activities.

4.5 THE EXTENT TO WHICH INDIGENOUS CUISINES ARE CONSUMED BY TOURISTS

This section presents findings on the second objective, which sought to assess the extent to which indigenous cuisines are being consumed by tourists in Zimbabwe. The data was gathered from the demand (international and domestic tourists) and supply side (restaurant industry). These responses were from section C of the tourist and industry survey questionnaires. It was important to understand the consumption patterns of indigenous cuisines by tourists, so that the model to be developed can consider that information.

4.5.1 The fractions of the budget spent on food.

Food is a basic need during travel therefore, spending patterns on food help to give a picture of how important food is during travel. Budget spend on food can be used to measure food consumption patterns of tourists. The majority of tourist respondents (56.3%) indicated using (30-39%) of their budget on food, while (29.5%) indicated the (20-29%) category. Only (14.2%) indicated the (40%) and above percentage category. These findings concur with many studies done in destinations which have lively culinary tourism, which showed that the general spending on food by tourists one third of their budget (Stone et al, 2018, Tsai, 2016, Wallu, 2016). Such tourists have been found to be unwilling to reduce their budget on food (Everest, 2016. Mao, 2015). While that is the general trend, Thailand which is one of the culinary tourism giants, has percentages as high as 48% (Boutsioukou, 2018; Pullhothang and Sophia, 2016; Simasathiansophon, et al, 2020; TAT, 2012; Walter, 2017). These studies findings indicated a stake indicator of the significance of local food consumption during the visits. Table 4.14 shows the frequency distributions for budget spend on food by tourist respondents.

Table 4.14: The fractions of the budget spend on food.

Percentage category	Frequency	Percent
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20-29%	33	29.5
30-39%	63	56.3
40%+	16	14.2
Total	112	100.0

4.5.2 Extent to which tourists are consuming local food.

A high percentage (75.9%) of the tourists had eaten local food during their visit and the other (24.1%) had not eaten local food. The local foods which were on the meats included *madora*, crocodile meat, buffalo, kudu, goat meat, goat *maguru and matumbu* and road runner. The common vegetables which were listed as eaten were dried traditional vegetables such as *munyemba, nyevhe and cabbage*. Rapoko and sorghum sadza were also on the list, while, white rice in peanut butter also features among the starches. Rapoko meal porridge also featured. *Maheu* was also on the local tourists' responses than those for foreigners. The majority of those who had eaten were local tourists. These findings were an indication that foreign tourists were not that motivated to try the Zimbabwe indigenous cuisine. The findings concur and can be supported by that the Zimbabwe indigenous cuisine was also not a motivation for travel of most foreign tourist. On the contrary, Torres (2002) believes that the contemporary tourist is more open to trying local food at their travel destination. Results from Sims (2009) showed that 326 and 329 (60%) of the international tourists consumed local cuisine.

Table 4.15: Extent to which tourists are consuming local food

Responses	Frequency	Percent	Cumulative Percent
Yes	85	75.9	75.9
No	27	24.1	100.0
Total	112	100.0	

4.5.3 Favourite local foods and most popular foods from the tourist industry perspective.

The industry respondents result on most popular foods indicate that foods favoured by local tourists were different from those favoured by foreign tourists, though there were common ones. The common ones include traditional chicken (road runner) in tomato sauce, dried game meat peanut butter sauce, *maguru* and *matumbu embudzi* (*zvinyenze*). The favourite starches were rice in peanut butter, rapoko porridge and dried vegetables. The foreign tourists' respondents' favourites were the game meats such as buffalo and crocodile. Mopani worms cooked in (*gango*) also came as one of the favourites together with dried vegetables in peanut butter for both groups of tourists according to the industry perspectives. Local tourists listed mealie meal sadza cooked on fire and favoured fresh vegetables than dried especially the younger respondents. The mixture of beef bones and rape or *tsunga* (*poto yagogo*) was also highlighted by local tourists.

These findings show that indigenous cuisines are being consumed in Zimbabwe to quite a significant extent judging by cuisines indicated. However, there is need for more to be done, in terms of availing them more and making them known. Responses from the industry lists concurred with those from the tourists, though the list could not tell which ones were from foreign and those from domestic tourists. However, the lists were longer since they responded from all year-round experience, while the tourists' responses were affected by seasonality. They gave what they had seen or been exposed to at that time. Some listed items were: *mazondo*, wild mushroom, fresh pumpkin leaves in white sauce, baobab, and *mukoyo* drink.

4.5.4 Consumption of edible insect during the visit.

The results showed that the larger percentage (58.9%) tourist respondents had not consumed edible insect, while (41.1%) had consumed them when they arrived in Zimbabwe (see, Table 4.16). The respondents explained the taste of edible insects as nice and delicious. Others explained it as a very unique taste, which they could not forget easily. However, others tourist respondents said that they enjoyed them better as a snack than as relish. *Taste* has also been found to specifically influence the preference for local food among international tourists (Abraham & Kannan, 2015, p. 144). The implications of these results may be that, beside the issues of food neophobia attached to edible insects, edible insects have been popular with time because of their taste.

Table 4.16: Consumption of edible insect during the visit

Responses	Frequency	Percent
Yes	46	41.1
No	66	58.9

4.5. 5 Reasons for choosing Zimbabwe indigenous cuisine.

The choice to consume Zimbabwe indigenous was assessed by tourist respondents indicating whether it was physiological, social, esteem, convenience, health or any others and the results were as follows: An analysis of these variables indicated that health (31.3%), social reasons (26.8%), and convenience (24.1%) as the most dominant reasons, while physiological (9.8%) and esteem (5.4%) were considered of lesser importance (Table 4.17). The fact that others had the lowest percentage (2.7%) could be that the given reasons were the major reasons tourists choose to consume indigenous cuisines. This scenario of results concurs with the view that local food is generally for hedonic consumption, with emphasis on taste, and flavour seers, enjoyment, socialising and health seeking, and not necessarily satisfying hunger (Long, 2013). Long (2013) also adds that this is called the utilitarian attitude of consumption, is more health conscious, seeking more organic foods. Results from Lin & Ding, (2019) differ from this study. Their study found that the physical environment, with an authentic and traditional ambience, was highly preferred by tourist, in deciding to consume local cuisine. The physical aspect also includes the image of the local food reflect the uniqueness of the destination. Food image also includes accessibility and is in line with convenience which was one of the reasons by respondents in this study (Chi, Chua, Othman, and Karim, 2013).

Table 4.17 Reason for choosing Zimbabwe indigenous cuisine

Reason	Frequency	Percent
Health	35	31.3

Social	30	26.8
Convenience	27	24.1
Physiological	11	9.8
Esteem	6	5.4
Other	3	2.7

4.5.6: Having taken away the Zimbabwe local foods as a souvenir

In tourist responses to the foods being taken as a souvenir, indications that very few have taken local food as a souvenir, as shown by a wide difference of (79.5%) for “no,” and (20.5%) “yes” (Table 4.18). For those who indicated “yes,” mopani worm, kapenta and game meat (biltong) were on the list for being taken to share and enjoy with their friends and relatives, back home. In particular respondents from Spain indicated taking with them, mopani worms though they were also available in their country. Their species was available during different times of the year, and they said that theirs had a different taste. Dried vegetables, sorghum and rapoko meal were other foods which were taken as a souvenir. Most of the food souvenir tourists were Zimbabweans living in the diaspora. One respondent explained, “*Our country does not allow, but I wanted to carry matemba, so that I fry them, because I enjoyed them very much*” (Respondent 37). Tourists can buy food and beverage souvenirs over the Internet, even when they are far from the visited destination (Hall and Sharples, 2008).

Table 4.18: Taken local food as a souvenir

Responses	Frequency	Percent
Yes	23	20.5
No	89	79.5

4.5.7 Extent of agreeing to the reasons for indigenous cuisine experience when visiting Zimbabwe.

The reasons for consumption of indigenous cuisine are an important element of culinary tourism. The extent to which respondents agreed to the exciting experience, health reasons, learning or knowledge, authentic experience, togetherness and prestige as the reasons for indigenous cuisine was highly ranked, as shown on table as shown on Table 4.19 by agreed and strongly agreed to those reasons. Very few indicated the negative side by disagreeing and strongly disagreeing, while more were unsure, than disagreeing and strongly disagreeing. Most of the mean values were above 2 except for leaning and knowledge which was slightly below the average ($M=1.96$, $SD=0.684$). Prestige was ranked highest ($M=2.15$, $SD=0.965$), as a result the highest cumulative percentage on the positive side strongly agreeing and agreeing. Kim et al (2006) has related prestige to those who want to boast their culinary explorations and repertoire.

According to Hjalager (2003), and Yuksel and Yuksel (2003) tourists associated by prestige are experimental gastronomy tourists. They are said to seek trendy and fashionable foods which can be associated with their lifestyles. In addition, they prefer designer cafes and restaurants where they consume food and consider food consumption as a way of satisfying their needs which are associated with prestige. Health reasons and authentic experience were next, both ($M=2.10$) and ($SD=0.816$ and 0.880) respectively. The high standard deviation on authentic experience was probably because of the high percentage of those who were not sure. These results concur with those from Choe and Kim (2018) in addition to taste or quality health is an important consumption factor.

This was an indication that a number of respondents lacked knowledge about the authenticity of the local foods or indigenous cuisine experiences in the destination. These results concur with the respondents' opinion on the authenticity of the Zimbabwe cuisine, where most were not sure about its authenticity. Studies in Thailand, and many other destinations, have shown authenticity together with ethnicity, sustainability and health issues ranked on the top (Bjork and Kaipainen-Raisanen, 2014; Walter 2017, Ellis et al, 2018). This study's results are almost concurring, as these come as part of the top experiences.

Togetherness was next ($M=2.05$, $SD=0.761$), followed by exciting experience ($M=2.02$, $SD=0.759$), and learning and knowledge ($M=1.96$, $SD=0.684$). Though leaning and knowledge had the lowest mean value, the responses were more skewed on the positive side. The results are interesting as they had small

differences as indicated by the range of mean and standard deviations. Furthermore, the results showed that all the reasons were important for cuisine experience in destinations such as Zimbabwe. Hence indigenous cuisine consumption should provide for all these experiences. The reasons are the push pull factors for tourist to travel and the motivating factors to choose destinations to experience indigenous cuisines and culinary tourism in general, as supported by Kim, Lee, and Klenosky (2003)

Table 4. 19: Extent of agreeing to the reasons for indigenous cuisine experience

Variable	Strongly agree	Agree	Unsure	Disagree	Strongly disagree	Mean	Standard Deviation
Exciting experience	24.1	53.6	18.8	3.6	0	2.02	0.759
Health reasons	22.3	51.8	19.6	6.3	0	2.10	0.816
Learning/Knowledge	24.1	56.3	18.8	6.9	0	1.96	0.684
Authentic experience	27.7	40.4	27.7	3.6	0.9	2.10	0.880
Togetherness	22.3	51.8	23.2	0.9	0.9	2.05	0.761
Prestige	26.8	40.2	25.0	4.5	2.7	2.15	0.965

4.5.8 Cuisine meeting tourist expectation

In response to Zimbabwe cuisine meeting the tourist expectations, findings from the tourist respondents showed a small difference between those whose expectations were met and those not met. In Table 4.20, Fifty-two-point seven percent (52.7%) indicated yes, while (47.3%) indicated no to cuisine meeting what they expected. Though more indicated that cuisine was meeting their expectations, the results had a difference of only (5%). This may be an indication that the Zimbabwe cuisine is still not that appealing to tourists or they do not know much about it, and were therefore, they having their first experience of it.

These results may be affecting the extent of indigenous cuisine consumption. More should be done to raise the cuisine to the levels of tourist expectations.

Table 4.20: Cuisine meeting expectation

Responses	Frequency	Percent
Yes	59	52.7
No	53	47.3

4.6 RESPONSES FROM THE INDUSTRY ON EXTENT OF INDIGENOUS CUISINE CONSUMPTION BY TOURISTS

The extent of indigenous cuisine consumption in Zimbabwe by tourists was also measured from the supply side. Chefs, managers and food and beverage managers were used as respondents. The findings on questions which were not the same as those tourists were asked will be presented.

4.6.1 Demand for indigenous cuisines by tourists

The respondents were asked to rank the demand for indigenous cuisines by tourists with the aim of measuring the extent of indigenous cuisine consumption by tourists. The results showed that the demand for indigenous cuisines was high as the responses were more skewed on the positive side. As shown on Table 4.21, though mediocre had the highest percentage (39.5%), it is interesting to note that the demand was ranked high since the cumulative percentage for high (36.8%) and very high (18%) becomes (54.8%). The other evidence was the lowest ranking was low at (5.3%). These study findings concur with those in destinations such as France and Switzerland (Comert and Ozkaya, 2014). Their restaurants have responded to the high demand and are serving local ingredients. With this scenario, Zimbabwe as a destination can utilise this opportunity by boosting local cuisine to make it an attraction for tourists to visit Zimbabwe. Cuisines and local food resources should be tailored towards a viable culinary tourism, bearing that the country is blessed with rich culinary heritage (Brazier, 2020). This fulfills the culinary tourist demand for

quality cuisine, which exposes them to the other, while others also look for quality which is not very different from their own.

Table 4. 21: Demand for indigenous cuisines by tourists

Demand level	Frequency	Percent
Very high	7	18.4
High	14	36.8
Mediocre	15	39.5
Low	2	5.3
Total	38	100.0

4.5.2 Group of customers with a higher demand

As a follow-up to the question on demand, industry respondents were asked about whether it was the domestic, foreign or both tourists who had a high demand for indigenous cuisines. According to the industry personnel who provide food and beverages, the demand for indigenous cuisines is by both domestic and foreign tourists. Table 4.22 shows that both domestic and foreign tourists have a high demand for local cuisine (52.6%). The results can be verified by the cumulative percentage of (47.3%) for domestic and foreign response, which is a small difference from both responses. Furthermore, the results reflected that the industry’s experience also showed that domestic tourists have a high demand for indigenous cuisines. As shown on Table 4.23, the domestic tourist demand of (36.8%) is significant for a viable domestic culinary tourism. On the other hand, an analysis of these findings reflects that while both groups of tourists demand indigenous cuisine, the domestic tourists have a higher demand than foreign, since the foreign on their own were selected by only (10.5%). This could be explained by the fact that foods people come across when growing up leave a big impact on their memories and digestives system (Zhang, 2019). These could be the implications of such results.

Table 4. 22: Group of customers with a higher demand.

Tourist category	Frequency	Percent
Domestic tourists	14	36.8
Foreign tourists	4	10.5
Both	20	52.6
Total	38	100.0

When asked for the reasons for the groups' high demand, the reasons which came out for those who indicated domestic tourists were health reasons, and the desire to taste organic foods and enjoy their ancestors' diet. On health reasons the respondents accepted that many people had turned out to be more health conscious than before. They are aware of the rich nutrients local foods have. Respondent 16, a food and beverages manager explains:

Local customer know demand what they are calling "real" health food. It is surprising how some of these local people show that they are eager to eat peanut butter sauce.

With respect to organic foods, local people were taking them as preventive measures and remedy for different ailments and conditions. Education has contributed to local people realising the importance of indigenous and organic foods. Such foods are healthier than today's refined foods on most markets. Organic foods were said to be free from artificial products used in processing. There seems to be a new trend and patterns of which foods to consume. Some were said to want to enjoy the taste that was vanishing, that could be found in their ancestors' food.

Foreign tourists' reasons revolved around experiencing different tastes, experience culture through local foods and activities. Health reasons were also given for the foreign tourist's high demand. The foreign tourists were for enjoyment through experience of that which they were not used to. New and authentic tastes were on demand. Foreign tourists were said to be rather stricter with their choices. Not much was said about low demand. An important point from the respondents was that low demand was more of an attitude toward indigenous foods by some local tourists:

Some local visitors frown at their own food on the buffet table. Imagine in the presents of a foreigner. What would you expect of that person.? (Respondent 22).

Another attitude-based reason for low demand was the assumption that food is dirty and also prepared under unhygienic condition. In support of this Respondent 7 said:

Some of the foods naturally live under dirty conditions foods, the likes of some if not all edible insects. Fear of the unknown could be another major reason for shunning such foods.

Literature indicates that: international tourists are often conservative and sceptical when it comes to trying new foods, but at the same time remain attracted to these foods (Amuquandoh, 2011). Torres (2002) believes that modern-day tourists demand fewer Western foods and are more open to trying local food at their travel destination. Belisle, cited in Torres (2002) concludes that it is possible to shift tourists' taste to local foods. There is also an emergence of specifically tourism-oriented culinary establishments. These establishments provide neophobic tourists with familiar food and make local food accessible and attractive to neophilic tourists (Cohen & Avieli, 2004).

4.6.3 Opinion on the future of indigenous cuisine consumption

In consolidation of the industry perspective on the extent of indigenous cuisine consumption by tourists, a question was asked on their opinion on the future indigenous cuisine consumption. The industry respondents showed that the future of indigenous foods was bright. Words and phrases were given as: *"indigenous cuisines are here to stay," "local foods are the in thing," "more and more people are valuing indigenous foods more,"* and *"globalisation has facilitated foods to be known and be available anywhere and anytime."* The industry view on indigenous cuisines consumption was that more and more people were for indigenous cuisine. Visitors may demand the Zimbabwe cuisine in their home restaurants. The Chinese restaurants were said to have been availed as there was high demand for Chinese food. That is enough evidence of indigenous food consumption. Such responses show that local cuisine can be from one's home or where they visit. The (42%), who do not demand the Zimbabwe cuisine, should be catered for by the destination providing them with their home cuisine. The future of indigenous cuisine consumption is bright despite globalisation which has availed numerous cuisines everywhere. Products can be sourced anywhere anytime. The question now becomes about cuisine authenticity. Competition was another aspect from the respondents. They said that for a destination to be competitive, they have to go with tourism trends.

Gastronomy and cuisine tourism contributes highly to tourist arrivals in developed countries, showing a bright future to indigenous cuisine consumption. With reference to reasons for high demand, the product should be of the quality the tourist looks for.

Quan and Wang (2004) further discuss how identifying these experiences in their context are important for the destination's developers to be able to describe the tourist experience. For example, a destination developer may either choose to create an environment that is similar to the comfort of home for the daily dining individual, or incorporate a newly emerging aspect of tourism to make the tourist experience motivating or memorable to establish a peak tourist experience.

Food and cooking styles may even serve as international brands (Du Rand *et al.*, 2003:99; Lin *et al.*, 2011:44; Tsai and Lu, 2012:304) and knowledge of what tourists prefer may result in the development of culinary events (Mak *et al.*, 2012). As culinary knowledge was used in the development of marketing policies, so it can be used in the development of food safety policies. For example, Wongprawmas and Canavari's (2015) results in Thailand suggest to producers and marketers that there is a perceived need for a higher level of food safety in the fresh produce supply chain.

As culinary knowledge was used in the development of marketing policies, so it can be used in the development of food safety policies. For example, Wongprawmas and Canavari's (2015) results in Thailand suggest to producers and marketers that there is a perceived need for a higher level of food safety in the fresh produce supply chain.

4.7 Conclusion.

The nature of culinary tourism in Zimbabwe was an important spring board for this study, which sought to develop a model for culinary tourism in the destination. Findings indicated that culinary tourism knowledge is to a lesser extent by local tourists, is still in its infancy and still not a major motivation to visit the destination. Tourists are generally comfortable having their meals in hotel restaurants, because of the atmosphere, service and hospitality, unlike other food provision outlets. The quality of food (commendable), authenticity (questionable) and the pricing (exorbitant) are some of the aspects which define the nature of tourism in Zimbabwe. Places to visit were limited, though the tourists are really willing to visit and partake in food related activities. Hotel and independent restaurants were offering indigenous cuisine though to a lesser extent, judged by the frequencies of offering, and variety which was still limited.

Reasons given were the cuisines not everyone's choice, foods used seasonal, laborious cooking methods among others. Findings indicated that culinary tourism has the potential, and what is missing is providing the real unique product, which differentiates the destination.

It was interesting to hear that tourists spend about one third on their budget on food, a factor which the provision of indigenous cuisines should capitalise on. However, consumption of indigenous cuisines, especially by foreign tourists is still low, while local tourists consumed more. Foreign tourists were not motivated to try local cuisine for fear of their health and fear of trying new foods. For those interested, foreign tourists' choices were mainly on game meat and fresh local vegetables. The industry indicated a high demand for indigenous foods by local tourists. This information is important in assisting local food contribution to tourist satisfaction, choice of destination and marketing of local gastronomy. The findings of the study can be used to design a product which will target the right population of tourists for consumption of local cuisine. Whilst the indigenous culinary claims will be analysed in the next chapter, the findings can be synchronised to come up with a product, thus a model, for culinary tourism in Zimbabwe.

CHAPTER 5

RESULTS AND DISCUSSIONS: INDIGENOUS CULINARY CLAIMS

5.1 Introduction

The findings were used to answer the fourth objective of the study which sought to conduct an assay of Zimbabwe’s indigenous culinary claims through molecular gastronomy. Though the interviews were carried out in vernacular (Shona), translations were done and data was presentations in English. Table 5.1 below shows the interviewees and the data they provided. The section after the table shows the history of food and eating of the areas where data was collected.

Table 5.1. Characteristics of interview participants and data provided

Participant	Ward	Age	Marital status	Data provided
1	14	64	Married	Sadza-rapoko-preparation of meal and cooking. Termites and magurwe preparation and cooking. Serving dishes. Cooking vessels/pots. Cooking taboos.
2	14	68	Married	Mapfunde and mhunga sadza- preparation of meal and cooking. Porridge, Relish- beef, goat meat, chicken, hanga, garakuni, swararara, madora-preparation and cooking. Wild vegetables, okra- picking preparation and cooking. Maheu drink. Cooking equipment and vessels. Pumpkin seeds dishes. Firewood types. Cow peas dishes. Sauces.
3	14	66	Married	Meaning of food. Advantages of indigenous foods. Medicinal properties of some foods. Use of pumpkins- seed, and the threads (<i>marovhu</i>). Slaughtering of fowl. Food taboos regarding who should eat specific foods.
4	14	69	Widow	Sadza and relishes which go well together. Mavise/ mashamba uses. Wild mushro om- where they are found. How to pick black jack (<i>mhuuyu</i>). How to prepare and cook pumpkin leaves (<i>mubowora</i>). Using clay pots for cooking. Food processing equipment. Cooking temperatures to enhance doneness and flavour to vegetables. Textures which enhance flavours and satiety of pep <i>sadza</i> . Preparation of cow peas dishes.

5	14	70	Widow	Harvesting termites, preparation and cooking. Preparation, cooking and serving of rapoko meal <i>sadza</i> . Food preparation ceremonies (nhimbe). Roasting equipment.
6	14	64	Married	Preparation and cooking termites. Preparation and cooking of sorghum <i>mapfunde sadza</i> . Use of cooking vessels.
7	14	72	Married	Importance of food. Preparation of small grain meal, cooking and serving. Preparation of <i>manhuchu</i> . Health claims of dishes. Cow peas preparation and cooking of dishes- <i>rupiza</i> . Souring of milk, extracting of cream. Drying vegetables and cooking, suitable serving proteins or meats. Effects of peanut butter in foods added.
8	13	73	Married	Hlangani tribe originally from Chiredzi. Husband also contributed in the interview. Hlangani diet specialist. Meaning of food in the Hlangani tribe. Health effects of food. Porridge from rapoko meal. Hunting, preparation and cooking of <i>homuyatata (mombe yababa)</i> . Mice trapping, preparation and cooking. Preparation of pumpkin seeds peanut butter (<i>runinga</i>). Uses of <i>runinga</i> . Preparation and cooking of road runner and <i>garakuni</i> . Cooking fuel, temperatures and recipe consistencies. Serving equipment and techniques.
9	13	61	Married	Picking, hygienic methods of drying vegetables, cooking and serving combinations of the starches. Preparation and storage of vegetables. Improving nutritional value of dishes or foods during drying. Health benefits of foods. Rapoko porridge meal preparation.
10	13	65	Widow	Hlangani tribe- Homuyatata/ Tortoise slaughter, preparation and cooking. Preparation of pumpkin leaves (drying without boiling first). Edible insect (crickets, flying termites) preparation and cooking.
11	13	75	Married	Foods mixed with medicines-medicinal properties, preparation. Preparation and storage of biltong. Cooking dried meats in peanut butter or <i>runiga</i> butter. Suitable foods to use various butter types. Cutting sized of meat for cooking.
12	13	67	Married	Picking, preparation and cooking of pumpkin leaves, flowers and baby pumpkins. Methods of adding peanut butter to vegetables. Peanut butter sauce consistencies. Food flavours and taste combinations. Cooking mixed

				vegetables. Beverages clay storage and serving pots types and functional properties.
13	13	62	Married	Preparation of rice and <i>rukweza</i> meal, cooking and serving. Cooking tools and equipment. Time and temperature control during cooking. How to measure/ determine quality of prepared dish. Cooking road runner in its sauce and fresh in peanut butter. Preparation and drying beef, cooking and serving.
14.	16	67	Married	Knowledge sharing. What indigenous foods are? Preparation and cooking delicacies. Traditional beverages preparation. Harvesting/ picking, preparation and cooking of vegetables. Preparation of different types of butter and uses. Special cooking pots. Quality from soaking meal types and uses. Taste and flavours of dishes. Quality dishes/ cuisines from cooking methods. Meaning of serving food and eating together. Pumpkin family foods uses and preparation and cooking methods. Drying of mealies on cobs and the dishes from them.
15	16	69	Widow	Background about traditional food importance and meaning. Hospitality of food. Indigenous knowledge sharing methods. Indigenous foods and beverages.
16	16	63	Married	Knowledge sharing platforms. What are traditional foods. Mushroom-picking, preparation and cooking. Preservation methods. Peanut and sesame seed butter uses in mushrooms and chicken and porridge. Pep consistencies and taste effects. Green cow peas and dried uses.
17	16	65	Widow	Knowledge of indigenous foods. Indigenous foods and health. Use of peanut butter. Indigenous vegetables- preparation and cooking. Degree of doneness to enhance taste. Beverages from leftover sadza- preparation method.
18	24	70 +	Widow	Health benefits of local foods. Knowledge sharing. Beverage's preparation and the fermentation process. Use of suitable storage equipment and effects of fermentation and taste.
19	24	67	Married	What are indigenous foods. Knowledge sharing methods. What are indigenous foods. Preparation of cow peas for <i>rupiza</i> and cooking the dish. Temperature control in cooking. Relish from rapoko and sorghum. Satiety value of different small grain meals. Food taboos. Meal grinding methods effects on food flavour. Effects of clay pots of food taste.

Mashonaland West interviewees				
20	11	68	Married	Wild okra types cooking using different types of soda and wild vegetables preparation and cooking. Wild herbs used to enhance dish taste when cooking vegetables. Use of cucumber seeds for (<i>dovi</i>). Knowledge <i>about</i> edible mushrooms, preparation. Game meat- preparation and cooking. Edible insects' preparation and cooking. Slaughtering of chicken to prevent stinking.
21	11	72	Widow	Preparation of cereals grain meal to enhance flavour. Cooking pots and shapes in relation to use. Time control for boiling (<i>kukwata</i>) sadza. Preparation of <i>mabumbe</i> . Uses and preparation of pumpkin, mapudzi, seeds and extracting oil from seeds. Cooking fish using the water lily (<i>chambodya</i>) or maize cobs. Temperature control and food taste and flavour. Traditional beverages. Use of mukoyo plant.
22	11	67	Widow	Preparation of meal-rapoko. Cooking porridge using soaked meal. Health method of preparing dishes. Methods to increase satiety value of dishes. Traditional beverages from sorghum, rapoko. Cooking and serving brown rice. Protocols of serving food.
23	11	63	Married	Preparation and cooking wild and domestic birds. Edible insects preparation and cooking. Okra cooking using soda <i>utyora</i> from centre of maize cob. Effects of <i>utyora</i> on the quantity of okra. Picking, preparation and cooking of wild and field vegetables. Cooking techniques-use of lid or not. Health claims of manyanya and wild vegetables. Advantages of wild fruits as food. Preparation of green mealies for buns. Food taboos. What to serve with dried vegetables in peanut butter. Serving leftover sadza. Chicken portions and serving, in the home and during functions. Use of mashamba.
24	11	64	Widow- chief's wife	Wild grass which looked like rice and prepared in the same was as rice. Health properties of water left after soaking maize-natural sugar properties. Wild fruits used as food. Uses of <i>mawuyu</i> . Test for safety of mushrooms. Medicinal properties of food and fruit tree leaves. Preparation and cooking of <i>mabumbe</i> .
25	10	64	Married	Traditional beverages use natural sugar. Health of indigenous food. Cooking rapoko sadza. Time and temperature control. Effects of cooking pots on heat retention of food. Cuts and sharing of road runner. Gathering,

				preparation and cooking wild vegetables. Types of trees not used for firewood to cook food.
26	10	64	Married	Mapfunde, mhunga zviyo use in brewing beer. Preparation of the meal and beer process. Preparation and cooking of dried pumpkin leaves in peanut butter. Drying period and storage place. Reasons for cooking okra and when to add tomatoes.
27	10	60	Widow	Preparation, cooking cow peas and sorghum. Preparation and cooking tender <i>mapudzi</i> . Preparation and cooking <i>nhopi</i> from (<i>mafere</i>). Preparation, cooking and use of bulb and tubers. Preparation cooking and satiety value of mixture of cow peas, nuts, round nuts and its satiety value. Preparation, cooking of samp beans. Use of (<i>tsaparau</i>), cow peas, roast maize for thicken sauces. Wild cucumbers preparation and use as butter and use in <i>nhopi</i> . Wooden plates- and serving food effects.
28	10	64	Married	Wild tubers preparation and cooking. Preparation and cooking of black jack. Medicinal properties of black jack and other wild vegetables. Use of salty properties of some plants. Consistencies of different pep types and effects on taste and satiety. Cooking sadza to achieve the best quality in doneness. How to determine the doneness of sadza. Preparation and cooking of road runner. Cooking pot for road runner. Preparation of sour porridge meal.
29	10	66	Married	Cooking dried vegetables. Preparation and cooking time for indigenous vegetables. Use of small tomatoes (<i>tukuzungu</i>) for cooking dried vegetables- taste and flavour. Drying wild fruits. Medicinal properties of <i>mazondo</i> .
30	10	68	Widow	Health effects of indigenous cuisines. Achieving quality characteristics of <i>sadza</i> . Wild vegetables harvesting/picking, preparation and cooking. Preparation of (<i>mazondo</i>). Preparation and cleaning of road runner and cooking.
31	10	69	Married	(<i>Mabumbe</i>) specialist. Health effects of indigenous foods. Used in children's porridge and beverages. Use of oil in cooking. Okra types, preparation and cooking. Use of soda (<i>utyora</i>) (determining quantity). Preparation and cooking soya beans bread. Field and garden vegetables preparation and cooking. Wild animals cooking methods. Preparation of mixed maize, cow peas, nuts, round nuts (<i>mutakura</i>).

32	10	65	married	Cooking pumpkin leaves without oil. Extracting oil from (<i>mapudzi</i>) and pumpkin seeds. Preparation and cooking (<i>mabumbe</i>). Preparation of roast maize pulp/ snack (<i>mbwirembwire</i>), pumpkin seed roast.
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5.2. The history of food and eating in the areas visited.

The first question sought to establish the history of foods and eating in the areas where data was collected, which gives the root of the local food and resultantly, the Zimbabwe cuisines in the areas under research. The history of food from the two areas under study were consolidated and the following major findings were derived: food was in abundance, important, had meaning, shared, used to give medication, had healing properties, used as an exchange of labour and had specific quality attributes. A close analysis of these themes shows that the indigenous culinary claims are derived from these.

Food was said to be always available and found in abundance from natural sources, therefore accessible to every family. Food was enjoyed by everyone, with people sharing, using it for health reasons and for special ceremonies as it had meaning. In summary, it can be said that food had a history of being very important in communities such as Zaka and Magunje, which may apply to the whole country, Zimbabwe. Though still important, its importance has been diluted by modernisation, commoditisation and use of technology. These results indicated that the importance of food was the major point surrounding all the aspects of food which the interviewees mentioned. These findings on the importance of food can be summarised as catering for the physiological, social, psychological and economic needs of society. Even today these needs apply, though the value attached to the social aspect today is different.

Through probing, the researcher was able to get information on how knowledge about food was shared. Indications were that the sharing was not that formal and was also a continuous process. In most cases the sharing was through observation, when elders carried out the processes, for the girl child in particular. The girl child was generally interested as they prepared themselves for womanhood making duties of food preparation and cooking part of important knowledge to be acquired. Others said that it was the duty of mothers, aunties and grannies to make sure that the knowledge was transferred to their family members, while the community did their part through shared chores, such as fetching wood. One of the respondents said this:

Going to fetch fire wood in groups, then was an opportunity to acquire knowledge about the trees are used for cooking, and also the skills on how to arrange the fire wood into a bunch (svinga), tie so that they can be carried home.

The platforms such as those which involved ‘working together’ (*nhimbe*) and ‘rain-making ceremonies’ (*mukwerera*) were some platforms where those who had the skills would be in a position to showcase themselves while others learn. After all, such occasions were for those who had the best skills. The next section will present the respondents understanding of indigenous food, dishes or cuisines.

5.3 Understanding of indigenous food/ dishes/ cuisines.

The interviewees were asked their understanding of indigenous foods or cuisines. This approach was supported by extant literature according to Burk (2016) and This (2013), that it is important to understand the type and nature of food used to determine cuisine authenticity. Various responses were given from which the following themes were obtained: foods eaten from long ago with ancestors, local indigenous foods, foods locally produced. Other responses were: foods processed and cooked using traditional ways and using peanut butter and not cooking oil. The way they explained concurred with most definitions of indigenous cuisines, and in particular to Reinders et al, (2019), who explained indigenous foods as those foods produced locally and everything including preparation methods done according to that culture. They are also consumed as part of the traditional diet. Interviewees revealed that indigenous foods were locally grown foods, wild fruits, vegetables and insects used by the indigenous people. An interesting point was raised by one 72 year old respondent who explained indigenous foods by citing from the Bible:

God created food for people to live on and enjoy and in Zimbabwe we were blessed with an abundance of such foods, which we have shunned. We are resorting to those brought into Zimbabwe by foreigners.

The examples of indigenous foods given concur with other studies which show indigenous foods being from abundant species of wild fruits, vegetables and animals big and small (Vandebroek and Voeks, 2019; Lee, Lee, Seo & Hong, 2020).

However, many believe that these foods were used by our ancestors and had a cultural meaning attached. Literature has shown many cultures using their local food for cultural reasons. In Eastern Nicaragua, among

the Garifuna, they use alcoholic beverage made from grated cassava roots during festivities, rituals and some healing ceremonies (Coe & Anderson, 1996). Furthermore, they reveal that the daily diet was said to be made up of indigenous cuisines making people strong, satisfy hunger, healthy with vitamins and prevented illness as mentioned earlier. Other respondents go on to say that the food is processed through grinding between two stones (*kukuya paguyo*), prepared in different ways and cooked and mixed in unique ways. These findings concur with Angelopoulos, Schulp and Menezes, (2019, p. 63), who insist that an important feature of food's authenticity is the origin of the ingredients that are used in its preparation. However, the other views were that the foods are cooked until well done and have natural flavours. These findings show that indigenous cuisines have numerous advantages as opposed to non-indigenous ones, with the cultural aspect featuring well in the explanations and all aspects of indigenous foods and cuisine were touched. As a follow up to understanding, the next section gives the major indigenous foods which were used in the areas.

5.4 Major indigenous foods in the locality

Respondents gave the foods which were eaten in the locality. The foods ranged from the cereals which were the staples: (*Rukeza*) finger millet, (*mhunga*) millet, maize. Vegetables such as wild and field, leaf, roots, tubers, then fruits, meats from domesticated animals and game. The foods were categorised as starches, meats, insects, vegetables, tubers, roots, legumes, seeds and beverages. Most vegetables were common in the two districts, with the major difference being that Mashonaland West had more wild vegetables than Masvingo. Literature shows that the foods from the localities are considered central to their respective cuisines (Vandebroek & Voeks, 2019). The results on the indigenous culinary claims derived from the study will follow in the next section.

5.5 Indigenous culinary claims on the preparation and cooking of the indigenous foods.

This section is presents the data on the culinary claims which were described by the respondents in relation to the major indigenous cuisines in Zimbabwe, Masvingo, Zaka District and Mashonaland West, Hurungwe District. Though most of the dishes were the same, some differences were on the culinary claims which were revealed from the study on the preparation and cooking of the indigenous foods. Those findings indicated that the two districts can be identified by their unique methods of preparing cuisines. The differences were from the nature of ingredients available, and the culture of the people. Though some foods were the same, the species would give the difference. An example is that of the Hlangani who settled in

Ward 13 of Zaka. They came with their own foods and culture of eating from Chiredzi, which was adopted by some people in the Zaka area.

Data was collected according to how foods are used in cuisines; that is starchy foods, proteins, vegetables. As a result, presentation of findings will follow the same pattern. The findings revealed that there are indigenous claims related to the processing of ingredients used for the cuisines, claims on the preparation of the food, cooking, and serving. Other areas from which claims were prominent include the equipment used, type of firewood used, cooking temperature and the time required to cook the dishes. Similarly, there were claims on the serving and eating of the food. Since the aim of the study is on the indigenous culinary claims, for cuisine's authenticity and uniqueness, the presentations will concentrate on the claims and not the whole recipe. However, there are some areas where it was important to give a more detailed explanation in order to bring out the claim. A summary of the indigenous culinary claims is presented at the end from which, the hypothesis was formulated for the assaying of those indigenous culinary claims, which is the next objective of the study.

5.5.1 Culinary claims on the processing of cereals.

The cereals finger millet/rapoko, pearl millet, sorghum and maize, were generally processed into meal or malt. From the interviews, findings showed that rapoko was the most popular indigenous cereal. The processing methods for the small grains: rapoko, sorghum and millet were almost the same. There were reasons attached to those preparation processes and methods. The processing methods followed specific techniques, in order to achieve the quality of ingredient expected of the particular meal. Therefore, there are some claims attached to the various stages of coming up with the ingredient used for the cuisines. The following processes were used: threshing (*kupura*), winnowing (*kuurutsa/kupepeteta/kupeswa*), roasting (*kukanga*) soaking (*kunyika/kunika*), pounding (*kutswa/kudzvura*) and grinding (*kukuya*). However, these did not apply to all the grains. For example, rapoko, millet and sorghum were roasted to obtain a certain quality of meal. Sorghum, millet and sometimes maize were soaked, while all types of cereals were pound and ground. The processes will be explained next to show how the ingredient quality was achieved.

5.5.1.1 Threshing.

Threshing was the process of removing or separating the grain from the husk and it was done through working together (*nhimbe or jakwara*). The small grains required thorough extraction from the husks, in order to remove all the chaff, while making sure that the grain does not pick soil from the surface where

the threshing was carried out. The findings showed that the process was best carried out on a flat and clean dwala (*ruware*). The same place was used to thoroughly dry the grain, which was important to prevent grains from breaking down during the processing. One of the interviewees had this to say about the importance of a proper working surface:

Special surfaces were used to prepare the grains, a dwala which was free from sand. If there was no dwala nearby cow dung was used to prepare a surface for that purpose. cow dung would create a suitable sand free surface for processing the grain (Interviewee 9).

The claims attached to proper threshing was to achieve a quality meal. Such a meal would have had all chaff removed, and without any sand, which would produce the cuisine with the correct texture and taste. Furthermore, these findings showed that, the sandy taste associated with rapoko meal was said to be a result of using an unclean dwala resulting in the rapoko picking the sand, which was very difficult to remove afterwards. Even today many people think rapoko sadza has a sandy taste, yet this is a result of careless preparation. Rapoko meal with chaff has a rather bitter taste and a prickly texture that can be felt in the cuisine produced using a meal which was not well processed.

The process of threshing (*kupura*) that is (beating hard), involved beating the cereal to separate seed from the husk. A long thin branch threshing stick (*mupuro*) was used. The findings indicate that the long stick used was not from any tree, but from those trees which have a firm fibre (*gavi*), not giving off strong smells which would spoil flavour of the grain. Such trees were stronger, so did not break easily and did the process very well. The leaves of the branches were strapped off, leaving the sub branches. Many of them were cut and availed, so that when one loses the branches or breaks, one would immediately get another one. The (*musasa*) tree was most recommended. In most cases men did the threshing, because it required a lot of energy input. Women had their own duties on the day, that of winnowing, while others prepared food for everyone. The study also picked that pearl millet had more chaff, than the other grains; thereby, required more attention in the processing. The chaff caused a very uncomfortable irritation when it was in contact with the body during the threshing. Interviewee 16 had this to say about the irritation of the finger millet:

Pearl millet has a lot of chaff, which irritates during the processing. People came prepared by wearing long sleeved clothes, at least to limit direct contact with the skin.

It was important to remove all the chaff hence, there was mention of experienced elderly women whose task was to determine the quality of the well threshed grain. The other claims on proper threshing picked

from the interviews were that not well threshed grain did not give the meal a good colour. Furthermore, the remaining chaff would produce a weak product (*mbodza*). The overall point on threshing, which was the first process, was that it determined the success of the other processes which followed and the general product quality to a greater extent. The process of winnowing was the next process after and during the threshing.

5.5.1.2 Winnowing.

The winnowing process was done concurrently with the threshing process. There was mention by most participants that the process would be quite stressful on a day which was not windy. The wind assisted with the blowing away of the chaff, making the process easier and more efficient. On the other hand, a windy day was not the best day for threshing, so there was every need to compromise. Winnowing was said to remove the threshed chaff from the grain. The major equipment from the responses was the winnowing basket (*rusero*), though others also mentioned the deeper one (*dengu*). This was a women's job and one had to be gifted in that to successfully do it. At times the threshing process was repeated when the grain was found not clean enough after winnowing. The clean grain was then packed into sacks and taken to the granary. Separate granaries for different types of cereals were recommended for better preservation, because the grains deteriorated at different rates. Winnowing was also done to remove the bran after pounding. Small grains processing also involved roasting, which will be explained next.

5.5.1.3 Roasting.

The claims about roasting applied to the preparation of rapoko, sorghum and millet. The findings revealed that the emphasis on roasting was on the use of the correct roasting vessel (*chayenga*), which had the qualities of retaining heat. Furthermore, it was said that roasting was done at a well-controlled low temperature, to prevent burning the grain. The controlling of temperature was done through using wood which produced a certain type of glowing ash. The findings indicated that the major reason for roasting was to burn off the remaining chaff from the grains, while for millet and sorghum roasting was claimed to develop a special flavour synonymous with the sadza prepared with the meal. The importance of the roasting process is noted in the following contribution:

Peal-millet sadza should have that aroma which is developed by properly roasting the grain followed by soaking or using water to pound the millet. The grains should not be burnt because

the taste if affected. A bitter taste is developed when the grains are burnt. A specific colour is expected of pearl millet and sorghum alike.

Flavour was also developed by the roasting, though it was not the major reason for roasting. The process was not expected to change the ingredient colour; therefore, provision of a controlled temperature was emphasised. The uncontrolled temperature was said to spoil the taste and palatability of the product produced from the meal. This implied that the processes were supposed to be taken seriously to maintain the colour, develop taste, flavour and texture expected of the specific meal type.

5.5.1.4 Soaking.

The findings indicated another claim that soaking sorghum, finger millet and maize developed a better flavoured meal. The results showed that there were two methods of soaking. One method was where water was added during the pounding to remove chaff and the other one was where the grain would be soaked in a container for a day or two. The findings were that maize was soaked differently from the small grains. Sorghum and millet were put in a sack which was placed in a drum or any big enough container. Soaking exposed the grain to the fermentation process. The interviewees showed a lot of enthusiasm when they explained that the grain to be used to produce malt was left to soak longer. The long soaking enabled the production of malt, which was used to prepare the fermented beverages (*maheu*) and beer ‘seven days.’ A natural strong alcoholic flavour was developed when the sorghum is soaked (fermentation). Some respondents said that the soaking of sorghum *sadza* and porridge meal was optional, and was necessary for special occasion use. However, every household would always have some meal prepared in this way.

The preparation of a special maize meal (*mudzvurwa*) required the maize to be soaked. The maize was then put in a container, preferably a drum, covered with water and left over two to three days to ferment. The process would soften the grain so that the bran is removed easily. In addition, a certain flavour was also developed which made the mealie meal different from the ordinary straight run processing. However, soaking could take longer where a stronger flavour was required, while there was need for one not to over soak, because the claim was that a bitter taste would develop than a nice sweet and sour like taste expected. One of the respondents expressed the effects of the process by saying:

The pounding process produces a tasty meal, has a nice sour, sweet taste, which makes one continue to eat the sadza prepared from this meal even without any relish. The sadza is very white such that you are satisfied just by looking at it.

When the maize was soaked long enough, it was washed and dried thoroughly before pounding into mealie meal. The next processing method was pounding.

5.5.1.5 Pounding

Respondents mentioned three types of pounding which can be described as slight pounding (*kushokora*), rigorous pounding (*kudzvura*), and pounding to powder. Pounding was done using a pistil and motor, to further remove the chaff and in particular for rapoko it was winnowed first before the next process. Most of the participants said that it was important to pound the small grains slightly after roasting. This pounding was done without much force, and for a short time. The process also continued further cleaning of the grain, removing the chaff, which was burnt off during roasting and any other remaining coating. Rigorous pounding was described as that which removed the bran from the maize during the preparation of the refined mealie meal, of which the bran is then removed by winnowing as explained and described earlier. Those who described the preparation of the maize said that a little water was added during the pounding. However, adding of water during the process had different views on how much and the temperature of water used. The findings indicated that water added during the pounding should be just enough to soften the maize, thus easing removal of bran. Other respondents said that hot water was added at the beginning,, while others said the water was added gradually, but the point was that water was important to soften the grain, making it easier to remove the bran. Winnowing followed, soaking, drying and then pounding to mealie meal. The small grains were then exposed to grinding.

5.5.1.6. Grinding

Grinding was the process of producing the meal from the grains. The study revealed that small grains were ground using two grinding stones, one large and the other small (*guyo nehuyo*) (see picture). The use of the grinding stone was claimed to be the best method, in producing a fine flavourful meal. The method did not expose the flavour to any external flavours, unlike when the diesel driven grinding meal is used. Using a good pair of grinding stones and good grinding skills contributed to the fineness of the meal. In addition, the quality of taste and palatability were enhanced by proper processing and winnowing of the rapoko. However, the specific method used determined the product, and a common characteristic were differences from one region to another. It was found that in Hurungwe, people used larger grinding stones than those used in Zaka. Respondents in Hurungwe claimed that their meal was made finer when grinding stones used were large, though the process would be more strenuous as a result of the weight of the stone.

These findings were supported by studies on the differences which result through the culinary processes, that traditional ingredients and culinary techniques express product authenticity (Lee, Lee, Seo & Hong, 2020; Robinson, 2012). It was very important to produce a quality product as the type of meal had a value attached to it in its use for all traditional rituals (*zvirango*) and most traditional ceremonies. The meal had more traditional connotations attached than other types of meals. Though the process was so laborious, the respondents agreed that they were motivated by the pride of being an African woman and being counted among those who produced the best quality mealie meal. One of the interviewees had this to say about the laborious grinding process:

The mealie meal which was ground by this method gave the woman of those days their pride to produce that precious product. During grinding one would sing songs which would make the process enjoyable (Interviewee 19).

The respondent went on to mention that:

The rhythmic movement of the stone moving up and down the bigger stone crushing the grain added to the enjoyment attached to the process.

Hence, though the process was laborious, the importance attached to the product quality motivated the people then.

5.5.1.7 Other processing methods

There was mention of drying the grains which were exposed to soaking. In particular maize processing of the refined mealie meal (*mudzvurwa*) and the pearl millet and sorghum after soaking. Furthermore, there was emphasis that it was necessary to make sure the grain was thoroughly dry. The participants raised this important claim that when the grain the next processes such as pounding or grinding would be difficult and also not give the best results, that is the correct product fineness. Others said that the meal would be discoloured; that is, it would not come out in its normal and expected colour. Flavour was also said to be lost. Such a product would go bad quickly, as it will continue to deteriorate because of the moisture. An interesting point came out when there was further probing on whether it was possible to dry the product at the mealie meal stage. The view which came from an interviewee was that one would not succeed because drying powders was not as easy as the grain. That interviewee had this to say:

You will be exposing to further damage when you dry the mealie meal. The mealie meal may continue to gain moisture from the atmosphere in the process. The mealie meal is even easily affected by moisture (Interviewer 29).

The findings also revealed that using a meal which did not dry well would produce a sadza, porridge or bread, and generally cuisines, that are weak. Participants expressed that the weak meal was difficult to cook no matter how skilled one was. Prolonged fermentation resulted in sadza which tastes bitter:

It would be weak (mbodza). Even the very skilled cook would not succeed in using such a product. It is so difficult to cook the sadza. The sadza does not have the normal taste and sometime it has an unexpected bitter taste. (Interviewee 29).

It was an interesting finding that the bran removed was not thrown away, but further pounded for use as a porridge ingredient or used as chicken feed. This porridge was claimed to protect children from constipation. There is every need to applaud this type of wisdom within the indigenous women, because the bran dietary fibre, which is important for the peristalsis process. The mealie meal produced through this cumbersome process was used for special ceremonies functions and when the home was to receive special guests. Maize, which was no longer in its best condition was also processed in this manner to improve the quality of mealie meal. Today the same is done, but the final milling is being done at the grinding meal. The meal prepared using this method was said to thicken faster. Similarly, less meal would be used at any given time, therefore, the meal would be used for longer than the types which were not soaked.

The results showed that it was important to follow the methods correctly and every stage done efficiently. In other words, there were no shortcuts. It is from correctly following the processes that the authenticity of the product is brought about. Furthermore, what can be deduced from the processed was that all their method claimed at achieving a specific quality in the ingredient and resultantly the cuisine produced from it. Authentic and unique cuisine were for a specific ethnic group was then produced. Literature has supported the assertion that, the process or style of cooking had a bearing on the authenticity of an ethnic dish (Hamzah, Ab Kari & Othman, 2013; Tsai, Lu, 2012; Zibart, Stevens & Vermont, 1995).

5.6 Culinary claims on cooking sadza

The findings showed that the meal produced from the grains was mostly used to cook sadza and porridge. The major claim was that the quality of the cuisine produced was mainly determined by the quality of ingredient that is 'the meal.' Furthermore, the majority of the sentiments were that cooking sadza using a good ingredient was easier, meaning that a quality meal would make the cooking process easier as reiterated in the previous section. The study also revealed that cooking maize meal sadza was the easiest, thus most popular even today. Even those cooks who were not that good were able to come up with good results, unlike where small grain type cereals are involved. A close analysis of the claims attached to the other types, showed that the small grain sadza has numerous claims attached to its cooking process. The refined maize meal type had more culinary claims attached to it because of its fineness, which include carefully blending, to prevent lumps. In addition, the interviewees said that the meal had a higher thickening characteristic, so one had to be able to determine how much meal to use during the blending stage and the consistency at the end. Though the results showed that the methods were almost the same, there were some differences here and there, which gave the sadza its uniqueness.

Therefore, this presentation and analysis will be on what the study found out on the claims on maize refined vision and the small grains meal: rapoko, sorghum and pearl millet. Eight claims came out of the study finding as follows: Ingredient quality, correct cooking equipment, stirring technique, cooking temperature, Time control, consistency, correct steps of cooking- stage of adding recipe ingredients. It is important to note that some of the claims overlap, because the reasons for a specific process would be as a result of an aspect from another claim. According to Field (2012), cooking is often about combining ingredients to create something completely different. It involves many chemical and physical changes to the food that the cook carefully controls in order to produce the desired result. This was demonstrated by what the elderly women were explaining in relation to how the best sadza is achieved when the method's specifics are followed.

5.6.1 Ingredient quality

The views from the respondents claimed that the quality of ingredient and in this case the way the mealie meal was processed was key coming up with a specific quality product. In addition, one had to process the meal using methods which would produce the ingredient with a specific choice. These findings justify the

uniqueness that can be found in the Zimbabwe indigenous cuisines if these processes were followed in producing the ingredients. More voices were recorded in support of the ingredient quality:

It was crucial to use a well processed mealie meal to come up with a good quality cuisine. Rapoko meal not well threshed produces a weak and rather bitter cuisine. (Interviewee 7).

No matter how skilled one is, one would not make it using a poor-quality product. A white sadza was expected from the special maize meal which was claimed to be refined. (Interviewee 22).

Sadza prepared using the refined meal was special, so was supposed to be well cooked and a quality relish accompanying it, during celebrations. The mother may not assign children to cook, as she may be afraid, they may spoil the special dish. (Interviewee 14).

This was emphasise that the meal was so fine that it required expertise to use it in preparing the dish. In addition, the cuisines prepared were important.

5.6.2 Suitable cooking equipment

The findings showed that the indigenous claims on the cooking of sadza involved using correct or suitable equipment which include: cooking pot, cooking sticks, and an African whisk (*musika*). The claim was that using suitable equipment would help to achieve good quality sadza. Specific equipment would contribute toward the various quality factors. The use of a clay pot was claimed to produce the best quality of sadza than other types of pots. A tasty, well flavoured, finely textured and lump free dish. The special clay pot (*shambakonzi*), was specifically designed to facilitate the cooking technique that was required for rapoko sadza, because of its unique method. The special clay pot has a wide opening which allows thorough cooking or stirring which was described as (*kumona*) by respondents in Hurungwe and (*kukwaya*) by those in Zaka. The circular movement of the cooking stick ensured thorough mixing and cooking of the sadza, which got rid of all lumps. The clay pot also added flavour and retained heat more than other material during and after the cooking process. The whisk (*musika*) facilitated thorough mixing and stirring, during the first stages of cooking the sadza, which prevented lumps. Each household had a variety of sizes of these whisks so that the correct size would be used for the best results. The claim on choosing these whisks and cooking sticks were that they were supposed to be the correct size in terms of the length and thickness in relation to the size of pot.

5.6.3 Correct Cooking temperature.

The study findings revealed that the success of the sadza was in the use of the correct temperature from beginning to end. From what was said by respondents (though all types of sadza required adequate heat) rapoko sadza was claimed to require extreme care on the use of adequate heat during the cooking process. The temperature was supposed to be consistent throughout. Though other respondents said that they would start by blending using cold water, the majority added the meal to hot water, stirring continuously with a whisk to prevent lumps. The stirring is done until the sadza starts to boil *kukwata*, allowing it to cook under the consistent high temperature. There was mention of rapoko sadza requiring the longest cooking time. The aspect of time and temperature was noted by Frost and Mortensen (2011) who opined that special emphasis on time and temperature was important, as one cannot compensate for lower temperature by longer times of cooking and vice versa.

Thorough mixing and allowing enough time to cook are important, so that heat really cooks the starch. Uncooked starch was said to cause bloating. However, the sadza should not burn, because it produces a very bad smell, spoiling the flavour. One of the respondents said, *“If one burns the sadza, the children will lose out, as they will not benefit the enjoyment of the crust, though most did not like the sadza.”* Most sadza types were said to be well done when left on low heat for some time (*kushinyidza*) (*kwekanguvana*) before serving. The claim was to develop the aroma and that consistency one can even feel the first time one touches it, *“Sadza that is exposed to low heat has that aroma and texture expected”* (Interviewee 37). Keeping the sadza on low heat exposed it to the right thickness, while it continues to cook and develop the well-cooked taste (*sadza rakaibva*). The sentiments were that sadza cooked by blending in cold water required exposure to lower heat temperature for some time in order to thoroughly cook it.

5.6.4 Stirring technique.

The findings from this study seem to indicate that the major skill in cooking sadza was stirring. Respondents were of the view that all was centred on how one would really stir during the addition of the meal right from the start, followed by constant stirring during the boiling before the final addition of meal to the continuous stirring and mixing when the meal was being added and cooking to the correct consistency. Upon further probing respondents claimed that thorough mixing prevented and removed lumps. However, stirring was said to be all about mixing the ingredients, water and meal, at the same time allowing heat to cook the sadza. Thorough mixing was actually described as *kukwaya*: done by moving the cooking stick

backwards and forward and side to side and *kumona* is moving the cooking stick in circles like the figure eight used in mixing creamed cake mixtures. The word *kumoma* is commonly used in Zimbabwe. Some describe the whole process of cooking sadza as *kumona*. The implication of using the term is the vigorousness that is required when the stirring is done. Using her hands with vigour illustratively, Interviewee 12 said:

Rapoko sadza requires thorough mixing using a strong cooking stick until it is shiny, covered for some time and mixed again.

Thoroughness in mixing *kukwaya* was emphasised. Signs of a well-done sadza were that the sadza would have a certain sticking characteristic on the cooking stick an indication of starch grains which have gelatinised. The sadza should also be smooth, shiny, with a thin consistency which drips from the cooking stick. That facilitated the dishing out which was done in a stylish manner (see appendix 1). The findings also indicated that well done sadza can be eaten without relish.

5.6.5 Time control

The finding showed that time was an important determining factor of a cuisine quality. On the time factor most participants discouraged the use of the blending method that is where a little meal is first mixed with cold water, followed by adding the boiling water claiming that the method would call for exposing the sadza to a cooking time at the paste stage. Although other respondents were of the view that pearl millet also required cooking time which was long, a close analysis showed that rapoko sadza required the longest cooking time. These sentiments were widely echoed:

Cooking at this stage should be given the right time, being careful not to burn the sadza. It also important to control the temperature at this stage (Interviewee 27).

The cooking time differs from one type to the other. Rapoko and pearl millet require more time at this stage (Respondent 33).

The blending method was said to require even more time on low heat after cooking *kushinyidza*. Cooking time period was very much related to temperature of cooking, because the longer the time the more exposure to heat. Resultantly, a good or poor quality dish would be achieved, depending on how well these were controlled. The motivation for time control was ensuring the starch was well cooked, and achieving the real product results, thoroughly cooked and well-developed taste and texture.

5.6.6 Correct stage of adding recipe ingredients.

The indigenous culinary claim related to a quality product requires carefully following the methods and specifications. According to Beer (2008), the cooking processes that, are the methods, contribute to taste and flavour of cuisine. Findings indicate the need for following the methods carefully, resulting in ethnic authenticity. Water is heated in the pot to a temperature just below boiling point, and then enough meal is added and whisked well continuously until the blend starts to boil. Enough meal to form the paste should be added at once and whisked thoroughly so that it does not have any lumps. The respondents were of the view that the sequence of processes ensured the careful mixing and an expected product. Though the methods were generally the same, most of the interviewees in Zaka emphasised the use of the whisk, in boiling water, while in Hurungwe the use of blending method followed by leaving the sadza on low heat was the common method. This concurs with the point that the traditional cooking method is one of those factors which show the origin of place (Lee et al, 2020).

5.6.7 Consistency

The results revealed that the consistency of sadza was key for product quality. The correct consistency was achieved through experience in addition to careful measuring with the tools used. The interviewees indicated that whatever equipment they used to take the meal from the container it was stored, they knew the measures for specific pot sizes to use. The importance of measuring equipment and ingredient thickening quality to achieve a required consistency was heard from this explanation:

Every cook knew exactly how much to add of each ingredient to achieve the correct consistency. How much depends on type of meal, because others had better thickening consistencies than others (Interviewee 23).

The respondents emphasised the need for tasting with the correct consistency. That is one not too thin. If too thin, a consistency will over boil and in most cases the overall result was production of a weak sadza. Though there were rather different views on the thickness of the finished product, the views from most interviewees showed that rapoko sadza was the thinnest *Usvusvu consistency*. The sadza which drips from the cooking stick. On the contrary maize sadza came in a variety of thicknesses, ranging from mediocre, thick to very thick pastes (*chumubvuwerere*). However, the results acknowledged the fact that the thicker consistencies had a higher satiety value. That sadza was usually cooked for men doing manual work.

The sadza used more meal, so was usually prepared for few people, because it uses more mealie meal. The thick sadza was specifically prepared for men doing hard work. (Interviewee 7).

Contrary to that there were other interesting views that the type of relish determined the sadza thickness. Serving sadza with okra or sour milk required a thicker sadza. The sentiments coming out were that the meal tasted better and that the thickness also facilitated the eating process. The consistency described as that slightly above a thick porridge.

These findings were similar to the Australian Aborigines where consistency was important, as their cuisine gave careful attention to the texture of the food in the mouth besides the overall product quality (Ma, 2015). However, the consistencies can be summarised as: Maize refined, the consistency required was described as thin, but not dripping as the rapoko one. The claim behind that was that the *sadza* tastes better in that consistency and would facilitate the serving which was done using the wooden serving spoon (*mugwaku/chigwaku*). Sorghum seemed to be the thickest-from the small grains; pearl millet thick, and maize-mediocre, while rapoko- the thinnest of all. The thicker the consistency the higher the satiety value. It was interesting to report that the indigenous people would utilise this knowledge to cook their sadza to quite a thick consistency to provide a satiety value to a large number of people. That was also applied to those who were doing hard work which required a lot of energy. The Hurungwe people called the thick sadza (*chimubvuwerere*).

5.6.8 Degree of Doneness

Hands were the best detectors of well-done *sadza* and that applied to all types of *sadza* regardless of meal type used. The degree of doneness was measured first by smoke or steam from the sadza and when served it should not crack on the plate, but remain smooth and glossy. Furthermore, the product was not supposed to stick in the hands, when taken during eating. This is because the sadza is eaten using hands and not forks and knives. In fact, there was mention that well-cooked sadza is hot, meaning the served sadza retains a certain degree of heat. The results also showed that most sadza varieties can be eaten without relish if well cooked.

5.6.9 Serving.

The sadza would then be served using the cooking stick, dripping to form the circular pattern (*hwada*), which should not stick on the cooking stick when being removed. (See appendix 1). Refined sadza, however, tastes better in that consistency and would facilitate the serving which was done using the wooden serving spoon (*mugwaku/chigwaku*). The wooden plate was recommended for serving sadza. It was said to prevent the product from being moist, as it absorbed the water from the sadza, which comes out as the sadza is left for some time. In comparison, metal plates were also claimed to keep sadza hot for longer. With regards to rapoko sadza, the wooden plate was suitable for traditional ceremonies as well. The next section will present the results on the claims on vegetables, which were one of the major relishes used, mainly from wild and field vegetables.

5.7 Claims on vegetables.

The study analysis showed that the indigenous vegetables which had unique methods of preparation were *nyevhe*, cow peas, black jack and pumpkin leaves, *mowa*, *bonongwe* besides the not so common species such as *furanondo*, *kabangubangu*, *karuvanzenzenze*, *mbudzimbudzi*, *katehwekemuramu*, *musungusungu* and others. The findings came up with four major processes in producing vegetable dishes which were said to be important for quality cuisines from vegetables. These processed were: harvesting, preparation before cooking, the cooking itself and their serving.

5.7.1 Harvesting

The study revealed the importance of having knowledge of the wild vegetables; for one to choose the correct one because there are species which may look alike and some may be poisonous. The respondents were of the view that the elders were the best people to harvest the vegetables, because they were said to have the knowledge and skill. Harvesting vegetables required the ability to choose the best quality. Most respondents were of the view that vegetables which were young and tender were the quality to look for when picking. This applies to both forests and fields ones. Besides the fact that some vegetables like *nyevhe* and *mhuuyu*, have a bitter taste (the older the more bitter), the study revealed that older vegetables do not have a good taste. Vegetable picking was described as pinching (*kutswinya*). The claim attached to the pinching according to the interviewees was to get rid of the bitter taste:

When the vegetables are not pinched they become bitter, thus not that enjoyable. Such vegetables like njevhe are not bitter, but have a nice bitter taste (Interviewee 9).

In particular, when picking pumpkin leaves the third and fourth from the tip of the running plant were the best. When the pumpkin plant had many flowers, some were also picked and used together with the leaves. The small pumpkins were also picked as part of the vegetables depending on one's preference. For continued growth and branching of the plant, specifically in plants with so many shoots, the tips were broken to allow the plant to spread more. Most of the vegetables were found during the rainy season resulting in them having a lot of sand. Further probing on this issue revealed that soon after a raining day or episode was not good timing for harvesting vegetables. In addition, there was mention to always look for those without too much sand. However, shaking, and washing the vegetables which will be explained later assisted in removing sand from the vegetables.

5.7.2 Preparation before cooking.

The study revealed that soon after vegetables were harvested, they would undergo some preparations before using them, with the preparation dependent on the type. The analysis showed that vegetables were washed, allowed to swot and dried. When, why and how will be explained when looking at each and every one of these preparations. Drying will be explained first as it is the only method of preserving indigenous vegetables.

5.7.3 Drying.

Drying preserved vegetables for the reason of preventing wastage in times of plenty, thus having the vegetables supplies when out of season. The elderly emphasised the importance of drying vegetables and drying correctly and storing them in a suitable place. Interviewee 22 was recorded saying, "*Drying vegetables sustained many families' lives.*" On the other hand, findings showed that drying was a way of introducing variety in the foods, because it changed and improved the organoleptic factors of indigenous vegetables. Variety was from fresh to various products dried using different methods.

Upon further probing it was found that the respondents were aware that some nutrients were lost during these vegetable preparation methods like drying. Their argument was that the lost nutrients were insignificant. Besides during the cooking, they would compensate for the nutrients and flavour lost during drying by adding some fresh ingredients like tomatoes and peanut butter.

Peanut butter was added to dried vegetables, is rich in nutrients which can be more than those in fresh vegetables. Butter from various type of seeds used are rich in vitamins, as such we cannot say we have lost any nutrients. People used to get stronger by eating vegetables with peanut butter. (Interviewee 18).

This was an interesting area of the study whose justification is supported by literature that argues that indigenous cuisines are healthy (Ivanova, Ivanova & Trifonova, 2017; Kennedy et al, 2022; Okumus, 2013; Tey et al, 2018). Findings have also revealed that indigenous people used all parts of the plant as food to sustain their life and improve their health, as seen by using the leaves, stems, flowers, fruits and seeds.

Drying vegetables, according to this study, was applied to almost all types of vegetables, though there were some vegetables which were generally consumed in their dried form. Such vegetable include: *mhuyu* and some wild okra types. The findings were that the drying method got rid of their strong and rather unwanted bitter taste. It was recommended for those vegetables which had such a taste like *cow peas, nyevhe, furanondo and kabangubangu*. In the same vein, there were some which did not need the boiling before drying. The interviewees expressed the importance of boiling the particular vegetable correctly that is first washing thoroughly to remove dirt and sand. The study found out that the bitter vegetables required a longer boiling period, than the mildly flavoured but without completely taking away that flavour, which gives the vegetables its unique taste. When tomatoes were available, they were added to the vegetables to improve the taste, colour, nutrient content and variety.

Cow peas leaves were dried in a special way which retained their green colour. After washing the vegetables were dipped in boiling water for about 15 to 20 minutes, put in sack or *tswanda* (basket) to dry, and then placed on a high place to dry, for hygienic reasons. Respondents agreed that vegetables should be turned more frequently on the first day, at least every hour for them to dry well and prevent rotting. Turning of vegetables during drying was done using a special stick from *mushonga* tree, which was claimed to improve the flavour and taste of vegetables. One respondent was of the view that the use of this tree did not give any flavour, but was specifically to prevent using any type of tree which would spoil the taste or may even be poisonous. These were the sentiments from some interviewees:

Turning was done using a freshly cut stick from trees. The danger of just getting any tree was that some trees were poisonous and the vegetables would then be poisoned. (Interviewee 32).

On the other hand, a dry tree was also dirt and using hand was not hygienic. (Respondent 27).

Using hands to turn was not efficient in assisting in thoroughly turning and spreading. The use of a stick did not work for large quantity (Interviewee 11).

Participants explained it was at this stage that the cow pea leaves could be formed into balls. This was achieved by rolling the boiled vegetables during the drying process. The rolling was claimed to give them a meaty taste and texture which does well in peanut butter sauce. It was interesting to note that the indigenous people talked about hygiene and its importance, as indicated on hanging or suspending vegetables and discouraging the use of hand and old sticks which could be lying anywhere. The finding showed that pumpkin leaves were popularly dried without boiling because of their soft and tender leaves, which would become more crushed when first boiled. *Mukata* was the name of pumpkin leaves dried without cooking.

5.7.4 Washing

The finding revealed washing was an important process for all vegetables, except in very few cases. Most vegetables were said to be washed to remove sand and any foreign particles. Interviewees submitted that the time of the year when vegetables are in season (rainy season) is when so many insects and worms are also found which habit and feed on the vegetables:

It was a good sign to see insects on the vegetables and indication that they were safe for consumption, was said by: (Interviewee 8).

Sand was mentioned as a common feature on the vegetables, because of the rains and the runner vegetables like pumpkin leaves were more vulnerable. To reduce this vulnerability, some would plant them along garden or field fences so that they will climb. In relation to that scenario, the respondents claimed that pumpkin leaves were not supposed to be washed unless they had sand. Washing the vegetables would make them lose their taste. Their leaves have a thin thread which has a coarsely texture that should be removed. The process was and is still named (*kufurura*).

5.7.5 Swotting

Swotting was important to all vegetables which had a bitter or sharp taste and strong flavour like black jack, the (*mowa*) Pigweed family and cow peas. The process was said to be very effective in reducing the bitter or sharp taste of such vegetables. Finding specified that the length of time for swotting depended on the intensity of bitterness. The more the longer, and the less the shorter, the period. Some vegetables like black

jack required only a day and would then be ready for use the next day, while for other vegetables in just a few hours. The findings of this study acknowledged that these vegetables were prepared in almost the same way and in the fresh and dried form. Pumpkin leaves did not require swotting like most vegetable for the reason that it does not have that sharp or bitter taste.

5.7.6 Cutting.

Most of the vegetables were cooked without cutting; because cutting was said to make vegetables lose their taste. Furthermore, this study showed that pumpkin leaves was the only vegetable which was “cut” (actually they were broken with hands), though in a unique way before drying or cooking because of the size of the leaves, which were generally big, except where the shooting leaves were used. The soft leaves were hand-twisted to break them into small pieces. That prevented them from crushing to a powder when dry or cooking to a soupy texture.

5.8 Claims on cooking vegetables.

The findings reveal that for cooking of vegetables; the quantity of cooking water, adding the vegetables at the correct time, the correct choice of other ingredients such as: salt, soda, herbs and spices, butter and cooking oil and when to add them were key for a quality vegetable cuisine. Similarly, the degree of doneness was mentioned as an important determinant of the vegetable dish outcome. Most of the respondents said that the cooking of dried vegetables involved placing enough salty water to boil first, and then adding the vegetables, which should boil till soft enough, depending on the type of vegetable and whether dried or fresh:

It is just the process of softening vegetables which were cooked before drying, though the process of drying will have contributed to the stringy texture, which is characteristic should be removed during this cooking, indicated (Interviewee 2).

The respondent was explaining the need to cook the vegetable, bearing in mind the drying which was done, and the type of vegetable, because some require thorough boiling to make them soft. The longer they were boiled for drying, the shorter boiling time they required during cooking.

There was mention of using peanut butter or butter from seeds, which was claimed to contribute to the softening of the vegetables. This was a point of wisdom because these butters have fats. When peanut butter

was added to the vegetables two methods were used. The study revealed the commonly used method was where the vegetables were first removed from the boiling pot, leaving the sauce (*mutu*). The peanut butter was added and well stirred to come up with a smooth sauce. It was then time to return the vegetables, allow them to simmer together, so that the vegetables are really soaked with the peanut butter. While the explained method was the commonly used, others would just move the vegetables to the side of the pot, add the butter to the other side, stir well then mix with the vegetable and leave them to cook together.

There was mention from one respondent that for the tougher, more fibrous vegetables there was no problem with adding the peanut butter straight where the vegetables were cooking and stir it in. This seemed a brilliant point since there would be no damage to the texture of the vegetables. With regard to the quantity of butter used, it depended on the family, though most respondents recalled that in olden days large amounts were used. There was also mention by some respondents that the sauce was the relish for the younger babies and children who were still not able to chew the vegetables:

Peanut butter made the relish delicious. Many people liked it. The sauce was also used as relish, even without the vegetables (Interviewee 3).

The claims on the cooking of fresh vegetables showed that the pumpkin leaves would have its unique taste from the method used. A little amount of water was said to be suitable, because of the softness of the vegetables, as a result they take a short time to cook. There was need to prevent overcooking as much as possible in order to develop colour and taste. A closer analysis of the findings showed that the use of soda (*hundi/utyora*) in cooking pumpkin leaves was discouraged. These results differ from today's practice, where the use of bicarbonate of soda in cooking vegetables like pumpkin leaves is like a normal practice. Interviewee 25 discouraged the use of soda in cooking pumpkin leaves by saying:

Soda makes the vegetables too soft. They do not taste as they should and the food will not make one healthy.

Pumpkin leaves were said to lose their taste and texture, thus becoming too soft and leaving diners unable to enjoy this special vegetable.

Pumpkin leaves were one of the vegetables for which it was necessary to remove the vegetables before stirring in the butter because of their soft texture, which would result in them being marshy.

Relish should not look like porridge, as they should be picked during eating. Besides porridge like consistency would not have an appetising appearance (Interviewee 25).

Results showed that the amount of peanut butter used in most fresh vegetables was said to be less than the dried. Furthermore, the soft and mild tasting ones like pumpkin leaves required even less. While the indigenous people used to eat all leaves of the pumpkin family, the study revealed that those of (*mapodzi*, *mashamba*) and germ squash were cooked mixed with pumpkin leaves. The reason which came out was that they have somehow a sweet taste and mixing would disguise that taste. The (*mowa*) varieties and (*bonongwe*) were also mixed with pumpkin leaves to disguise their taste, which was not that inviting to some people. The indigenous people did not use cooking oil to cook pumpkin leaves, but they tasted well. However, a variety of peanut butter types were suitable for most vegetables, though a specific type would give better results to the vegetable.

Peanut butter was recommended for dried vegetables. It was said to refresh the vegetables, counteract some of the strong smells, taste, while increasing the quantity of vegetables and they would also have a high satiety value. Vegetables in peanut butter had a better quality when cooked in a clay pot (*hadyana*) than any other material. The use of peanut butter did not make the indigenous cuisine monotonous. The reasons from the elderly women were that it was not peanuts only which was used, but other types were used, which include: sesame seeds, pumpkin seeds, (*mutetenu*) -mapodzi seeds, (*mashamba*) seeds, wild (*ukaka*) or grown cucumber seeds and other plant seed like (*mapfura*). Variety was achieved from the use of all these seeds for the butter:

The skill in preparing these peanut butter dishes was being able to know the quantity of butter and other ingredients to be used in the vegetable dish. Today other types of butter are rarely used and the peanut butter has too much oil. Excess oil from seed butters was removed, reducing monotony in the food where used. The oil was extracted during the processing and used in preparing other dishes (Interviewees 28).

Interviewee 28 is explaining why the use of peanut butter sauce did not make the cuisine monotonous. It was also interesting to note that these indigenous elders knew the effects of the use of bicarbonate of soda in cooking vegetables. Evidence from that *utyora/hundi* was used only in okra and the pregnant women were not allowed to eat okra. The reason given was that the mother would give birth to an unhealthy baby.

A close analysis is that the bicarbonate used destroys vitamins whose requirements should increase during expectancy.

5.9 Claims on the tubers and roots vegetables

The findings showed that a tuber found in Hurungwe area of Mashonaland had more indigenous culinary claims than other tubers, though some applied to other tubers such as *mupana*, *madhumbe* (yams), *tsenza*, *mufarinya* and sweet potatoes (See appendix 1). The preparation, such as the washing, cutting, how they were added to the cooking pot, amount of water to use and the degree of doneness determined the cuisine quality. Similarly, the claims on tubers and root vegetables were that correct preparation methods followed depended on the specific types. The interviewees indicated that some were even poisonous if not cooked to the correct degree of doneness. However, the respondents concurred that all tubers required thorough washing, removal of all the sand, followed by cutting them.

There was mention of cutting to even sizes for even cooking. Cutting was very necessary for only the larger ones so that they cook faster. Respondents said that tubers have a skin, which was edible and removing it was optional. *Tsenza* has a bitter skin, so it was either removed before cooking or skinned during eating, though it was also eaten raw. The practice of eating them raw was practised more in Zaka than in Hurungwe. One of the interviewees mention that cutting was not necessary even for the large one, citing that they would cook at the same time, provided the large ones were placed first so that they are on the bottom of the pot.

Placing the smaller tender ones bottom would result in them overcooking. The reasoning was that food on the bottom of the pan received more heat, allowing the food to be done at the same time. The same respondent also highlighted that the cut ones would not be tasty. A little salt was added and enough water to cook the food until well cooked, but not overcooked, as they would be mashy. *Manyenya* was said to have a slippery texture like okra and also the hairy prickly taste. Soda was used to get rid of that prickly texture and *bonongwe* soda was said to be the most suitable type. *Manyenya* was used as relish, snack and to accompany tea.

5.10 Claims on pulses and nuts

The use of pulses and nuts served the communities because they could be stored longer than the leafy part of the plants in cuisines. The study also revealed they were also popular because of their versatility. Cow peas, peanuts and the nuts from some seeds were the commonly used.

Cow peas were always available because they were grown together with any crops (intercropping). They were consumed boiled with a little salt, when tender together with their pods as a snack or a simple meal in the afternoon. Dried mixed version of boiled cow peas ‘*mutakura*’ was a very popular dish. The claim behind mixing the different was that they tasted better. Dried whole maize or samp, peanuts, round nuts were the foods mixed with the cow peas to form the claimed delicious, high satiety value and nutrient dense dish. The general view was that it was important to use foods of high quality, which are those without weevils. Furthermore, the interviewees claimed that correct combinations were key. These combinations depended on the family or individual choices. The findings showed that cow peas made the major contributor to the quality of a dish, making it a popular cuisine.

A cuisine dish named *rupiza* was the most popular because of its versatile nature, it could be used as a relish or a meal on its own. *Rupiza* was prepared from cow peas after the bran was removed. Removal of the bran gave the dish a taste which was not bitter, therefore that was the claim on the *rupiza*. According to the interviewees, the major challenge was that the bran was easy to remove:

Removal of the bran required real skill and patience, otherwise some families would go for many days without eating this delicious and nutritious dish. (Interviewee 16).

The secret was on roasting the cow peas, which softened the skin for it to be removed. It was important to roast using good quality equipment and the (*chaenga/rwenga*) was recommended, because of its qualities which are explained earlier. The roasting pan was supposed to be heated to the correct temperature before the cow peas were put in to roast. Using a heated pan prevented the skin from hardening. Roasting was also done to the correct stage. Cooled cow peas were said to be easier to remove the skin than cold ones, while the hot ones would breakdown. The next stage was to crush and the grinding stone was used *guyo/huyo*. Crushing was done without much pressure to prevent them from being crushed to powder. The skins were separated by winnowing after and those with skin on them were removed. This was a very important process to satisfy the claim that removing all skin prevents the dish from being bitter. *Rupiza* made from cow peas without any skin was just delicious, and general quality even in appearance and texture. It was also said

that the correct amount and type of butter used contributed to the tasty quality of the dish. Cooking involved boiling until soft enough so that it can be mashed easily, followed by draining, mashing and addition of peanut butter. *Rupiza* was taken on its own as a single dish meal, as a snack and as relish. It was well known for its flavoured unique taste when well prepared and cooked. The next section shows the claims on meats.

5.11 Culinary claims on the meats

The study revealed that the indigenous cuisines did not have many claims on the meats or protein food 'usavi.' The processes which were important in order to come up with the quality cuisines deduced from the analysis were the same as those on vegetables: preparation, storage, cooking methods, time and temperature control and doneness. Meats-game and domesticated, birds and fowl, small animals such as rabbits and mice then edible insects will be presented and discussed simultaneously.

5.11.1 Meat preparation claims.

The finding reveal that the indigenous people had special methods of preparing their meats. The methods developed different flavours in the meat, thereby providing variety in the cuisines. Meat was dried when it was plenty and the drying also introduced variety in the cuisine. Special types of wood were used in drying, and the storage equipment and all these were claimed to give the meat the best quality. The majority of the respondents mentioned that when meat was slaughtered, it was left to hang over night in the special storage room (*hozi/tsapi*). The following day it was then cut into thin strips (*kuvedzenga*) so that it would dry easily. Drying was done in the kitchen by simply placing on the fire place, followed by hanging it over the centre of the kitchen the next day on specially prepared rail (*mutararo*). The (*mutararo*) was a special place which exposed the meat to continued drying and smoking from the heat and smoke produced from fire in the kitchen. The place also kept the meat safe from dogs and cats. However, the head and legs (*mazondo*) were prepared on the slaughter day and left to cook overnight. The indigenous people recommended the use of a fire flame from (*musasa*) tree to remove the feathers (*kubvura*), as opposed to boiling water. The claim attached to using the particular type of tree was the meat prepared from flame resulted in a thick sauce and had a good flavour developed from the smoke. A good flavour developed from the (*musasa*) tree which does not have a smelly smoke.

The claims attached to the birds and fowl were almost the same. This study uses the free-range chicken (*road runner*) to present findings on the related claims for this category of protein cuisines. It was

interesting to note that the indigenous people acknowledged that the bird was not supposed to be exposed to pressure before slaughter. No proper reason was given, but that it was just not fair on the road runner. An analysis of that is related to the aspect of stressing the bird which results in toughening the meat. Properly handling the fowl so that it did not move its wings, thereby, easily slaughtered. That would also make it bleed well, preventing the blood from spoiling the flesh, resultantly the colour and taste of the cooked product. The interviewees stressed that the entrails were carefully removed to prevent breaking the gall bladder. When broken, the gall bladder would transmit its bitter taste to the whole bird, and spoil its taste.

The feathers were removed by dipping the fowl in boiling water, followed by picking the feathers (*kuundura*). The respondents said that the process of removing feathers was important for cuisine quality. Any feathers left were removed by further cleaning using mealie meal or holding the bird over a flame. Remaining feathers were claimed to cause the whole cooked fowl to have a bad smell. The effect was emphasised in these words from an interviewee:

The fowl furthers causes the whole bird to smell. It is crucial to take every care and patience to remove all of them. After all chicken or duck made part of the special family meals. One's unhygienic practices were revealed by the way the fowl was prepared (Interviewee 27).

Another perspective found claimed that feathers contributed to the thickening of the sauce of the road runner, implying that a few remaining would improve the sauce quality. However, indigenous people have other methods of thickening the sauces. The bird was then exposed to the dripping stage, which also allegedly contributes to its taste and flavour. Dripping was done over the fire place. It was taboo to cook a chicken without exposing it to dripping first. Chicken cuts were important, so the cutting was done without disturbing the important cuts.

The claims on the small animals were based on proper preparation, which was removing the feathers, and intestines. A close analysis of responses showed that most if not all required thorough drying before consuming them. Eating them when not well dried induced vomiting. Vomiting was not good because in most cases when one vomits after taking a specific food, the individual would never like that particular food again. The sentiment from one respondent was that vomiting after taking food was regarded as a bad omen. The respondents were of the view that drying over smoke was the best method which ensured that they were thoroughly dry. Furthermore, smoking was said removed the risk of burning them when one

would use fire. The claim attached to drying mice was that well dried mice produced the best taste and gave them a better keeping quality. Keeping quality of well dried mice was reiterated by this sentiment:

There was need to catch more of these mice, dry them well and store them for use in times of scarcity. It was very practical to keep dried mice for up to a year (Interviewee 16).

These words also refer to the seasonality of mice and how they were availed in times of scarcity. An interesting feature is indigenous people's ability to avail specific foods all year round in a sustainable manner.

5.11.2 Storage of meat.

Where the quantities were substantial, well dried meat of any type was put in a sack for safe storage in the (*hozi*), and large clay-pots-(*gate*) were the commonly storage container. The environment was said to keep the meat from draught. It was interesting to hear that the storage conditions continued to improve on the taste and flavour quality of the meat, while the meat continued to harden in terms of its texture. The hardening effect was solved during the cooking of the meat as explained below.

5.11.3 Claims on cooking meat

The findings showed that cooking fresh meat did not have many unique areas, and the dried meat cooked in peanut butter had some unique claims attached. The interviewees said that fresh meat was boiled for a long enough period to soften it, then fried in its oil and without fat or a little oil added, for the meat which was lean. In cases where the meat had too much fat, respondents observed that indigenous people removed it for use in other dishes. The other reason from the study findings was that people did not consume too much fat. As in all foods with much fat, they removed it and they always tried not to add fat when cooking fatty foods. Tomatoes were added, if they were available, but there was no problem cooking the meat without tomatoes. Some homemade thickeners such as mealie-meal or ground roasted dried maize were used to thicken the sauce. Salt was added when the meat was soft. Salt added earlier was said to toughen the meat, resulting in it taking even longer to cook. Where vegetables were part of the meal, the garden vegetables were added to the meat after the frying and addition of tomatoes allowing the food to cook together. The method was said to give the vegetables that meaty taste. The following voice explained views on mixing the meat with the vegetables:

The garden vegetables do not have that taste in the field and wild vegetable. The only way to make them have a better taste was to mix with the meat. Dried meat also used the same method, where fresh or dried vegetables were added to the meat (Interviewee 30).

However, addition of vegetables to meat was not a common practice in earlier times, and the vegetables were not added to poultry of small animals.

5.12 Cooking poultry, birds and small animals.

Boiling was the method used to cook the road runner. A clay pot or three-legged iron pots were used. The amount of water depended on the age of the chicken. The idea was to boil it until well done, while leaving the flesh remaining intact. The interviewees described as “disastrous” a situation when the chicken is overcooked to the state of mealie meal, which they described as *ubvururu*. Salt should be added when the chicken is about to be done. Frying was then done in own oil, adding a little water in between to extract the oil, while developing colour and flavour. Too much oil was removed in the process leaving just enough, while the rest was stored for later use. During the frying stage heat was reduced, to expose the process to slow cooking in order to achieve the expected product quality.

The chicken should be left to cook well in the clay pot until the sauce is thick and glossy from the extracts of the chicken, or duck, or goose (Respondent 21).

The claim about cooking poultry was that when well prepared, well cooked in a three legged pot in its oil produces a tasty cuisine. Similarly, properly dried mice were eaten as biltong, and the cooking the same as other meats. Findings revealed that small animals did not need boiling because of their natural tenderness, and the drying process partially cooked them. It was a question of preparing the sauce, adding the meat and then exposure to simmering, to mix the sauce well with the meat. Butter prepared from seeds was recommended as the best for the mice sauce for quality taste, flavour and texture because it did not have much thickening characteristics as the peanut butter.

5.13 Claims on edible insects’ preparation and cooking.

The edible insect list from the study was endless and some of the common ones were: (*iswa, swarara, makurwe, madora, harati, hwiza, and majuru*). Most edible insects were regarded a delicacy. However, most respondents said that the process of catching them was taxing. Furthermore, their preparation and storage were not easy. There was mention that one had to be skilful and knowledgeable to be able to catch

or trap them. The seasonality aspect was also mentioned as a contributing factor to their scarcity. Besides, they were not available in amounts which could be dried and stored in large quantities, unlike small animals like mice. The other point from the respondents was that the edible insects did not last long when dried because of their size, while some have large amounts of fat.

Soldier Termites were most popular in Zaka, while those in Hurungwe indicated termites and mopani worms, with varieties such as: *harati* and *masinini*, chuffer beetles *makurwe* and locusts during harvest time. The soldier termites were and still are cuisine with findings showing unique methods of harvesting, preparing and cooking them. They are still a delicacy in the Zaka area though stink bug *harurwa* from neighbouring Bikita district was also utilised and are still a common food. Majuru were harvested using the river weed *nhokwe*, which was no longer available until the people in Zaka, resorted to planting fibres as a substitute for harvesting them.

The process of preparing them was important so that they would not have sand, whose source was the ground where they live. They were prepared by first placing them in water, which made the sand remain at the bottom of the bowl. They are then placed in a heated pan *chaenga* to dry them and cook. The washing water was enough to cook them, since they were mostly going to be roasted in the pan. A slow heat was the emphasis, because termites burn easily, resulting in removing all their taste. Therefore, a low temperature was used and the heating of the *chaenga* to the correct level was the technique involved. The use of low heat in drying and cooking applied to most if not all of these edible insects. When dry oil starts to ooze out, they would then fry well in their oil. A little salt is added to taste.

Some participants mentioned that soldier termites, flying termites and the smaller version of flying termites were some of the insects which were eaten raw. The practice of eating raw food seemed to having been applied to small animals only:

Termites, flying termites were very delicious then when eaten raw. It was fun picking them and eating there and then. They had a good flavour and we enjoyed the oily taste. However, we tasted the rawness of the oil in this food, but on the whole, it was such an experience we are missing. We have become used to eating the cooked ones, so we have almost stopped eating raw insects (Interviewee 5).

The practise of eating raw food is still practiced in Italy. Studies have indicated that Sushi was a small fish eaten raw (Tian, et al., 2018). Adding peanut butter when cooking edible insects was not recommended for

most insects, except for few like dried mopani worms and termites (See appendix 1 for Mopani worms in seed butter sauce). The reasons from the participants were that the insects were too small that they would be absorbed in the sauce and may not feel their taste. However, one participant said that the butter from pumpkin family seeds could be used because it is not that strongly flavoured, and would give the sauce suitable thickening characteristic.

5.14 Claims on butters (*dovi*)

The findings showed that butter from nuts and plant seeds were used in the vegetables and meats. At the same time a close analysis showed that the preparation was supposed to be done following the correct methods and procedures for the best quality to be produced. Good quality butter was key in cuisine quality where it was used. In addition, it was important to choose the correct butter choice to use for the food being cooked, as was mentioned earlier in small animals. Also, correctly adding it and the quantity required depended on the cuisine characteristics expected.

The preparation involved roasting the dried seed to develop colour and flavour, allow cooling, followed by pounding, during which excess oil is extracted. Dried seeds from the pumpkin family such as: *mapodzi* and *mashamba*, required using mature seeds, which are supposed to be well dried and left without any discolouration. There were sentiments that the seeds which were not mature, referred to as: *maperere* would produce a butter which had a weak flavour. Wild cucumber seeds *ukaka* - and the grown cucumber seeds (See picture) were also used. According to those in Hurungwe, seeds were prepared by only pounding to a powder and were suitable for fresh vegetables like *karuvanzenzenze*, *nyevhe*, *furanondo*. In Zaka, *mapfura* seeds nuts, which were obtained after breaking the seeds were said to be a suitable butter to use in porridge for children and sick people. The seed butter had healing properties claims. The participants mentioned that all these seed butter were prepared and used instantly, because they did not have good keeping properties. That was one of the reasons why peanut butter was most popular in its use. Similarly, the seeds were also available in small quantities than peanuts, except where sesame seeds were grown.

5.15 Claims on types and use of indigenous sodium bicarbonate types

There were many views on the types of sodium bicarbonate (*utyora/hundi*) used in cooking food. The study findings indicate that the ash from various plants was used to soften food (breakdown) (*kutyora/kugura*). A close analysis showed that *musekesa* and *mukuma* trees gave the best effects required of the *utyora*. The

sour alkaline taste from such trees has the power to breakdown *kutyorakugura*, and from that effect the names describing the effect were given as “*uyora*” or “*hundi*.” Though the names can be used interchangeably, the *hundi* specifically refers to that using the chuff from processed small grains and in this case standing for the alkaline effect. *Hundi* is the name mostly used in Zaka, while those in Hurunge use the name *utyora*. Dried *budzi* and maize cobs were some of what came out of the findings as some of what was used to make the soda. In Hurungwe, poor man’s spinach (*bonongwe*) stem was cited as used to make sodium bicarbonate. Further probing found that the white stuff on the centre of the stem had the characteristic properties for sodium bicarbonate use. The same was said about the maize cob. The white stuff right on the centre of the maize cob was the actual soda. There was mention of poor man’s spinach having healing properties and was remedial use was on swollen veins. The sodium bicarbonate was used to cook okra and other foods which had the prickly and slippery texture like (*manyanya*). The leaf vegetables were not cooked using sodium bicarbonate.

5.16. Claims on thickening agents and seasonings

The indigenous culinary claims findings also showed that there were some foods which had thickening and seasoning properties. Furthermore, most of the seasoning foods had thickening properties, presenting and discussing them at the same time. According to Vannderbroek and Voeks, (2019), some plants impart a bitter flavour, which is a common characteristic of some African foods and dishes. This supports these study findings. With regards to seasonings, studies done in West Africa indicated that they used a salt from wood ashes to make their food taste (Okty and Sadikoglu, 2017; Zocchi and Fontefrancesco, 2020). According to Carney and Rosemoff, (2011) some plants have properties used as thickening agents for stews and hibiscus or sorrel were examples. Findings from this study were that specific types of soil had which have such properties. The respondents gave some of these foods including the way they were prepared and how they were used to improve the taste and consistency of dishes. The root of a small plant known as (*Tsaparau*) found in Hurungwe was used to thicken sauces 9See appendix 1 for pumpkin leaves sauce thickened by (*tsoporau*). One respondent had this to say about the effects of (*Tsaparau*):

Tsoporau has the same effects as those we are experiencing from the instant soups ‘royco’ we are using these days. The sauce thickens well, making the food have an added nice taste and a glossy appearance. A nice yellowish colour was obtained through the use of this plant. Food will have a better taste, especially if one is able to add the right quantity. (Tsoporau) was very suitable for use in chicken (Interviewee 27).

Roasted maize was pounded on powder, sifted and used to thicken sauces. Yams were also used to thicken sauces.

A small plant known as (*kasauti*) has a salty taste, which was found on wet ground or in wet mountainous areas was commonly used as salt, thus the name. It has a nice salty taste and can even be enjoyed on its own. It was interesting to note that the findings showed that sand from ant heap *pachuru* was added to food to improve its taste, because it gave food its salty taste. The soil was put in water and the water used to cook the food. The use of coarse salt was the common practice for the reason there were claims that it had medicinal properties, like general body strength or chasing away bad spirits. Even today coarse salt is used for self-protection from bad spirits. It was also an interesting finding that the indigenous people were conscious of the effects of consuming too much to one's health:

The coarse salt was added during cooking and there was no room for people to add more salt on the table. That prevented and discouraged people from adding salt on the table. After all the salt would not dissolve in the plate. Today people are adding salt on the table resulting in more high blood pressure cases (Interviewee 28).

This participant was giving her view on the way salt is being used today resulting in the numbers of those with hyper-tension increasing by the day.

5.17 Claims on consistency and texture of cuisines.

The findings showed that indigenous people believe thicker consistencies increased the satiety values of cuisines, while the thinner ones reduced their satiety values. Both thick and thin consistencies were found to be important in indigenous cuisine and they were prepared whenever necessary. A very thin consistency for porridge *usvuvu* was suitable for the sick and the young babies, because it was easier to eat. Medicine was also transmitted to these people through putting it in the food, especially in porridge. The thickest consistency of sadza as mentioned earlier was called *chimubvwerere*. The findings indicated that Hurungwe people favoured the thicker consistencies than Zaka people. This consistency was suitable for doing hard labour because of its higher satiety value, thereby keeping them full for a longer period while doing the hard work. Such a consistency had the disadvantage is that it caused hunger in the family, because one tends to use more mealie meal than for the thinner consistencies. A close analysis also showed that the consistency of a dish had so much to do with the taste of the food and its appearance. The following view explained the characteristic effects of a thick consistency:

The thick sadza was not that appealing, and anyway there was not much need (laughing), for the food had the purpose of satisfying hunger. When men cooked sadza that was there consistency. Generally, men love this consistency. (Interviewee 2).

The consistency of food also facilitated the serving of the food. An example is an almost pouring consistency of rapoko sadza was easily served in the circular manner in Zaka, while the thicker was served in the (*hwada*) way in Hurungwe. The respondents also said that the consistency facilitated eating by individuals for whom the food has been prepared for. For instance thin consistency was for the sick and young babies. A thin porridge which was taken by drinking from a cup when need be.

5.18 Claims on serving combinations

Ibrahim (2019) found that most people expect food to be served on plates and eaten with a knife, fork and spoon. They also take it for granted that certain flavours go together. These findings were supported by studies on ‘flavour pairing’, which showed that, if certain foods are paired some degree of intensity suppression of flavour occurs (Frost and Mortensen, 2011). This’s study findings concur with the Flavour Pairing theory. Suitable foods were indicated by interviewees as making the best combinations for taste, flavour, texture and general enjoyment. Some of the combinations of starches and their relish from the study are shown on Table 5.4 below:

Table 5.2: Suitable serving combinations of starch and relish

Dish/ Relish	Suitable serving combinations
Chicken in its own sauce or in tomato sauce	Rapoko sadza, brown rice or rice sadza, pearl millet
Dried beef, goat	Rapoko sadza
Mice	Sorghum, rapoko or finger millet
Crickets, termites	Sorghum, rapoko or finger millet
Rupiza	Sorghum sadza
Mushroom, dried black jack	Millet, Rapoko, sorghum
All dried vegetables	Rapoko sadza
Cow peas (<i>munyemba</i>)	Rapoko sadza
All fresh vegetables	Maize sadza
<i>Rupiza</i>	Sorghum sadza
Dried mushroom in (<i>runinga</i>) seed butter	Sorghum sadza

Source: Author’s compilation.

5.19 Claims on firewood/fuel type

As respondents explained techniques involved in the preparation and cooking of food there were claims which centred on types of firewood suitable for quality products. These improved the flavour, taste or colour of the food which was being prepared, while those discouraged from use were said to spoil the food or make the food poisonous. The *mutondo/munhondo* and *musasa* were coming out as the trees whose firewood had the best qualities for use in cooking. They were said to provide a fire which burns well, providing medium heat, which cooked food well. Furthermore, respondents said that the heat from the fire was also easier to control to suit the required temperature.

The claims on firewood were very much related to the issue of time and temperature control during the drying and processing of some food as explained in prior sections of this chapter. In addition, the type of firewood determined the intensity of heat it gave regardless of how much is used. The interviewees had this to say about the effects of some types of firewood in cooking:

There are certain trees which are not allowed to be used to make fire to keep ourselves warm. The reason behind was so that people would not use the firewood to cook food, because the food, for its natural taste was spoiled by the smoke. This was because some trees produced a lot of smoke which is also very strong. However, some of the smoke produced by wood improves the flavour of food. Special wood was also suitable for cleaning the mazondo. (Interviewee 29).

The interviewee is explaining that the forbidden firewood smoke would spoil the flavour of food. Choice of firewood was said to be a question of having that knowledge and availability of the best types to use. The interviewees gave some information of how they were able to identify the trees which were not suitable for cooking. Most trees which had a milk sap were not generally used for firewood, as they were taken as poisonous. Examples of some of these trees were *munhonzva* and *muparamhosva*. Such names were even scary and carried ominous connotations, the example of *muparamhosva*, which translates to being susceptible to commit a crime if one uses the tree. Also, *mukava* and *chikarara* were not be used because they were used at the graves. Both districts indicated these trees as forbidden in using as firewood. These findings imply that the heat type was an important contributing factor to the quality of dish.

5.20 Claims on measuring.

The results from the finding showed that the correct proportions of ingredients used were important. While there were no scales and measuring jug, the indigenous people still measured their ingredients using the equipment available in their homes (homely measures). The other scenario was the actual use of hands to measure. There was use of approximations, use of eye measurement and experience which contributed a lot to achieving the correct amounts. The information from respondents suggests most indigenous people used their eyes more than anything else to measure quantities of food during food preparation, “*One would actually gauge the quantity of peanut butter that is enough for the vegetables or any ingredient used to for a specific quality to be achieved*” echoed Respondent 10 from Zaka.

Homely measures such as a teaspoonful, half or quarter bucket, were used, while others said they used a specific cup or plate in theory kitchen. An interesting response, was on the use of a teapot lid to measure sugar. The following were some of the voices to support the measuring methods and techniques used:

When making tea, sugar was measured by the lid of the pot where the tea was prepared.
(Respondent 10).

When I put salt or sugar in my hand, I am able to gauge the correct quantity, though I also taste and add more if necessary (Interviewee 18).

The amount of mealie meal to start the sadza or porridge is known just by approximating. They became so used to their pot sizes to an extent that they had no problems at all with the quantities of ingredients they used. They used their experience. The Experiential theory being one of the study theories was found to be quite relevant to such practices of measuring.

5.21 Claims on equipment

The indigenous people claimed that the use of the correct equipment had positive effects on the quality of product used. Equipment was made from clay and wood and there were claims attached to these materials. (See appendix 1 for some equipment). Clay equipment was said to be suitable for cooking, serving and storing food. The cooking pots, though said to heat up slowly, retain heat well, cooking the food well and developing the taste and flavour expected of well-cooked food. The material used to make the pot did not allow flavours to escape and there was room for slow cooking. Though the pot heated well, food did not

burn easily in these pots, thereby reducing the chance of burnt food. Using a pot which heats well also meant use of less fuel at any given time, as suggested here:

Using just a few firewood was able to cook food until well-cooked when using pots made from clay. The metal pots waste fuel and they also burn food during the cooking process. Indicated (Interviewee 14).

Another view from the findings was that the clay pot was removed from fire and it continued to cook the food on the side of the fire. This was because it retained heat longer.

The use of heat gained when the pot was on the heat is a scientific, concept, referred to as “carry over” cooking. Besides clay pots, findings showed that three-legged iron pots came into use and they had the same properties as clay, which gave almost the same results, though the clay pots gave a better flavour to the food. These cooking pots were an important asset of every kitchen then and even today, though now available in a lighter version:

We also used iron pot which did not burn food. Every household had these iron pots of various sizes to suit the quantity of food to be cooked. Cooking was such a joy, with the use of such pots. They gave a lot of confidence when one used them. (Interviewee 2).

Heat was retained by the iron and clay pots such that food would stay hot longer and carry over cooking was utilised to prevent burning the food and save time and fuel.

Besides giving flavour and taste to food, participants said that these pots were easy to wash, and storage of clay pots contributed to the aesthetic appearance of the kitchen. One respondent brought an interesting point that they were the major kitchen equipment as was also shown by some kitchen walls decorated by drawings of clay pots, while different sizes were neatly placed one over the other on a special place in the kitchen, “A real house wife was seen by the number and sizes of clay pots one had in her kitchen” (Interviewee 21). Therefore, this study tends to shed light on the point that indigenous people used pots which had easier care qualities. The clay pots came in a variety of shapes and size. The interviewees argued that the shapes, besides facilitating the technique of cooking a specific type of cuisine, also had a cultural meaning. The use of clay pots was common in both districts where data was collected. There were also clay saucers (*mbiya*), which were used to serve food and claims on their suitability were the same as those given on the clay pots, though it referred to serving food.

Wooden plates were also used and findings were that they were handy because they absorbed water from served sadza especially, and for aesthetic reasons. Their sizes and shapes contributed to the enjoyment of the food. These findings concur with what was found by Albata (2013) that Australian Aborigines, in their restaurant philosophy, paid attention to size, shape, and colour of bowls to heighten the tactile and sensory quality of food. The *mbiya* contributed to the aesthetics because they were decorated. Cooking sticks were in various size, which suited their technical function and facilitated the desire quality of cuisine. With regards to care of the cooking sticks, the findings were that, they were washed soon after use to prevent discolouration and warping resulting in breaking easily.

The findings were that the clay pots and large gourds were commonly used as storage vessels. Storing food in clay pots was said to prevent air from going in, while dried foods were preserved longer in clay pots provided the container was well covered. Water for drinking, stored in a special clay pot (*chirongo*), would keep it cold and maintain its good taste:

Drinking water kept in this pot tasted as if something was added. There was nothing which disturbed the water, because the clay pot retained the ground soil taste of water. The clay assisted in keeping the water cool (Interviewee 18).

The respondent was explaining how the clay pot was able to keep the water in optimal conditions. A close analysis showed that most interviewees indicated the use of beverages as well in the clay pots. The fermented beverages include *maheu* and beer (*doro/hwahwa*) were stored in *pfuko*, while milk was soured and stored in a *hodzoko* and used from there. Beer fermentation process occurred in larger clay pots *magate*. Another aspect from the participants was that time and temperature control were easier when using clay pots.

Baskets and gourd were also used for storage. Gourds were suitable for the storage of grains, seed for sewing, while sacks were used to store dried vegetables, because they allowed air to circulate. The whisk (*musika*) from (*mutarara*) tree was the best because of its whisky shape, strength and did not give off flavours. Studies in the Mediterranean also reveal use of equipment claimed to cook perfectly and made from wood, ceramic, clay, earthen ware pots, basketry. The oldest, almost unknown now, were probably made of basketwork, and these were followed by others made of clay. Thus, the cereal cooked perfectly. Wooden spoons, ladles, sieves, bowls, plates and other equipment of ancestral cuisine (Oussedik, 2010).

5.22 Claims on eating/Table etiquette

Study finding on claims on eating and table manners were on the how the food was eaten, and the effects of those methods. The findings showed that aspect of food being shared according to age and sex was of importance. However, the quantity of food available was an important consideration. All these and others had claims attached to them. The indigenous people had strict table manners which were followed because some were actually a taboo. The respondents said that the food was served in two plates: one for the starch and the other one for the relish, emphasising the idea of sharing. Boys would eat from the same plate; girls had their own and the father and the mother would share from the same plate. In cases where the family was big, the younger ones would eat on their own.

The importance of washing hands was indicated by most respondents, bearing the fact that hands needed to be clean and moreover, people eat from the same plate. The eldest would start eating and picking meat. In some cases, the mother would give meat to eat everyone for fairness in sharing at the same time exercising authority. Clapping hands before starting to eat, and after, was meant to show respect for those who would have supplied the food and those who have prepared. Drinking during eating was not allowed, so that the stomach would not be filled with water before food is taken in. This indicated that the indigenous people were very much conscious of the importance of food

Boiled green mealies and pumpkins were some of the foods which were served in one plate so that people would pick from there. Mothers showed love and respect to their husbands by shelling nuts for them. These findings are related to the finding on the importance of food, that traditionally food was shared and it had a lot meaning attached to it. Most respondents said that food was eaten with hands in most cases, and at the same time shaped in a special way, especially the sadza to facilitate eating. Eating with hands was not a practice in Zimbabwe only. Other studies have shown so many nations using hands like the Japanese, and many other African countries, for reasons of enjoyment of the food (Albata, 2013; Muchinei and Herbet, 2018). The other way people enjoyed the food was putting food on their palms and then licking it. A dried, roasted, salted and ground maize snack called, (*mbwirembwire*) was eaten by licking from one's hand.

5.23 Claims on health-related aspects of cuisines

While some food taboos forbade the consumption of some foods, the findings revealed that generally the cuisines were generally health related. From the results it was also interesting to note most if not all plants had their medicinal properties, some known and others not, as they were natural foods 'organic'. Cuisine

health aspects from the results indicated those which prevented illnesses, cure diseases, and prevent barrenness and boosting the immune system. Pregnant women were assisted for general health, foetus development and for easy delivery. These findings concur with those from Vandebroek and Voeks (2019) who found that the spider plant *Gynandropsis pentaphylla* has various medicinal properties. Babies, children and the expectant mothers benefited most from these plants. Table 5.5 shows some of the foods and their health benefits.

Table 5.3. Perceived indigenous food health benefits.

Food	Health benefits
Rapoko	Cures HBP, prevents bloating, treats veins (<i>tsinga</i>), general health of the body
Black jack	Normalises blood pressure, blood sugar levels and many other conditions.
Sesame seeds	Natural antioxidant, lowers cholesterol levels and hypertension, prevents certain cancers
Cow peas oil	Preventing high blood pressure
Raw paw paw leaves	Prevents high blood pressure
Moringa leaves	Reducing high blood pressure
Raw banana	Prevents high blood pressure
Edible insects	Strengthens bones
Baobab tree (<i>Mauyu</i>)	Treats varicose veins (<i>ukaka</i>)
<i>Manyanya</i>	Prevents a number of diseases, specifically arthritis

Source: Authors compilation.

5.24 Summary of findings.

The chapter presented the indigenous culinary claims collected from the two districts of Zimbabwe. The aim was to determine the specifications on the indigenous cuisines which were consumed in the study areas, for scientific validation. A brief history of food in the areas was presented to show where the food came from, how it was valued and used. From the findings it can be summarised that food was found everywhere, including forests, fields and domesticated animals. Importance was attached to food, through preserving it, with taboos attached to specific animals and plants, and therefore, were forbidden from being eaten. Food was shared, had meaning, had health properties, used to administer medicines, and was used as an exchange

of labour. Generally, the foods available in the two study areas were the same, with some species of wild vegetables not available in the other area or the food was given a different name. The claims on the quality were based on the specific and unique aspects of cuisine preparation. Though many aspects were the same in the same districts, some differences from the two districts were shown, because of the nature of food available, available equipment and tools, preparation methods, consumption patterns and cultural values attached to food. Results showed that claims were centred on the processing methods such as soaking, roasting, drying, picking and others, which determined the ingredient quality. They were also determined by the cooking methods, cleaning, cutting, mixing, stirring, when to add ingredients and even the choice of ingredients to use. There were also claims on consistencies which were related to satiety value, claims on fuel type, the amount of heat, equipment type, size and quality. The specifications were aimed at producing a specific product of a specific quality, which the indigenous people guarded against jealously. For that reason, they were often reluctant to share.

5.25 Hypothesis for validation of indigenous culinary claims

The following hypothesis were formulated from the results on indigenous culinary claims exploration:

Hypothesis 1. Indigenous processing of small grains affects the organoleptic factors of cuisines produced.

Hypothesis 2. Indigenous method of soaking grains affects the quality of cuisines produced.

Hypothesis 3. Indigenous methods of combining ingredients improve the quality of cuisines.

Hypothesis 4. Indigenous ingredient choice affects the quality attributes dried meats cuisines.

Hypothesis 5. Using indigenous equipment while cooking on fire affects the quality of poultry cuisines.

Hypothesis 6. Indigenous methods of drying vegetables affect the quality of cuisines produced.

Hypothesis 7. Indigenous methods of cooking dried vegetables (equipment choice and ingredient choice) affects the quality of cuisines produced.

Hypothesis 8. The use of different butter types affects the quality of indigenous cuisines.

Hypothesis 9. The use of different sodium bicarbonate types affects the strength of organoleptic factors of indigenous cuisines.

These were tested and the findings will be presented in the following chapters.

5.26 Conclusion

The chapter presented the findings on the collected indigenous culinary claims. These claims were said to give the Zimbabwe cuisines their authenticity and uniqueness. The authenticity which can be derived from the use of indigenous food, which are processed using indigenous methods. These methods should be followed for authenticity resulting in cuisine uniqueness. The preparation, cooking, specific ingredient use, equipment, fuel type, time and temperature control were some of the attributes for quality indigenous cuisines, which the tourists seek. The traditional recipes continue to be an inestimable heritage that should be conserved, studied and not forgotten, but renewal is inevitable and the desire to innovate is legitimate. From these culinary claims, some were picked for assaying to assess their validity. The following chapter will present the findings from the sensory tests done to test the hypothesis, thereby determining the claims' authenticity, thus fulfilling the main objective of the study.

CHAPTER 6

RESULTS AND DISCUSSION ON ASSESSING THE VALIDITY OF INDIGENOUS CULINARY CLAIMS

6.1. Introduction

This chapter is focused on presentation, analysis and the interpretation of results on the fourth objective of the study. The objective aimed to assess the validity of indigenous culinary claims through conducting an assay of the indigenous culinary claims. The indigenous culinary claims were assessed on the different effects of food processes, preparation and cooking. Specifically, the processing of small grains meal, use of different methods of drying vegetables, mixing foods, butter types, effects of sodium bicarbonate types in cooking, fire types, equipment types, which included: Nine sensory evaluation tests were done, covering the major claims from the indigenous people. For details of tests see (Table 6.1).

Table 6.1 Sensory evaluation tests

Test	Claim evaluated	Food used	Cuisine used	Samples
1	Effects of processing (roasting, winnowing, pounding, and grinding using stones) on small grains meal cuisines.	Figure millet meal	Rapoko sadza	1.Sadza using unprocessed meal. (No roasting, winnowing, pounding, and ground at the grinding meal). 2. Sadza using processed meal (roasting, winnowing, pounding, and grinding using stones).
2	Effects of soaking on sorghum meal cuisines.	Sorghum meal	Sorghum porridge	1. Porridge using meal prepared without including soaking. 2. Porridge prepared using meal soaked during preparation.
3	Effects of mixing indigenous foods	Meal prepared from cow peas, peanuts and pearl millet powders.	Mixed meal Porridge	One sample of porridge.
4	Effects of peanut butter and cooking oil in cooking dried meat.	Dried beef	Stewed dried beef in peanut butter sauce cooking oil and in.	1. Dried beef stew in peanut butter. 2. Dried beef stew in cooking oil.

5	Effects of cooking equipment and fuel types Iron pot and enamel and firewood and electricity use.	Free-range chicken.	Stewed free-range chicken.	1. Road Free-range chicken stew cooked in iron pot on fire. 2. Free-range chicken stew cooked in enamel pot on the electric stove.
6	Effects of different methods of drying vegetables.	Dried <i>nyevhe</i> (Spider flower)	Spider flower relish in peanut butter sauce and in cooking oil.	1. Spider flower in peanut butter. 2. Spider flower in cooking oil.
7	Effects of cooking equipment and fuel types and ingredient choice.	Dried (<i>bowora</i>) pumpkin leaves.	Dried pumpkin leaves in cooking oil and peanut butter.	1. Pumpkin leaves in peanut butter and cooked in clay pot on fire. 2. Pumpkin leaves in cooking oil and cooked in a metal saucepan on an electric stove.
8	The effects of peanut butter types in cooking food.	Peanut butter and pumpkin seed and cucumber (<i>ukaka</i>) butter	Creamed Pumpkins (<i>nhopi</i>)	1. Creamed pumpkin in peanut butter. 2. Creamed pumpkin in pumpkin and cucumber (<i>ukaka</i>) seed butter.
9	The effects of different indigenous sodium bicarbonate types and bicarbonate of soda	Indigenous sodium bicarbonate types and bicarbonate of soda	Okra	1. Okra using bicarbonate of soda. 2. Okra using wood ash (<i>musasa</i> tree). 3. Okra using maize cob sodium bicarbonate.

6.2 Test 1: Sensory evaluation of sadza samples

The sensory evaluation test was based on the hypothesis that, indigenous processing of small grains affects the organoleptic factors of cuisines produced. A specific hypothesis was formulated for each test done however, because different descriptive attributes were used to evaluate the factors. The analysis was done to assess the effects of indigenous processing methods used on the finger millet meal on the organoleptic factors of sadza. Two sadza samples were tested: one prepared from unprocessed finger millet meal (Sample 321), and the other used processed meal (Sample 421). The factors evaluated were appearance, taste, aroma and texture. For each factor the sensory evaluators indicated “yes” or “no” on the 5 given descriptive attributes.

6.2.1 Assessing the appearance of sadza

The appearance of sadza samples from (unprocessed finger millet meal and processed meal) were tested for their appearance, dryness, greasiness, and its being misty and grainy. Table 6.2 shows the McNemar test results.

6.2.1.1 Hypothesis tested

H₀: The proportion of sensory evaluators who found sadza appearance to be appetising, dry, greasy, misty and grainy when sadza was cooked using unprocessed meal and that cooked using the processed meal is the same.

Table 6.2. Appearance of sadza results.

Appetising (unprocessed meal sadza)	Appetising (Processed meal sadza)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	36	4	0.004 ^b
No	18	6	
Dry (unprocessed meal sadza)	Dry (unprocessed meal sadza)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	2	4	0.125 ^b
No	0	58	
Greasy (unprocessed meal sadza)	Greasy (unprocessed meal sadza)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	0	2	1.000 ^a
No	1	61	
Moist (unprocessed meal sadza)	Moist (unprocessed meal sadza)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	

Yes	0	2	1.000 ^a
No	5	59	
Grainy (unprocessed meal sadza)	Grainy (unprocessed meal sadza)		0.019 ^a
	Yes	No	
Yes	0	15	
No	4	45	

Note: 1. Results are based on: a) McNemar Test b) Binominal distribution used. 2. Sig. ($p < .05$). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < .01$ -Low evidence, $0.01 \leq P < .05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.2.1.2 Sensory evaluation results for appearances of sadza.

More of the sensory evaluators found the appearance of the processed meal sadza appetising and moist, while less of the sensory evaluators found the appearance of the processed meal sadza dry, greasy and grainy. This showed that indigenous methods used to process small grains meal produces sadza which has an appetising and moist, appearance which is not dry, greasy and grainy. The significance test results rejected the null hypothesis on appetising (p-value 0.004) and grainy (p-value 0.019) as they were less than 0.05, so these attributes were statistically significant. The evidence effect was also very strong to moderate according to Cohen' effect size ranking. On the descriptives dry (p-value 0.125), moist (p-value 1.000) and greasy (p-value 1.000) the p values were greater than 0.05, therefore, the study failed to reject the null hypothesis that the proportion of sensory evaluators who found sadza appearance to be dry, moist and greasy when the sadza was cooked using unprocessed meal and when cooked using the processed meal is the same. The effect size was low to absent of evidence against the null hypothesis that: The proportion of sensory evaluators who found sadza appearance to be appetizing, dry, greasy, misty and grainy when the sadza was cooked using unprocessed meal and when cooked using the processed meal is the same. These results indicated that processing of finger millet meal has significant effects on the appearance of the cuisine (sadza) being appetizing and being grainy, while other attributes like the dryness, moistness and greasiness are not affected significantly.

6.2.2. Assessing the taste of sadza.

The taste of sadza was evaluated using the following descriptive attributes: tasty, salty, bland, savoury and undercooked. Table 6.3 shows the McNemar test results.

6.2.2.1 Hypothesis tested

H₀: The proportion of sensory evaluators who found sadza taste to be tasty, salty, bland, savoury and undercooked using unprocessed meal and using the processed meal is the same.

Table 6.3 Taste of sadza results

Tasty (Unprocessed meal)	Tasty (Processed meal)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	22	6	0.002 ^a
No	24	12	
Salty (Unprocessed meal)	Salty (Processed meal)		0.125 ^b
	Yes	No	
Yes	2	6	
No	1	55	
Bland (Unprocessed meal)	Bland (Processed meal)		0.019 ^b
	Yes	No	
Yes	2	15	
No	4	43	
Savoury (Unprocessed meal)	Savoury (Processed meal)		0.791 ^b
	Yes	No	
Yes	3	6	
No	8	47	

Undercooked (Unprocessed meal)	Undercooked (Processed meal)		0.045 ^b
	Yes	No	
Yes	60	4	
No	4	60	

Note: 1. Results are based on a) McNemar Test b) Binominal distribution used. 2. Sig. ($p < .05$). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < .01$ -Low evidence, $0.01 \leq P < .05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.2.2.2 Sensory evaluation results for the taste of sadza

The results on the sensory evaluation of sadza taste showed that more sensory evaluators indicating the processed meal sadza as tasty, not bland and not undercooked while less of the sensory evaluators found the taste of the processed meal sadza salty and savoury. This reveals that indigenous processing of the meal produces sadza which is tasty, not savoury or burnt, not salty, not having a bland taste and the sadza is not undercooked. The statistical significance test results rejected the null hypothesis on the taste being tasty (p-value 0.004) and bland (p-value 0.019) and undercooked (p-value 0.045) as these p values were less than 0.05, meaning these attributes were statistically significant. The effect size was moderate to strong as the p-values were ranging between $p \leq 0.001$ 0.01. This meant that the taste of the processed meal sadza was more tasty and less bland and not undercooked significantly by using the processed meal. On the descriptive salty (p-value 0.125) and savoury (p-value 0.079) indicated p-values which were greater than 0.05, thus results failed to reject the null hypothesis that proportion of sensory evaluators who found sadza taste to be salty, savoury and undercooked when the unprocessed meal was used and when using the processing is the same. The effect size showed low evidence against the null hypothesis that: The proportion of sensory evaluators who found sadza taste to be tasty, salty, bland, savoury and undercooked using unprocessed meal and using the processed meal is the same. These results indicated that processing has significant effects on the taste of the cuisine (sadza) being tasty, not: savoury, bland, salty and not undercooked.

6.2.3 Assessing the aroma of sadza

The aroma of sadza was tested using the descriptive attributes: rancid, aromatic, musty, savoury and mildy. Table 6.3 shows the McNemar test results.

6.2.3.1 Hypothesis tested

H₀: The proportion of sensory evaluators who found sadza aroma to be rancid, aromatic, musty, savoury and mildy when unprocessed meal is used and when the processed meal is used is the same.

Table 6.4. Aroma of sadza results

Rancid (Unprocessed meal)	Rancid (Processed meal)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	1	0	1.000 ^b
No	0	64	
Aromatic (Unprocessed meal)	Aromatic (Processed meal)		0.005 ^b
	Yes	No	
Yes	32	5	
No	20	7	
Musty (Unprocessed meal)	Musty (Processed meal)		0.824 ^b
	Yes	No	
Yes	5	11	
No	9	39	
Savoury (Unprocessed meal)	Savoury (Processed meal)		1.000 ^b
	Yes	No	
Yes	7	10	
No	10	37	
Mildy (Unprocessed meal)	Mildy (Processed meal)		0.302 ^b
	Yes	No	
Yes	7	10	

No	5	42	
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Note: 1. Results are based on: a) McNemar Test b) Binominal distribution used. 2. Sig. ($p < .05$). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < .01$ -Low evidence, $0.01 \leq P < .05$ -Moderate evidence, $0.001 \leq P < .01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.2.3.2 Aroma evaluation results for sadza

The McNemar tests for aroma results had more sensory evaluators who found the aroma of the processed meal sadza aromatic, while less sensory evaluators found the aroma rancid, musty, savoury and mildy. This implied that the aroma had an aromatic taste, not rancid, not musty, not savoury and not mildy. The significance test results for aromatic were statistically significant (p-value 0.042) as the null hypothesis was rejected as p values were less than 0.05. The effect size was moderate. The other four variables describing the aroma of the sadza: rancid (p-value 1.000), musty (p-value-0.8240), (savory p-value1.00) and mildy (p-value 0.302) had p- values greater than 0.05, so failed to reject the null hypothesis that the proportion of sensory evaluators who found sadza aroma to be rancid, musty, savoury and mildy when processed meal was used is the same. The effect size ranged from absent to low evidence against the null hypothesis and data consistent with the null hypothesis. These results imply processing of the finger millet meal has significant effect on the aroma of the cuisine (sadza) being aromatic, while other attributes like being rancid, musty, savoury and mildy not affected significantly.

6.2.4 Assessing the texture of sadza

The texture of sadza was tested on the descriptive attributes: dry, chewy, soft, tender and grainy. Table 6.3 shows the McNemar test results

6.2.4.1 Hypothesis tested

H_0 : The proportion of sensory evaluators who found sadza texture to be dry, chewy, soft, tender and grainy when unprocessed meal is used and when processed meal is used is the same.

Table 6.5. Texture of sadza results

Dry (Unprocessed meal)	Dry (Processed meal)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	0	4	0.302 ^b
No	1	59	
Chewy (Unprocessed meal)	Chewy (Processed meal)		0.078 ^b
	Yes	No	
Yes	6	18	
No	8	32	
Soft (Unprocessed meal)	Soft (Processed meal)		0.008 ^a
	Yes	No	
Yes	19	8	
No	24	13	
Tender (Unprocessed meal)	Tender (Processed meal)		1.000 ^b
	Yes	No	
Yes	0	4	
No	3	57	
Grainy (Unprocessed meal)	Grainy (Processed meal)		1.000 ^b
	Yes	No	
Yes	1	4	
No	3	56	

Note: 1. Results are based on a) McNemar Test b) Binominal distribution used. 2. Sig. (p<.05). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < 0.01$ -Low evidence, $0.01 \leq P < 0.05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.2.4.2 Sensory evaluation results for texture

The results on the texture sensory evaluation of the sadza samples had more of the sensory evaluators who found the texture of the processed meal sadza soft, while less sensory evaluators found the texture dry, chewy, tender and grainy. The results showed that the texture of the processed meal sadza was soft at the same time not dry, chewy, tender and grainy. The results on the statistical significance test rejected the null hypothesis on the descriptive attribute soft (p-value 0.008) as it was less than 0.05, meaning this attribute was statistically significant. The effect size was strong. Softness is quite a significant attribute of sadza prepared from processed meal. The other four variables describing the texture of the sadza: dry (p-value 0.375), chewy: (p-value 0.078), tender: (p-value-1.000 and grainy (p-value1.000)) had p- values greater than 0.05, failed to reject the null hypothesis that the proportion of sensory evaluators who found sadza texture dry, chewy, tender and grainy after preparing sadza from the processed meal is the same. The effect size was low to absent so more in favour of the alternative hypothesis. These results show that processing of the meal has significant effects on the texture of the cuisine (sadza) being soft, while other attributes like the chewiness, tenderness and being grainy do not have significant effects.

Notes.

Some observations were made during the preparation of effects of the sadza samples. The processed meal sample thickened more than the unprocessed meal sample, when the sadza was blended. Another observation was that more meal was used to cook the sadza sample from the unprocessed meal to achieve the same consistencies of the sadza samples. The processed meal sadza sample was easier to mix in the meal than the unprocessed meal sadza sample. These results revealed that the processed meal has better thickening quality and is hence easier to prepare.

6.2.4.3 Summary and discussion of sadza analysis results

The results to test the effects of the indigenous processing finger millet meal on the appearance, indicated scientifically strong significant effects on the appearance being appetising and grainy, while dry, moist and greasy were statically not significant. The results were an indication that the processing of the grains provide an appetising appearance which is also grainy. However, the statistically not significant results on dry, moist, and greasy were of a low effect. Though of a low effect, these results indicate that there are some differences, even for the dry, moist and greasy appearance of the products emanating from the indigenous

processing method. On the taste of the sadza, the results show that attributes tasty, bland and undercooked were affected by them being statistically significant, while the salty and savoury were not statistically significantly changed by processing. The statistically significant change showed a moderate to strong effect. However, for those attributes not statistically significantly changed, there was an indication of some changes, though the effect size was low, thus more skewed on the alternative hypothesis that the effects of processing on the quality factors is not the same. The aroma results indicated the taste being aromatic statistically significant, while rancid, mildy, musty and savoury were not changed statistically significantly. Though not statistically insignificant, there is evidence of some effect because of the low evidence against the null hypothesis, in favour of the alternate hypothesis. The differences were on being aromatic. The results of the texture showed that a soft texture is significant statistically, while the effects on dry, chewy, tender and grainy were statistically insignificant. However, there were some changes because of the low to absent evidence against the null hypothesis, indicating data being consistent with the null hypothesis.

The results from all the sensory evaluation of the sadza samples indicated that the processing of the finger millet meal changes some attributes of the appearance, taste, aroma and texture of the product. The significant changes were an appetising and grainy appearance, the taste being different in its being tasty, bland but not undercooked, producing an aromatic smell and soft texture. The interesting thing about these results is that those not statistically significant had a low effect size, indicating low evidence against the null hypothesis, meaning some differences were linked to the processing of the grain meal. The chaff which was removed from the processes done to clean the meal, gave the distinct appetising appearance and did not remove the grainy appearance significant of grain products. During the process of removing the chaff, other foreign particles are also removed. The use of proper drying places prevented further particles mixing with the meal, which resulted in tasty aroma and soft texture. The aroma was a result of the roasting which was done and grinding on the dwala, as opposed to grinding at the grinding meal, where the flavour is exposed to several threats.

These results are an indication that the claims about the indigenous processing of small grains having effects on the organoleptic factors are true. The fact that the processed meal thickened more than the unprocessed, was an indication of better thickening quality as a result of the removal of all the chaff, which weakens the meal, and roasting the grain. Roasting of grains forms destrins which have a thickening quality when water is heated. This is a result of OH groups in carbohydrates which allow the polysaccharides (starch) to interact with water through the hydrogen bonds (GNU, 2017). The indigenous claims that processing improves

quality of the meal and resultantly the products are true. Similarly, Egyptians relied on processing grains for sustenance, because they were used for most products like bread, porridge and *fufu* (Abraha, et al, 2018).

6.3. Test 2: Sensory evaluation of sorghum meal porridge

The analysis was done to assess the effects of the indigenous processing methods (soaking) in grain meal preparation on the organoleptic factors of sorghum meal porridge. Two sorghum meal porridge samples were tested: one prepared from soaked meal (Sample 111) and the other one used the meal whose preparation excluded soaking (Sample 222). The null hypothesis to be tested is given below. The strength of flavour and taste were also tested for.

6.3.1 Assessing the appearance of sorghum meal porridge.

The appearance of the sorghum meal porridge was evaluated on it being appetising, greasy and crumbly. Table 6.6 shows the McNemar test results.

6.3.1.1 Hypothesis tested.

H₀: The proportion of sensory evaluators who found porridge appearance to be appetising, greasy, and crumbly when the porridge was prepared using meal prepared without soaking and when prepared using the meal which was soaked is the same.

Table 6.6 Sorghum porridge appearance results

Appetising (Not soaked meal)	Appetising (Soaked meal)		Exact Sig.(2-tailed) (p<.05)
	Yes	No	
Yes	11	5	0.000
No	30	20	
Greasy (Not soaked meal)	Greasy (Soaked meal)		0.004
	Yes	No	
Yes	2	18	
No	4	42	

Crumbly (Not soaked meal)	Crumbly (Soaked meal)		0.163
	Yes	No	
Yes	7	21	
No	12	26	

Note: 1. Results are based on a) McNemar Test b) Binominal distribution used. 2. Sig. ($p < .05$). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < .01$ -Low evidence, $0.01 \leq P < .05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.3.1.2 Sensory evaluation results of the sorghum porridge.

The McNemar test results on Table 6. 6, show that more of the sensory evaluators found the appearance of the soaked sorghum meal porridge appetising, while less of the sensory evaluators found the appearance of the soaked sorghum meal porridge greasy and crumbly. This indicates that indigenous processing method (soaking) grains before producing the meal produces a porridge which has an appearance which is appetising, not greasy and not crumbly. The significance test results were (p-value 0.000) appetising and greasy (p-value 0.004), rejecting the null hypothesis that the proportion of sensory evaluators who found sorghum meal porridge appearance appetising and crumbly when the porridge was prepared using meal prepared without soaking and when prepared using the meal which was soaked is the same. Crumbly statistically significant test had a p-value 0.163, so results failed to reject the null hypothesis that the proportion of sensory evaluators who found sorghum meal porridge appearance to be appetising and crumbly when the porridge was prepared using meal prepared without soaking and when prepared using the meal which was soaked is the same. These results indicate that soaking grains for meal preparation gives an appearance which is more appetising and greasier, while the crumbly appearance is not statistically significant.

6.4. Assessing the texture of sorghum meal porridge.

The texture of the sorghum meal porridge was tested on it being chewy, soft, greasy and grainy. Table 6.7 shows the McNemar test results.

6.4.1 Hypothesis tested for texture.

H₀: The proportion of sensory evaluators who found porridge texture to be chewy, soft, oily and grainy when the porridge was prepared using the meal prepared without soaking and that prepared using meal soaked during processing is the same.

Table 6.7. Sorghum porridge texture results

Chewy (Not soaked meal)	Chewy (Soaked meal)		Exact Sig. (2-tailed) (p<.05)
	Yes	No	
Yes	4	14	0.000
No	13	35	
Soft (Not soaked meal)	Soft (Soaked meal)		0.004
	Yes	No	
Yes	8	13	0.004
No	28	24	
Oily (Not soaked meal)	Oily (Soaked meal)		0.163
	Yes	No	
Yes	0	10	0.163
No	2	54	
Grainy (Not soaked meal)	Grainy (Soaked meal)		0.019
	Yes	No	
Yes	6	20	0.019
No	7	33	

Note: 1. Results are based on a) McNemar Test b) Binominal distribution used. 2. Sig. (p<.05). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < .01$ -Low evidence, $0.01 \leq P < .05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.4.1.2 Evaluation of appearance results

The McNemar test results (Table 6.7) show that more of the sensory evaluators found the texture of the soaked sorghum meal porridge chewy, soft and grainy while less of the sensory evaluators who found the texture of the soaked sorghum meal porridge oily. This shows that indigenous processing method (soaking) grains before producing the meal produce a commodity which has a chewy texture, soft and grainy, and less oily. The statistical significance test results were chewy (p-value 0.000), soft (p-value 0.004) and grainy (p-value 0.019), rejecting the null hypothesis that the proportion of SEs who found sorghum meal porridge appearance to be chewy, soft and grainy when the porridge was prepared using the meal prepared without soaking and that prepared using soaked meal is the same. The effects were moderate, strong to very strong. Oily significant test had a p-value 0.163, so fail to reject the null hypothesis that the proportion of sensory evaluators who found sorghum meal porridge texture to be oily when the porridge was prepared using the meal prepared without soaking and that prepared using meal soaked during processing is the same. These results show that the soaking of grains for meal preparation give a texture which is more chewy, softer and grainy, while the texture of being oily is not changed as the statistically significant value was high. However, the effect was low, showing low evidence against the null hypothesis meaning there is some effect on the oily texture.

6.4.2 Assessing the strength of flavour and taste of the sorghum meal porridge

The strength of flavour and taste were tested on a 5. Likert scale from extremely strong to absent of strength. Wilcoxon ranked tests were used and the results are shown on table 6.8.

6.4.2.1 Hypothesis tested

The strength of the flavour and taste for the sorghum meal porridge prepared using meal prepared without soaking and that prepared using meal soaked during processing is the same.

Table 6.8 Sorghum meal porridge strength of flavour and taste results

Ranks				Test statistics			
		N	Mean Ranks	Sum of Ranks	Z-value	Exact Sig. (2-tailed)	
Flavour Processed- porridge– Flavour Unprocessed porridge	Negative Ranks	48 ^a	28.88	1386.00	-5.496 ^b	0.000	
	Positive Ranks	7	22.00	154.00			
	Ties	13					
	Total	68					
Taste Processed porridge– Taste Unprocessed porridge	Negative Ranks	53 ^a	28.87	1530.00	-6.341 ^b	0.000	
	Positive Ranks	3 ^b					66.00
	Ties	12 ^c					
	Total	68					

Note: 1. Results are based Wilcoxon signed rank test. 2. Results are based on either positive or negative ranks. 3. Mean score is based on a 5-point Likert Scale, (1= extremely strong, 5 = absent of strength). 4. Z-Value is 95% confidence =Z=1.96 and greater than reject the null hypothesis. 5. Sig. (p<.05). The interpretation values for effect size commonly in published literature are: 0.10 - < 0.3 (small effect), 0.30 - < 0.5 (moderate effect) and >= 0.5 (large effect).

6.4.2.2 Sensory evaluation results for flavour and taste strength

A Wilcoxon Signed-Ranks test indicated that the soaked sorghum meal porridge (mean rank = 28.88) was rated as having a stronger flavour than the not soaked sorghum meal porridge. The statistical significance showed a Z-value= -5.496^b and an exact p=value 0.001. These results are based on positive ranks. The Z-value= -5.496^b is greater than 1.96 and is less than 0.05, showing showing statistical significance, therefore rejecting the null hypothesis that the strength of the flavour for the soaked meal porridge and the one prepared from meal which was not soaked during processing is the same. Furthermore, the effect size is small showing low or absence of evidence against the null hypothesis. The results showed that the flavour strength is enhanced by soaking of the sorghum during processing.

The taste results showed that the soaked sorghum meal porridge (mean rank = 28.87) was rated as having a stronger taste than the not soaked sorghum meal porridge. The Z-value = -6.341^b, exact p= value 0.000. These results are based on positive ranks and the hypothetical median is higher, showing some effect. The

p-value is below 0.05 and the Z-value above 1.96, showing statistical significance levels, therefore the null hypothesis was rejected that the strength of the taste for the soaked meal porridge and the porridge prepared from the meal not soaked during processing is the same. At the same time the effect size is small, showing strong evidence against the null hypothesis that the appearance being appetising and greasy were different, with moderate to strong effects.

6.4.2.3 Summary and discussion of analysis of sorghum meal porridge results.

The sensory evaluation test results showed, while crumbly appearance was the same. These results indicated that the soaking of grains for meal preparation gave an appearance which is more appetising and greasier, while the crumbly appearance was not statistically significantly different, though the effect size was low. These result could be because the soaking of the grain makes it clean, giving an appetising, brighter and glossy appearance. The texture difference in being chewy, soft and grainy indicate that the soaked sorghum meal has a certain chewy, soft and grainy texture, which is characteristic of cereals regardless of the soaking which was done. The viscosity impacts the “mouthfeel” of a product providing textural cues perceived by the somatosensory system (Mathew et al, 2018). Oiliness came out as the only statistically insignificant, meaning that the oily texture is still an attribute of the sorghum meal, regardless of it being soaked or not. Soaking of the grain exposed it to of fermentation, where the process of gelatinisation occurs, through cereals absorbing moisture, swelling and bursting (Dutson & Oraett, 2021; Yong, et al, 2021). The process provides some changes to the product because lactic acid and other products are produced, which improve the organoleptic factors. Similarly, Mathew et al (2018), report general improvement in the texture, taste, aroma and elimination of toxic and anti-nutritional factors by the process of fermentation. These results were an indication of the effects of processing by soaking, which supported the indigenous culinary claims that soaking grains provides a product which is different and of better quality. Meal processed by soaking meal was generally used for special occasions and in situations where a special relish was available.

The sensory evaluation results also showed that the soaked sorghum meal porridge had a stronger flavour and taste than the sorghum meal porridge prepared from the sorghum meal which was not soaked. Therefore, these results can be interpreted as indicating that the soaking of grains has significant effects on the organoleptic factors of the products, hence improving the flavour and taste of the product. These results can be supported that the fermentation technique which provides a suitable environment for the lactic acid bacteria to grow, thus imparting an acid flavour to food (Asogwa, et al, 2017). These results were found to

be in support of the indigenous culinary claims about the effects of soaking grains. Soaking has other advantages such as: reducing anti-nutrients, like oligosaccharide and enzyme inhibitors (Izydorczyk, 2005). This has some nutritional benefits. Gnu (2017) insists that this increases the bioavailability of important elements such as iron, zinc. Motarjemi (2012) also points out that the fermented foods have reduced cooking time, increases in shelf life, and general improvement in the texture, taste, aroma, and elimination of toxins (GNU, 2017). Observation results also showed that the soaked meal thickened more, an indication of better thickening qualities because of the viscosity (Izydorczyk, 2005). For this reason, their starch is used to thicken foods, for instance starch gels used in puddings. Therefore, these results indicate that less starch was used each time, showing that the method produced an economical meal.

6.5 Test 3. Sensory evaluation of mixed meal porridge.

The test was done using one sample of porridge prepared from a mixed meal. The experiment was to test the effects of indigenous food combination methods on the organoleptic factors of the porridge. The factors evaluated were: appearance, flavour, taste and texture. The appearance and texture were tested using descriptives attributes, and flavour and texture were evaluated for their strength using a 5. Likert scale from extremely strong to absent of strength. Results for the ranks and test statistics are shown on Table 6.9 and Figure 6.1 below.

6.5.1 Appearance sensory evaluation of mixed meal porridge

The appearance of the mixed meal porridge was evaluated for it being appetising, greasy and crumbly.

6.5.1.1 Hypothesis tested

H_0 . The effects of mixing ingredients for preparing a meal for use in making porridge give the same results on the appearance, greasiness and crumbliness.

6.5.1.2 Sensory evaluation results of the mixed meal porridge.

The one-sample Wilcoxon test (Table 6.9) showed that there was a statistically significant difference in the appetising, greasy and crumbly appearance ($Z=3.000$, $p=1.000$), ($Z=4,661$, $p=0.000$) and crumbly ($Z=2.032$,

p-0.042). The effect size was small and medium respectively. Higher scores were on the sensory evaluators who indicated that the porridge was not greasy than those who said it was greasy, while on the crumbly appearance, more sensory evaluators indicated yes, though the difference was small, as shown in Figure 6.1 above.

6.5.2 Assessing the texture of the mixed meal porridge.

Texture was evaluated using the attributes: chewy, soft, oily and grainy. The results are shown on table 6.9

6.5.2.1 Hypothesis tested

H₀: The effects of mixing ingredients for preparing a meal for use in making porridge give the same results on the texture attributes: chewy, soft, oily and greasy

6.5.2.2 Sensory evaluation results for the texture mixed meal porridge.

The one-sample Wilcoxon test (Table 6.4.2) showed that there was a statistically significant difference in the texture of the porridge on the four attributes: chewy, soft, oily and grainy (Z-3.227, p-0.001), (Z-3.705, p-0.000), (Z-5.857, p-0.000) and (Z-2.988, p-0.003) respectively. The effect size was small and medium respectively. However, the oily results indicated a very high number of SEs indicating no compared to those who indicated yes, as shown in Figure 6.9.

Table 6.9 Mixed meal porridge appearance and texture results.

Category	Factor	Sig p-value	Z-value
Appearance	Appetising	1.000	-0.000
	Greasy	0.000	-4.661
	Crumbly	0.042	-2.032
Texture	Chewy	0.001	-3.227
	Soft	0.000	-3.705
	Oily	0.000	-5.857

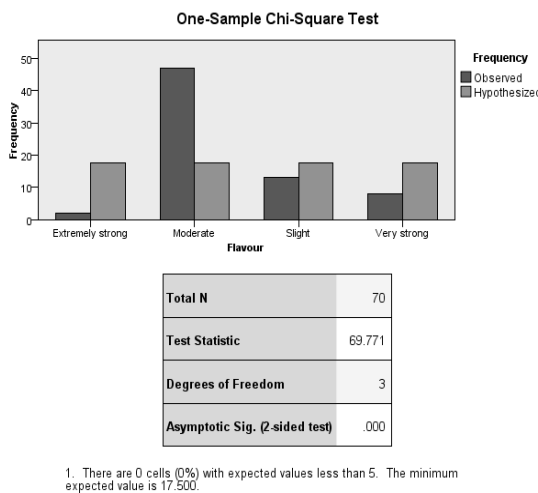
	Grainy	0.003	-2.988
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6.5.3 Assessing the flavour and taste of mixed meal porridge

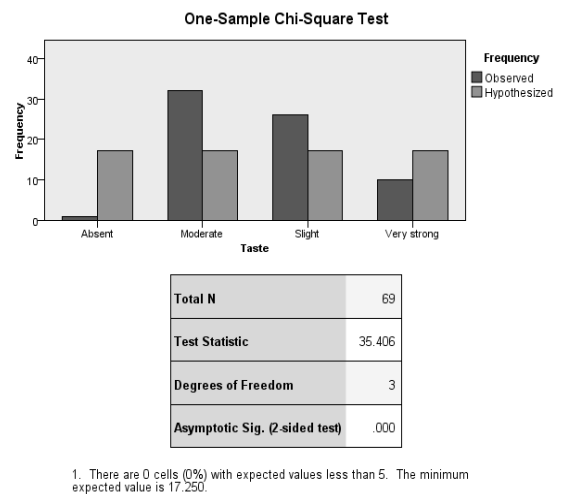
The mixed meal porridge flavour and taste were for their strength using a 5. Likert scale from extremely strong to absent and the results are shown and evaluated on Table 6.11.and Figure 6.3.

6.5.3.1 Hypothesis tested

H₀: The effects of mixing ingredients for preparing a meal for use in making porridge give the same results on its flavour and taste



Flavour ranking



Taste ranking

Figure 6.1 Flavour and taste ranking of the mixed meal porridge

6.5.3.2 Flavour and taste results of mixed meal porridge.

Table 6.4.2 shows that there was a statistically significant difference in the flavour and taste of the porridge (Q69.77, p-0.000) and (Q35.406, p-0.000) respectively. The high ranks for flavour and taste were on moderate.

6.5.3.3 Summary and discussion of mixed meal porridge results

The results showed that the porridge appearance had an appetising appearance which was not different from any other porridge, while its greasy and crumbly appearance were different. However, the greater number of sensory evaluators indicated no to greasy and yes to crumbly (Figure 6.1). These results indicate the quality expected when the meal was prepared, as claimed by the indigenous people. The meal was prepared from a mixture of cow peas, nuts and a pearl millet. However, any grain available was used, with the aim to provide a variety of nutrients in one food for beneficitation purposes. The texture results indicated the attributes of the porridge being different, with more sensory evaluators saying the porridge was not oily and grainy. The meal was prepared to produce a product which was not greasy and crumbly, aiming to make it suitable for weaning children, pregnant women, the aged and the sick. These results reflect the quality, which is light, not much fibre, and an appearance they were used to, while benefiting from the nutrients from the cow peas, nuts and the cereal. Similarly cow peas is said to be rich in high quality protein source, carbohydrates content, relatively low fat content and a complementary amino acid pattern compared to cereal grains. It is also a high-quality plant protein source in many parts of the world. High protein and carbohydrate contents with a relatively low fat content and a complementary amino acid pattern to that of cereal grains is found appealing (Sulemana, Wan, Muhammad Aadilb, Huia, Hopkinsc & Zhanga, 2022). Therefore, providing such foods prevents protein energy malnutrition in children, takes care of the health of expectant mothers, new born babies, the elderly and the sick.

A different flavour was shown by the strength of flavour and taste, which were ranked between moderate to slight. That strength of flavour and taste was appecifically who did not require much energy. Expertise and experience were used to come up with such a meal for preparing the porridge to be fed to children during weaning, the pregnant women, the aged and the sick. Similarly, Spence (2017) opines that food pairing by tradition, region or individuals, are usually based on personal experiences. The same author also insists use of Flavour Pairing theory correctly assists in coming up with quality products.

6.6 Test 4: Sensory evaluation of dried beef.

The test was done using dried beef cooked in cooking oil (Sample 303) and in peanut butter (Sample 404). Tests were done using an 8.point Likert scale to determine the effects of cooking oil and peanut butter on the intensity of juiciness, tenderness and flavour. Juiciness was evaluated from extremely tender to

extremely tough, while the flavour was ranked as extremely intense to extremely bland. Results for the ranks and test statistics are shown on Table 6.12 below.

6.6.1. Hypothesis tested

H₀: The intensity of the juiciness, tenderness and flavour for the dried beef cooked in peanut butter and that cooked in cooking oil is the same.

Table 6.10 Intensity of juiciness, tenderness and colour of dried beef results.

Ranks				Test Statistics ^a		
		N	Mean Rank	Sum of Ranks	Z-value	Exact Sig. (2-tailed)
Juiciness peanut butter Ranks	Negative	8 ^a	27.69	221.5 0	-4.209 ^b	.000
Juiciness Sample cooking oil Ranks	Positive	43 ^b 15 ^c	25.69	1104.5 0		
	Ties Total	66				
Tenderness -peanut butter Ranks	Negative	6 ^a	26.83	161.0 0	-3.775 ^b	.000
Tenderness -cooking oil Ranks	Positive	36 ^b 24 ^c	20.61	742.0 0		
	Ties Total	66				
Flavour intensity -peanut butter Negative Ranks		9 ^a	22.50	202.5 0	-3.959 ^b	.000
Flavour intensity. - cooking oil Ranks	Positive	38 ^b 19 ^c	24.36	925.5 0		
	Ties Total	66				

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Note: 1. Results are based Wilcoxon signed rank test. 2. Results are based on either positive or negative ranks. 3. Mean score is based on a 8-point Likert Scale, Juiciness: (1=Extremely dry,8 = Extremely juicy). Tenderness; (1=Extremely tough,8 = Extremely tender) Flavour intensity (1=Extremely bland,8 = Extremely intense). 4. Z-Value is 95% confidence =Z=1.96 and greater than reject the null hypothesis. 5. Sig. (p<.05). The interpretation values for effect size commonly in published literature are: 0.10 - < 0.3 (small effect), 0.30 - < 0.5 (moderate effect) and >= 0.5 (large effect).

6.6.1.2 Sensory evaluation results for dried beef.

The Wilcoxon ranked test indicated that the dried beef cooked in peanut butter was ranked as having a stronger intensity of juiciness than the dried beef cooked in cooking oil (mean rank=27.69), $Z=-4.209^b$, exact p- value=0.000). The significance p-value is below 0.05, and the Z-value above 1.96, showing statistical significance, therefore rejecting the null hypothesis that the intensity of juiciness of the dried beef cooked in cooking oil and that cooked in peanut butter is the same. The effect size is also small, showing strong evidence against the null hypothesis.

With regards to tenderness of the beef, the results indicated that the tenderness of dried beef cooked in peanut butter was rated as having a stronger intensity of tenderness than the dried beef cooked in cooking oil (mean rank = 27.69), $Z = -4.209^b$, exact p-value 0.000. The Z-value and p-values were below 1.96 and 0.05 respectively, showing statistical significance, therefore rejecting the null hypothesis that the intensity of tenderness of the dried beef cooked in peanut butter and that cooked in cooking is the same. The effect size is small showing strong evidence against the null hypothesis.

Flavour intensity results from the Wilcoxon Signed-Ranks test showed that the dried beef cooked in cooking oil was rated as having a stronger intensity of flavour than the dried beef cooked in peanut butter (mean rank =24.36), $Z =-3.959^b$, exact p-value 0.000. The Z-value is above 1.96 and the p-value of 0.000 is below 0.05, showing statistical significance, therefore falsifying the null hypothesis that the intensity of flavour of the dried beef cooked in peanut butter and that cooked in cooking oil is the same. The effect size is also small showing strong evidence against the null hypothesis.

6.6.1.3 Summary and discussions of results of dried beef.

The results showed that intensity of juiciness and tenderness of dried beef samples were different, with that cooked in peanut butter showing the juiciness and tenderness being a stronger than that of that cooked cooking oil. Flavour intensity results were also different with that for beef cooked in cooking oil being stronger than that of beef cooked in peanut butter. The use of peanut butter could be the contributing factor to the tenderness. When the beef was stewing, the peanut butter penetrated into the dried meat making it softer and tenderer. Similarly, Pannier et al., (2014) indicate that the juiciness of meat is influenced by the amount of water and fat retained after the product is cooked, while the degree of doneness also influences meat juiciness. However, cooking oil has the hardening effect, and thus the sample where it was used was not as tender and juicy as the control. In dry methods of cooking such as frying, grilling and roasting cooking oil is used to develop the brown colour and aroma (McGee, 2016). Maillard reaction occurs when proteins react with carbohydrates and other volatile substances when the meat is exposed to heat (Tyagi, Kharkwal & Saxena, 2015). These reactions are the main contributors to the flavour and taste of meat, as the meat was exposed during the drying process. These results concur with Walingo (2008), who indicates that generally the meat's flavour was developed during drying, besides prolonging storage. The beef cooked using cooking oil had a stronger flavour, because of its contribution to the browning effect. The nutty flavour of the peanut butter, could have dominated, hiding the beef flavour and taste (McGee, 2016). With the small effect size on all the attributes that means the effects are different, the effect sizes are also small, showing strong evidence of differences in the intensity of the flavour and taste attributes. These findings were an indication that using peanut butter in cooking dried beef enhanced the juiciness, tenderness and flavour of the cuisine. The indigenous women proposed using low temperatures for a long time for the development of flavours in the cooking of the dried meat. This concurs with (Mcgee 2016) who contends that emphasis of the intrinsic flavours of foods is contingent on avoiding high temperatures that create the intense but less individualised browning flavours.

6.7 Test 5. Evaluation of the free-range chicken sample.

Free-range chicken was cooked in an iron pot on fire (Sample 550), and the other cooked in an enamel saucepan on an electric stove (Sample 660). The organoleptic factors: juiciness, tenderness and flavour intensity were evaluated on an 8. point Likert scale. Juiciness was rated from extremely juicy to extremely

dry, while tenderness intensity was rated from extremely tender to extremely tough. Flavour was ranked from extremely intense to extremely bland. Results for the ranks and test statistics are shown on tables 6.13.

6.7.1. Hypothesis tested

H₀: The intensity of the juiciness, tenderness and flavour for the free-range chicken cooked in an iron pot on fire and that cooked in an enamel saucepan on stove is the same.

Table 6.11 Results for the free-range chicken results.

Ranks	Test Statistics ^a				
	N	Mean Rank	Sum of Ranks	Z-value	Exact Sig. (2-tailed)
Juiciness -cooked in iron pot on fire Negative Ranks 13 ^b 23 ^a Positive Ranks 16 ^c Ties 52 Total		18.58 18.46	241.50 424.50	- 1.527 ^b	.137
Tenderness- cooked in iron pot on fire Negative Ranks 18 ^a 18 ^b Positive Ranks 16 Ties 52 Total		21.00 16.00	288.00 378.00	-.768 ^b	.409
Flavour intensity-cooked in iron pot on fire Negative Ranks 33 6 ^a Positive Ranks 13 Ties 52 Total		20.27 18.50	669.00 111.00	- 4.000 ^b	.000

Note: 1. Results are based Wilcoxon signed rank test. 2. Results are based on either positive or negative ranks. 3. Mean score is based on a 8-point Likert Scale, Juiciness: (1=Extremely dry,8 = Extremely juicy). Tenderness; (1=Extremely tough,8 = Extremely tender) Flavour intensity (1=Extremely bland,8 = Extremely intense). 4. Z-Value is 95% confidence =Z=1.96 and greater than reject the null hypothesis. 5. Sig. (p<.05). The interpretation values for effect size commonly in published literature are: 0.10 - < 0.3 (small effect), 0.30 - < 0.5 (moderate effect) and >= 0.5 (large effect).

6.7.1. 1 Sensory evaluation results for free-range chicken.

A Wilcoxon Signed-Ranks test indicated that the free-range chicken cooked in an iron pot on fire was rated as having a stronger intensity of juiciness than the free-range cooked in an enamel pot on the electric stove (mean rank = 18.58), $Z = -1.527^b$, p-value 0.137. The significant test showed a p-value of 0.137, which was above 0.05, and Z value less than, 1.96, showing no statistical significance, therefore the results failed to reject the null hypothesis that the intensity of juiciness of the free-range cooked in an iron pot on fire than that cooked in an enamel pot on the electric stove is the same. The effect size was large showing strong evidence for the null hypothesis. The intensity of juiciness effects of cooking free-range in an iron pot on fire and in an enamel pot on the electric stove were the same.

For the intensity of tenderness, the test indicated that the free-range chicken cooked in an iron pot on fire was rated as having a stronger intensity of tenderness than the free-range chicken cooked in an enamel pot on the electric stove (mean rank = 21.00), $Z \text{ value} = -.768^b$, p-value 0.409. The statistically significant tests showed a p-value of 0.409 and Z-value smaller than 1.96, which warrant failure to reject the null hypothesis that the intensity of tenderness of the free-range chicken cooked in an iron pot on fire that cooked in an enamel pot on the electric stove is the same. The effect size was moderate showing moderate evidence for the null hypothesis. Therefore, the intensity of tenderness effects of cooking free-range chicken in an iron pot on fire and in an enamel pot on the electric stove were the same.

With regards to flavour intensity, the Wilcoxon Signed-Ranks test indicated that the free-range chicken cooked in an iron pot on fire was rated as having a stronger intensity of flavour than the free-range chicken cooked in an enamel pot on the electric stove (mean rank = 20.27), $Z = -4.000^b$, exact p-value 0.000. These results are based on negative ranks. The p-value was 0.000. The p-value was smaller and the Z-value above, so the null hypothesis suggesting that the intensity of flavour of the free-range chicken cooked in an iron pot on fire that cooked in an enamel pot on the electric stove is the same was rejected. The effect size was small, showing narrow evidence against the null hypothesis. Therefore, the intensity of flavour effects of cooking free-range chicken in an iron pot on fire and in an enamel pot on the electric stove are not the same.

6.7.1.2 Summary and discussion of free-range chicken results.

The results showed that the intensity of juiciness, tenderness and flavour of the free-range chicken cooked in an iron pot on fire and that cooked in an enamel pot on the electric stove, were not the same. The free-range chicken in an iron pot on fire was rated as stronger in juiciness, tenderness and flavour intensity. When the poultry was cooked several changes occurred. In support of these phospholipids are important in the contribution of the aroma volatiles during the cooking of poultry, though Maillard reaction is one of the main chemical reactions that take place during cooking of meat and poultry (Jayasena, Ahn, Nam & Jo, 2012). Though the effect sizes were large, and moderate respectively, that was enough evidence against the null hypothesis. These results indicate that cooking road runner and other fowl meats in an iron pot intensifies the juiciness, tenderness and flavour of meats. Results support the culinary claims from the indigenous use of such cooking equipment, which was the practice. Such effects give meats the quality expected of a cuisine. Therefore, these results showed that the types of cooking equipment have effects on the quality of the cuisine. The fuel type could have equally contributed to the results. Cooking on fire provides higher temperatures than on the electric stoves, where temperatures are generally controlled. Heat from fire cooks with more intensity, because it heats the cooking vessel from all sides, unlike the stove which receives heat from the bottom only. The free-range chicken can be cooked well on fire as it requires those temperatures to develop its unique taste well. Similarly, it has been noted that poultry from indigenous chicken breeds is a delicacy because of its unique taste and texture compared to commercial broilers (Jayasena et al, 2012). Proteins are responsible for the cooking quality of the chicken as they are denatured, which is explained through these stages. The heated amino acid coils, bond, coagulate, thicken, shrink, become firm and lose moisture. Continued heating makes the proteins tough and drying results, depending on time, temperature and toughness of the meat (Abraha, et al., 2018; Dutson & Oraett, 2021). All this supports the use of different fuel and equipment types for the nature of the product produced.

6.8. Test 6 Sensory evaluation of Cleome gyandra (*Nyevhe*).

The samples of cleome gyandra (*nyevhe*) dried using different methods were used for the sensory evaluations, one which was processed by cooking before drying (Sample 243) and the other dried without cooking (Sample 343) were cooked using the same methods. The samples evaluated the effects of the two drying methods on the colour, flavour, taste and texture of the cuisine. A 7. Likert hedonic scale ranging from least intensive to most intensive was used to rate the intensity of the organoleptic factors.

6.8.1. Hypothesis tested

H₀: The intensity of the flavour, taste, colour and texture for the cleome gyandra (*nyevhe*) dried after cooking and that dried without cooking is the same.

Table 6.12 Results for *nyevhe* tests.

Ranks				Test Statistics ^a	
	N	Mean Rank	Sum of Ranks	Z-value	Exact Sig. (2-tailed)
Colour -dried after cooking Negative Ranks	41 ^a	33.52	1374.5	-2.028 ^b	0.043
Colour -dried without cooking Positive Ranks	24 ^b	32.10	0		
Ties	5 ^c		770.50		
	70				
Flavour- dried after cooking Negative Ranks	34 ^a	30.66	1042.5	-.482 ^b	0.637
Flavour-dried without cooking Positive Ranks	28 ^b	32.52	0		
Ties	8 ^c		910.50		
Total	70				
Taster intensity–dried after cooking Negative Ranks	33 ^d	32.76	1081.0	-.760 ^b	0.453
Taster intensity- dried without cooking Positive Ranks	29 ^e	30.07	0		
Ties	8 ^f		872.00		
Total	70				
Texture- intensity–dried after cooking Negative Ranks	22 ^g	31.75	698.50	-1.855 ^c	0.064
Texture- intensity-dried without cooking Positive Ranks	39 ^h	30.58	1192.5		
Ties	9 ⁱ		0		
Total	70				

Note: 1. Results are based Wilcoxon signed rank test. 2. Results are based on either positive or negative ranks. 3. Mean score is based on a 7-point Likert Scale, (1. Least intensive to 7. Most intensive). 4. Z-Value is 95% confidence =Z=1.96 and greater than reject the null hypothesis. 5. Sig. (p<.05). The interpretation values for effect size commonly in published literature are: 0.10 - < 0.3 (small effect), 0.30 - < 0.5 (moderate effect) and >= 0.5 (large effect).

6.8.1.1 Sensory evaluation results for the nyevhe cuisine.

A Wilcoxon Signed-Ranks significant test indicated that the cleome gyandra dried after cooking had a stronger intensity of colour than that dried without cooking (mean rank = 33.52) $Z = -2.028$, exact p-value 0.043. The p-value is 0.043 was less than 0.05, and Z-value above 1.96, so null hypothesis that the intensity of taste of the cleome gyandra dried after and that dried without cooking is the same was rejected. The effect size was small, showing narrow evidence against the null hypothesis. These results showed that the effects of cleome gyandra dried after cooking and that dried before cooking had a stronger intensity of colour significantly, though it had a smaller difference. These results revealed that the methods of drying give different colour intensity, with the method where the vegetables are dried first developing a darker colour.

A Wilcoxon Signed Ranked significant test indicated that the cleome gyandra dried without cooking was rated as having a stronger intensity flavour than the cleome gyandra dried without cooking (mean rank=32.52, Z -value=-.482^b, exact p- value=0.637). The p-value was larger than 0.05, and the Z-value smaller than 1.96, so the null hypothesis that the intensity flavour for the cleome gyandra dried after cooking was the same as that dried without cooking could not be rejected. The effect size was large showing large evidence for the null hypothesis.

A Wilcoxon Signed Ranked significant test indicated that the cleome gyandra dried after cooking was rated as having a stronger intensity taste than the nyevhe dried without cooking (mean rank=32.76, Z =-.760^b, exact p- value=0.453). The statistical significance test, failed to reject the null hypothesis that the intensity taste for the cleome gyandra dried after cooking is the same as that dried without cooking, since the p-value was greater than 0.05, and the Z-value was smaller than 1.96. However, there was a small effect size, showing narrow evidence against the null hypothesis. Therefore, results indicate that the taste of the dried cleome gyandra versions is statistically significantly the same, though one was ranked higher.

With regards to the texture, the statistically significant test indicated that the cleome gyandra dried after cooking was rated as having a stronger intensity of texture taste than the nyevhe dried without cooking (mean rank=31.75, Z-value=-1.855^b, exact p- value=0.064). The p-value was larger than 0.05, while the Z-value was smaller than, therefore the null hypothesis was not rejected that the intensity of texture for the nyevhe dried after cooking is the same as that dried without cooking. The effect size was small showing narrow evidence against the null hypothesis. These results indicate that the taste of cleome gyandra dried by the two methods is statistically significantly the same.

6.8.1.2. Summary and discussion of Nyevehe results.

Results showed that the colour, taste and texture were ranked higher for the cleome gyandra (*nyevhe*) dried after cooking, while the flavour was higher for that dried without cooking. The vegetables darken when exposed to heat and become even darker with longer exposure, which is the contributing factor to the dark colour. Similarly, Li, et al, (2022) opine that when green vegetables are cooked or exposed to acid, the chlorophyll is destroyed, which changes the colour. The variety which was dried after cooking was exposed longer to cooking and the drying process because that method takes longer to dry than the method of drying without cooking. However the dried vegetables develop a darker colour. (*mufushwa*). Loss of chlorophyll also preserves them and they last longer. Prolonged exposure to heat also develops their intense taste. When the cleome gyandra was being dried, it was sort of molded by rubbing it together, which could be the result of that intense texture. Besides this, moisture absorbed binds the vegetables together and they dry in a stringy shape. The statistically significant results showed the intensity of colour was the only factor, for the cleome gyandra dried without which had a stronger that that dried after cooking. The sample for that without cooking showed statistically insignificant results on flavour, taste and texture of the samples. However, the effect sizes were varied from large, moderate to small respectively. These results showed that flavour, taste and texture are not affected much by using either method of drying the indigenous vegetables. This is because each method produced its own unique flavour, hence the indigenous people used either method for variety and convenience. Drying vegetable is known to expose them to loss of nutrients, but drying under the sun, the method used by the indigenous people, had its own advantages. Chen & Roca (2017), report retention of 39% for ascorbic acid during solar-drying of unblanched cow peas leaves. This may apply to some vegetables, though the percentages may differ. This also support what was mentioned earlier about the loss of chlorophyll.

6.9. Test 7: Sensory evaluation of pumpkin leaves cuisine.

Two samples of dried pumpkin leaves were prepared: one was cooked in a clay pot, on fire and in peanut butter (Sample 661) and the other cooked in an enamel pot on the stove and in cooking oil (Sample 771). The samples were evaluated for the effects of the cooking conditions: equipment, fire and ingredient type. Wilcoxon test was performed to test of the effects of these cooking condition on the intensity of the organoleptic factors: colour, taste and texture, using a 7. Likert hedonic scale ranching from least intensity to most intensive.

6.9.1. Hypothesis tested

H₀: The intensity of the colour, taste and texture for the dried pumpkin leaves cooked in a clay pot, on fire and in peanut butter and that cooked in an enamel pot, on the stove and in cooking oil is the same.

Table 6.13 Results for pumpkin leaves evaluation

Ranks				Test Statistics ^a	
	N	Mean Rank	Sum of Ranks	Z value	Exact Sig. (2-tailed)
Colour: cooked in a clay pot, on fire and in peanut butter Colour. cooked in an enamel pot, stove and in cooking oil	Negative ranks	58 ^b	31.5	-6.221 ^b	.000
	Positive Ranks	4 ^a	8		
	Ties	12	30.3		
	Total	74 ^c	8		
Taste: cooked in a clay pot, on fire and in peanut butter Taste. cooked in an enamel pot, stove and in cooking oil	Negative ranks	55 ^b	32.3	-5.441 ^b	.000
	Positive Ranks	8 ^a	6		
	Ties	11 ^c	29.5		
	Total	73	0		
Texture: cooked in a clay pot, on fire and in peanut butter Texture. cooked in an enamel pot, stove and in cooking oil	Negative ranks	60 ^a	32.6	-6.319 ^b	.000
	Positive Ranks	4 ^b	3		
	Ties	10 ^c	30.5		
	Total	74	0		

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Note: 1. Results are based Wilcoxon signed rank test. 2. Results are based on either positive or negative ranks. 3. Mean score is based on a 7-point Likert Scale, (1. Least intensive to 7. Most intensive). 4. Z-Value is 95% confidence =Z=1.96 and greater than reject the null hypothesis. 5. Sig. (p<.05). The interpretation values for effect size commonly in published literature are: 0.10 - < 0.3 (small effect), 0.30 - < 0.5 (moderate effect) and >= 0.5 (large effect).

6.9.1.1 Sensory evaluation results for pumpkin leaves

A Wilcoxon Signed-Ranks significant test indicate that the pumpkin leaves cooked in a clay pot, on fire and in peanut butter was rated as having a more intensive colour than the pumpkin leaves cooked in an enamel pot, on the stove and in cooking oil (mean rank = 31.58) $Z = -6.221$, exact p-value 0.000. The p-value of 0.000, was less than 0.05 and Z-Value greater, than 1.96, so the null hypothesis that the intensity of colour of the pumpkin leaves cooked in a clay pot, on fire and in peanut butter and that cooked in an enamel pot, on the stove and in cooking oil is the same was rejected. This showed a small effect size, thus small evidence against the null hypothesis. These results were based on negative ranks. Therefore, the results indicated that cooking in a clay pot, on fire and in peanut butter produces pumpkin leaves with different colour intensity to that cooked in an enamel pot, on the stove and in cooking oil.

With regards to taste the Wilcoxon Signed-Ranks test indicated that the pumpkin leaves cooked in a clay pot, on fire and in peanut butter was rated as having a greater intensity of taste than the pumpkin leaves cooked in an enamel pot, on the stove and in cooking oil (mean rank = 32.36) $Z = -5.441^b$, exact p-value 0.000. The p-value is 0.000 was less than 0.05 and Z-value greater than 1.96, so, rejected the null hypothesis that the intensity of taste of the pumpkin leaves cooked in a clay pot, on fire and in a clay pot and that cooked in an enamel pot, in oil and on the stove is the same. The effect size was small, showing small evidence against the null hypothesis. Results indicate that cooking in a clay pot, on fire and in peanut butter produced pumpkin leaves with different taste intensity to that cooked in an enamel pot, on the stove and in cooking oil.

The results for texture intensity of pumpkin leaves indicate that the pumpkin leaves cooked in a clay pot, on fire and in peanut butter was rated as having more texture intensity than the pumpkin leaves cooked in an enamel pot, on the stove and in cooking oil (mean rank = 32.63) $Z=-6.319^b$, exact p-value 0.000. The p-value is 0.000 was less than 0.05 and Z-value greater than 1.96, so, the null hypothesis that the intensity of texture of the pumpkin leaves cooked in a clay pot, on fire and in a clay pot and that cooked in an enamel pot, in oil and on the stove is the same is rejected. The effect size is small, showing small evidence against the null hypothesis. Results indicate that cooking in a clay pot, on fire and in peanut butter produces pumpkin leaves with different intensity of texture than that cooked in an enamel pot, on the stove and in cooking oil.

6.9.1.2. Summary and discussion of evaluation test results of pumpkin leaves cuisine.

The results showed that the intensity of the three attributes: colour, taste and texture were higher for the pumpkin leaves cooked in a clay pot, on fire and in peanut butter than the pumpkin leaves cooked in an enamel pot, on the stove and in cooking oil. The statistically significant tests rejected the null hypothesis for all the attributes. This indicated that the cooking conditions gave different effects on the colour, taste and texture. The clay pot was said to intensify the taste of food, which comes from the clay which always chips away as the pot continues to soften through heating. Naturally, as indicated earlier, cooking on fire exposed food to extensive heat which is well distributed as it is received from the bottom and the sides. The effect is small, showing a small effect of those cooking conditions.

6.10 Test 8. Sensory evaluation of creamed pumpkins.

McNemar test was done to test the effects of using seed butter (Sample 331) and peanut butter (Sample 441) on the appearance of creamed pumpkins. The appearance was evaluated on it being, appetising, colourful, dull, glossy and transparent. For each factor the sensory evaluators indicated “yes” or “no” on the 5 given describing variables. Further evaluation assessed the flavour and taste of the samples on a 5. Likert scale ranging from extremely strong to absent of strength for strength. The results are shown on Tables 6.16.

6.10.1. Hypothesis tested

H₀: The proportion of sensory evaluators who found appearance of creamed pumpkin cooked in peanut butter and that cooked in seed butter is appetising, colourful, dull, glossy and transparent is the same.

Table 6.14. Appearance of the creamed pumpkins.

Appetising (Peanut butter)	Appetising (Seed butter)		Test Statistics Exact Sig. (2-tailed). (p<.05)
	Yes	No	
Yes	14	20	0.061
No	9	22	
Colourful (Peanut butter)	colourful (Seed butter)		0.073
	Yes	No	
Yes	16	25	
No	13	11	
Dull (Peanut butter)	dull (Seed butter)		0.243
	Yes	No	
Yes	1	22	
No	14	28	
Glossy (Peanut butter)	glossy (Seed butter)		0.522
	Yes	No	
Yes	11	17	
No	22	15	
Peanut butter transparent	Seed butter transparent		0.000
	Yes	No	
Yes	2	2	
No	26	35	

Note: 1. Results are based on a) McNemar Test b) Binominal distribution used. 2. Sig. (p<.05). 3. The effect size analysis according to Cohen (2016) $P \geq 0.1$ -Absence of evidence against null hypothesis, $0.05 \leq P < .01$ -Low evidence, $0.01 \leq P < .05$ -Moderate evidence, $0.001 \leq P < 0.01$ -strong evidence, $P < 0.001$ -very strong evidence.

6.10.1.2 Sensory evaluation results of pumpkins

More of the sensory evaluators found the appearance of the creamed pumpkin cooked in peanut butter appetising, colourful and dull, while less found the appearance glossy and transparent. These results showed that peanut butter makes the creamed pumpkins have an appetising appearance, colourful and dull compared to the seed butter. The use of seed butter produces creamed pumpkins which are glossier and more transparent in appearance. The statistical significance test results failed to reject the null hypothesis on four of the appearance descriptives as they were above $p \geq 0.05$: appetising (p-value 0.061), colourful (p-value 0.074), dull (p-value 0.243) and glossy (p-value 0.522). The transparent attribute was the only one which rejected the null hypothesis (p-value-0.000). These results indicate that the use of peanut butter and seed butter in creamed pumpkins gives the appearance that is not statistically significantly different with regards to it being: appetising, colourful, dull and glossy, while the transparency is not the same. The transparency of the creamed butter was the only one affected by using seed butter statistically significantly. The statistically significantly effect was strong $p \leq 0.01$. The effect was from the processing and reaction of the peanuts and seeds to the production process.

6.10.1.3 Sensory evaluation results for assessing the strength of flavour and taste creamed pumpkins

Two samples of dried creamed pumpkins were tested for the effects of different butters on the quality factors, flavour and taste. In sample (331) peanut butter was used, and sample (441) used seed butter. Wilcoxon test was done to test the two effects of the two butter types on the strength of the organoleptic factors using a 5. Likert scale.

6.10.1.4 Hypothesis tested

H_0 : The strength of the flavour and taste of the pumpkin in peanut butter and that cooked in seed butter is the same.

Table 6.15 Results for the pumpkin flavour and taste intensity tests

Ranks				Test Statistics ^a		
		N	Mean Rank	Sum of Ranks	Z	Exact Sig. (2-tailed)
Flavour cooked in peanut butter Colour. cooked in seed butter	Negative Ranks	33 ^a	24.36	804.00	-2.793 ^b	0.006
	Positive Ranks	14 ^b	23.14	324.00		
	Ties	17 ^c				
	Total	64				
Taste: cooked in peanut butter Taste. cooked in seed butter	Negative ranks	43 ^b	23.06	784.00	-4.029 ^b	0.000
	Positive Ranks	9 ^a	18.00	162.00		
	Ties	17 ^c				
	Total	60				

Note: 1. Results are based Wilcoxon signed rank test. 2. Results are based on either positive or negative ranks. 3. Mean score is based on a 7-point Likert Scale, (1. Least intensive to 7. Most intensive). 4. Z-Value is 95% confidence =Z=1.96 and greater than reject the null hypothesis. 5. Sig. (p<.05). The interpretation values for effect size commonly in published literature are: 0.10 - < 0.3 (small effect), 0.30 - < 0.5 (moderate effect) and >= 0.5 (large effect).

6.10.1.5 Sensory evaluation results of flavour and taste of creamed pumpkins.

A Wilcoxon Signed-Ranks test indicated that the flavour for the creamed pumpkins with peanut butter (mean rank =24.36) was rated as having a stronger flavour than the creamed pumpkin with seeds butter (mean rank =23.14), Z = -2.793^b, exact p-value 0.006. These results were based on positive ranks. The p-value is smaller than 0.006, with the Z-value greater than 1.96, so the null hypothesis that the strength of the taste for the creamed pumpkins with peanut nut and that with seed butter is the same is discarded. The effect size was small, showing little evidence against the null hypothesis.

The sensory evaluation results on the taste of the creamed pumpkins with peanut butter was rated as having a stronger taste than the creamed pumpkin with seed butter (mean rank =23.06), Z = -4.0296, exact p-value 0.000. The p-value is smaller than 0.000, and Z-value greater than 1.96, so the null hypothesis that the strength of the taste for the creamed pumpkins with peanut nut and that with seed butter is the same is disavowed. The effect size is also small, showing little evidence against the null hypothesis. The results

were an indication that using the different butters give cuisines which are different in flavour and taste, with the peanut butter giving stronger flavour and taste than seed butter.

6.10.1.6 Summary and discussion of the creamed pumpkins sensory evaluation results

The results indicate that the use of peanut butter and seed butter in creamed pumpkins gives the appearance that is not significantly different with regards to the attributes: appetising, colourful, dull and glossy. This means the butter type's contribution to appearance in terms of being appetising, colourful, dull and glossy is the same. These results could be related to the preparation process which is the same. Both products, peanuts and seeds have oils, which contribute to their glossy appearance. This was supported by Burke and Danaher (2018) who indicate that seeds have a high lipid content, which have essential oils. The transparency was statistically significantly different and it was the only attribute affected statistically significantly by using the two types of butters. The statistical significance effect was strong. Seeds are generally lighter, thus transparent appearance is significant of them, though they differ from one type to another. Sesame seeds are one type with a dark colour. The idea of mixing different seeds to make the butter was practiced to improve the colour, flavour and taste of the butter. The results also indicate the difference in colour and taste results. These results could be attributed to the fact that naturally peanuts have more flesh, which gives the room to be exposed to heat longer during the roasting stage of the butter preparation process. During this stage they develop a darker colour and stronger flavours (nutty aromas) are also developed. On the other hand, seeds, because of less flesh, cannot be exposed to heat longer because they burn easily. The result is a lighter colour and mildy flavour.

However, the results showed that peanut butter and seed butter can be used in cooking, improving the cuisine quality. Seed butter use has been neglected yet nutrient composition analysis of pumpkin seeds showed that they are very nutritious, and provide many essential nutrients for health. In addition, they have been used for medicinal purposes and have therapeutic value (Kalogropoulos, 2013). The use of seeds as butter can be limited because they deteriorate faster. This was supported by Kalogropoulos (2018) who submits that the shelf life of seed butter could be influenced by factors such as lipid oxidation, microbial contamination and texture changes. They have a high lipid content which could be susceptible to oxidation if the product is stored in conditions that favour rancidity (Spence, 2016). What is important, as indicated by the indigenous people, is to choose the suitable type of dish according to suitability, availability and

personal preferences. Similarly, Spence (2016) indicates that considering flavour chemical profiles of the culinary ingredient are the starting point in search for good food combination choices.

6.11: Test 9. Sensory evaluation of effects of different sodium bicarbonate types in cooking okra.

Three samples of okra were prepared to test the effects of using of commercial and indigenous sodium bicarbonate types in cooking. Bicarbonate of soda, *musasa* tree ash and maize cob ash. The intensity of colour, flavour, and taste were tested using Friedman test. The results are shown on Table 6.18.

6.1.1 Hypothesis tested

H₀: There is no difference in the colour, flavour and taste in the okra cooked using the different sodium bicarbonate types.

Table 6. 16. Results for the okra cooked using different sodium bicarbonate types

Descriptive Statistics							Ranks	Test statistics		
Variables	Samples (sodium bicarbonate types)	N	Mean	Standard Deviation	Minimum	Maximum		Mean	Chi-Square	df
Colour	Bicarbonate of soda	49	1.72	.584	1	3	1.79	68.481	2	.000
	Wood sodium bicarbonate	50	1.35	.526	1	3	1.39			
	Cob sodium bicarbonate	50	2.93	.680	2	5	2.83			
Flavour	Bicarbonate of soda	49	2.37	.826	1	4	1.86	48.249	2	.000
	Wood sodium bicarbonate	49	2.15	.666	1	4	1.55			
	Cob sodium bicarbonate	50	3.22 3.24	7.86	2	5	2.59			

Taste	Bicarbonate of soda	50		.834	1	4	2.70	33.097	2	.000
	Wood sodium bicarbonate	48	2.04	.893	1	4	1.42			
	Cob sodium bicarbonate	49	2.43	.736	2	5	1.88			

Note: **df** are the degrees of freedom associated with our test statistic. It's equal to the number of variables we compare - 1. In our example, 3 variables - 1 = 2 degrees of freedom. P-value $\leq \alpha$: 0.05

6.11.1.2 Sensory evaluation results for okra

The mean rank results for the colour of the okra samples were different as; 2.83, 1.78 and 1.39 for maize cob sodium bicarbonate, wood sodium bicarbonate and bicarbonate of soda respectively. The highest mean rank was in colour of the maize cob sodium bicarbonate sample, followed by the bicarbonate, then the wood sodium bicarbonate. The Friedman test indicated the maize cob sodium bicarbonate okra samples having a statistically significant difference between the mean ranks of the related groups, with the p-value of 0.000, ≤ 0.05 , while the Friedman was Q68.481. With those statistics results the null hypothesis that there is no difference in the colour in the okra cooked using the different sodium bicarbonate types, was rejected. Therefore, the different sodium bicarbonate give different colour where they are used, with maize cob sodium bicarbonate giving the darkest colour.

The mean rank results for the flavour of the okra samples were different as; 2.59, 1.86 and 1.55 for maize cob sodium bicarbonate, wood sodium bicarbonate and bicarbonate of soda respectively. The rank was in favour of the maize cob sodium bicarbonate a, followed by the bicarbonate of soda, then the wood sodium bicarbonate. The Friedman test indicated that the okra samples had a statistically significant difference between the mean ranks of the related samples, in that the flavour of the okra samples, with the p-value 000, ≤ 0.05 , while the Friedman's Q 33.097. From these results, the null hypothesis that there is no difference in the flavour in the okra cooked using the different sodium bicarbonate types, was rejected. Therefore, the different sodium bicarbonate types give different flavour where they are used, with maize cob sodium bicarbonate giving an outstanding flavour.

The mean rank results for the taste of the okra samples were different as; 2.70, 1.88 and 1.42 for bicarbonate of soda, maize cob sodium bicarbonate and wood sodium bicarbonate respectively. The highest rank was

in the taste of the bicarbonate of soda, followed by the cob sodium bicarbonate then the wood sodium bicarbonate. The Friedman test indicated that the okra samples had a statistically significant difference between the mean ranks of the related groups in that the taste of the okra samples, with the p-value $0.000 \leq 0.05$, while the Friedman's $Q = 33.097$. From these results the null hypothesis that there is no difference in the taste in the okra cooked using the different soda types was rejected. Therefore, the different sodium bicarbonate give different tastes where they are used, with bicarbonate soda giving the best taste.

6.11.1.3 Observation results for okra evaluation

The bicarbonate of soda sample was the first one to show its effect. What was observed was rising and foaming of froth by the bicarbonate of soda, then the maize cob sodium bicarbonate was next. As the maize cob sodium bicarbonate was rising, it started to thicken and darken while the other samples remained not as dark. The *musasa* soda did not form as much froth and maintained a lighter colour compared to the other samples. However, the froth in the maize cob and *musasa* tree sodium bicarbonate subsided with time. The thickening and darkening could be indications that the maize cob sodium bicarbonate was strongest, then bicarbonate of soda, with *musasa* sodium bicarbonate weakest

6.11.1.4 Summary and discussion of okra samples results.

The results showed that the colour, flavour and taste of the okra cooked using bicarbonate of soda, wood sodium bicarbonate and maize cob sodium bicarbonate were statistically significantly different. The colour and flavour of maize cob having the highest strength, while the bicarbonate of soda had the highest taste strength. These results were an indication that the indigenous sodium bicarbonate (*utyora/hundi*) give varied effects on the quality of the cuisine where they are used. The indigenous sodium bicarbonate were distilled to refine them, which also contributed to their strength. Convenience and variety were key in using those types of sodium bicarbonate. Variety and uniqueness is also achieved through these techniques using different and specific foods (Guler, 2019). It was also important to choose the correct type of okra to use. The okra types which had weaker flavours would call for the use of stronger flavours of sodium bicarbonate, like the maize cob one. Though the ranking was different all sodium bicarbonate types resulted in the expected product as the Sensory evaluation testes expressed their enjoyment of all the samples of okra as they were testing, though at first they showed not much interest in testing the okra. The statistical results agreed with the observation results, which observed the bicarbonate of soda sample first forming the froth and rising the okra, while the maize cob sodium type was next. The maize cob type also formed a lot of

froth, darkening and thickening the okra. The *musasa* cob sample did not form much froth, and had a lighter colour. The effect of sodium bicarbonate is to break down the food, as implied by its indigenous name *utyora* (breaking down). Sodium bicarbonate is an alkaline and it accelerated the breaking down of hemicellulose (Provost, Colabroy, Kelly & Wallert, 2016, p. 20). However, all the sodium bicarbonate types were able to produce a cooked product. All were able to breakdown the okra to the expected soluble state.

6.12 Summary of chapter findings

The chapter aimed to conduct an assay to assess the validity of indigenous culinary claims. Ten hypotheses, each representing claims, were formulated for the sensory evaluation experiments. These results will be summarised and hypothesis answered. The first experiment on the figure millet sadza results, indicated that the processing of the figure millet meal changes some attributes of the organoleptic factors: the appearance, taste, aroma and texture of the product. The processed meal sadza had significant changes on it having an appetising and grainy appearance, the taste being tasty, bland and not undercooked, producing an aromatic smell and texture which was soft. The interest about these results is that those not statistically significant had a low effect size, indicating low evidence against the null hypothesis, indicating some differences were given by the processing of the grain. Observations during the preparation of the sample indication of better thickening quality as well as easier to mixing of the ingredients together. The evaluation of sadza samples were testing the hypothesis whether *processing of small grains affects the organoleptic factors of cuisines produced*. Results indicated that small grain processing affects the organoleptic factors, other significantly and others not.

The sorghum meal tests results indicated that the soaking of grains for meal preparation gave an appearance which was more appetising and glossier. With regards to flavour and taste, results showed that the soaked sorghum meal porridge had a stronger flavour and taste than the sorghum meal porridge prepared from the sorghum meal which was not soaked. Observation results also indicated better thickening qualities, as shown by the blended mixture which was thicker with the same quantity of ingredients used. The evaluation of sorghum meal porridge tested the hypothesis that: *The indigenous method of soaking grains affects the quality of cuisines produced*, which was proved true by these results.

The mixed meal porridge experiments had the appearance not different, and it was not oily and grainy, while the texture was different. The flavour and taste were ranked between moderate and slight. That was the range of flavour expected of the product when it was developed to suit the specific individual needs. Therefore, the hypothesis that *indigenous methods of combining ingredients improve the quality of cuisines*, was proved likewise.

The results of the dried beef indicated that the beef cooked in peanut butter had a stronger intensity of juiciness and tenderness than dried beef cooked in cooking oil. On the other hand, the intensity flavour of dried beef cooked in cooking oil was higher than that cooked in peanut butter. The experiment answered the hypothesis: *Indigenous ingredient choice and cooking methods affect the quality attributes dried meats cuisines*. The results indicated that the use of peanut butter and cooking oil had different results.

Free-range chicken results indicated that the intensity of juiciness, tenderness and flavour of the road runner cooked in an iron pot on fire and that cooked in an enamel pot on the electric stove, were not the same. Furthermore, free-range chicken cooked in an iron pot on fire was rated as stronger in juiciness, tenderness and flavour intensity. The results were in response to the hypothesis that: *Using indigenous equipment while cooking on fire affects the quality of poultry cuisines*. Results indicated that the quality of free-range chicken was better in terms of its juiciness, tenderness and flavour development.

The cleome gynandra (*nyevhe*) test results showed that the colour, taste and texture were ranked higher for the cleome gynandra dried after cooking, while the flavour was higher for that dried without cooking. The results indicated that the two methods of drying give products different quality factors. The experiment tested the hypothesis, *indigenous methods of drying vegetables affect the quality of cuisines produced*. The tested results found the hypothesis true.

The pumpkin leaves (*boora*) tests aimed to test the hypothesis that: *using indigenous equipment and fuel and ingredients affect the quality factors of dried vegetables*. The statistically significant tests rejected the null hypothesis for all the attributes, colour, taste and texture, showing higher intensity for the pumpkin leaves cooked in a clay pot, on fire and in peanut butter than the pumpkin leaves cooked in an enamel pot, on the stove and in cooking oil. This indicated that the cooking conditions gave different effects on the colour, taste and texture, therefore affecting the quality of the product.

The evaluation of creamed pumpkin samples had results which indicated that the use of peanut butter and seed butter in creamed pumpkins gives the appearance that is not significantly different with regards to the attributes: appetising, colourful, dull and glossy. The transparency was statistically significantly different and it was the only attribute affected statistically significantly by using the two types of butters. The hypothesis, *the use of different butter types affects the quality of indigenous cuisines*, answered as true as the attributes were different.

The last experiment results showed that the colour, flavour and taste of the okra cooked using bicarbonate of soda, wood sodium bicarbonate and maize cob sodium bicarbonate were statistically significantly different. The colour and flavour of maize cob having the highest strength, while the bicarbonate of soda had the highest taste strength. These results were an indication that the indigenous sodas give varied effects on the quality of the cuisine where they are used, which answers the hypothesis: *The use of different sodium bicarbonate types affects the strength of organoleptic factors of indigenous cuisines*.

These results led to the formulation of hypothesis for ten sensory evaluation tests which were done to validate the claims and satisfy the fourth objective of the study.

6.13 Conclusion

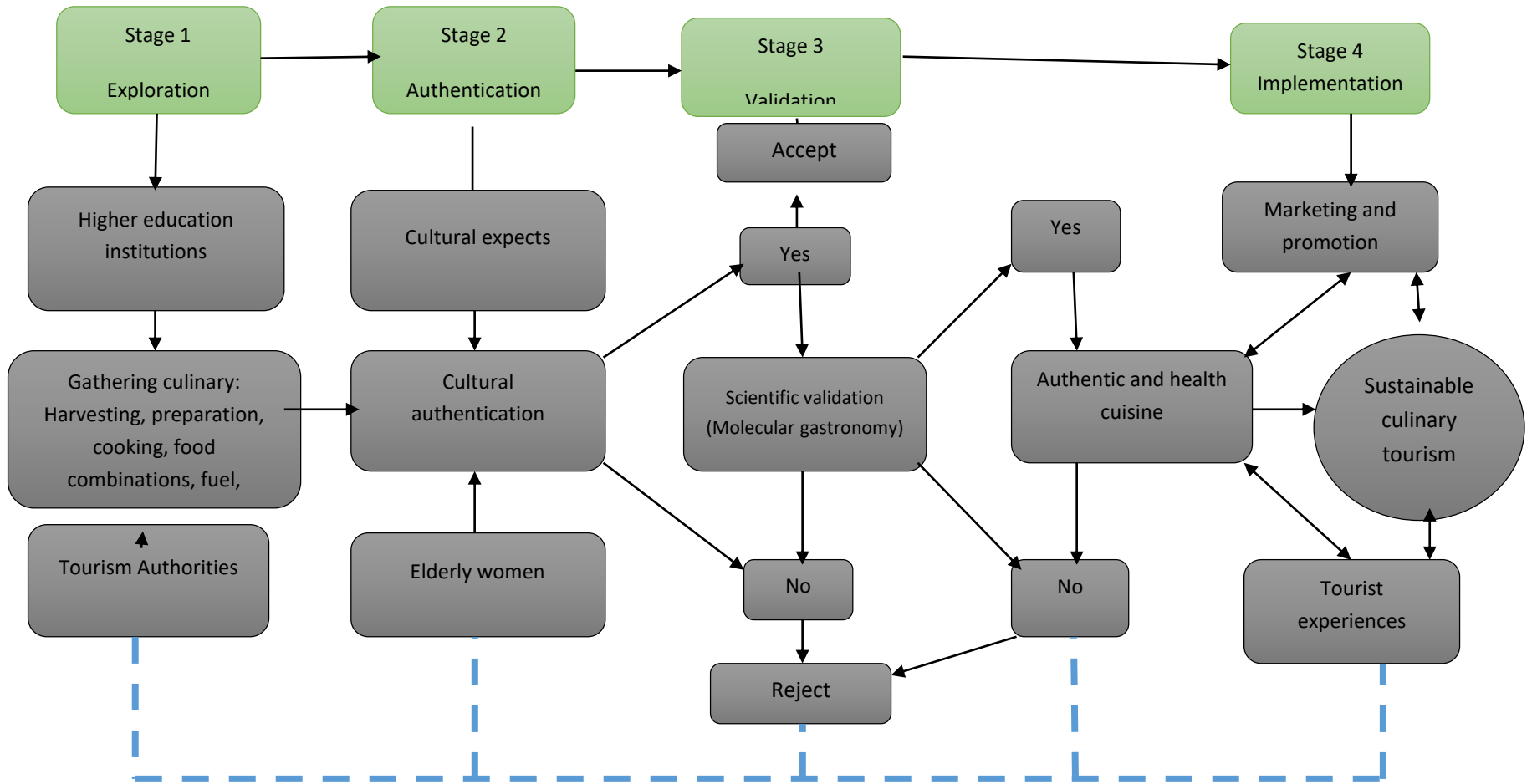
The chapter presented and discussed the results on the assaying of indigenous culinary claims. Sensory evaluations tests results revealed differences on the organoleptic and quality factors of the products produced. The results were specific on the quality factors which were unique with as a result of the preparation of specific ingredients as well as the method of preparing the cuisines. Quality of cuisine was generally better with products prepared and cooked using the indigenous methods and procedures according to the indigenous people. The indigenous culinary claims were valid, according to these results and can help to bring authenticity and uniqueness to the Zimbabwe cuisine. It is therefore worth coming up with a model on culinary tourism using these culinary claims and science behind cooking molecular gastronomy, thus closing the gap in knowledge indicated in this study. The next chapter will present the model for culinary tourism developed from these results.

CHAPTER 7

PROPOSED MODEL FOR THE DEVELOPMENT OF CULINARY TOURISM

7.1 Introduction

The main purpose of this thesis research was to assess the validity of indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism. This chapter therefore presents the proposed model for the development of culinary tourism. The model was developed mainly from the findings of indigenous culinary claims and molecular gastronomy which was synchronised with literature reviewed. Indigenous culinary claims in Zimbabwe were first explored, then validation was conducted through molecular gastronomy. According to this study, indigenous culinary claims are the basis for a quality culinary tourism product, since these lay the foundation for the food and culture of a destination. Through these culinary claims from the indigenous elderly, the specifications and secrets of a cuisine's authenticity and uniqueness are illuminated. Molecular gastronomy comes in to satisfy the Flavour theory, as supported by The Flavour Network (2016), which guides the quality of the cuisines produced through validation, followed by documentation. The stakeholders and consumers (tourist) are included as the service providers and consumers of the product. Therefore, the title of the model was: "The culinary culinary tourism model for Zimbabwe." Figure 7.1, shows the proposed model, which is further explained to show how the various aspects are linked to each other for a quality tourism product which develops the culinary tourism of Zimbabwe, and other developing countries who may find it applicable.



Intervening variables (Political, Economy, Social, Technology, Environment and Legal factors)

Fig 7.1: Proposed Model for culinary tourism in Zimbabwe (Culinary tourism model for Zimbabwe)

7.2 Model stages

7.2.1 Stage 1: Exploration of Indigenous culinary claims

Local cuisine makes the basis for the culinary tourism of a destination, thus, in the proposed model, indigenous culinary claims are taken as the first port of call for cuisine development. There is need to be collecting indigenous culinary claims continuously. This is important to prevent indigenous cuisines and methods from extinction. Furthermore, the process of validation can only be done when the claims are availed. The study found that there are many claims attached to local food and cuisines. For the purpose of the model some were consolidated to come up with eight claims focus areas or items, which spell out the culinary claims, thus usefull in the model. Harvesting, preparation, processing, cooking procedures, ingredient combination, equipment, fuel, time and temperature control, serving are the major claims to be used in this model, for cuisine and other culinary product, The processes ensure foods that are safe as they try to ensure all foreign materials are removed. Harvesting was always considered a significant aspect of cuisine development, therefore taken as one of the important culinary claims, as it contributed to the quality of the cuisine. The claims were that the success of a cuisine preparation process was determined by the correct harvesting methods used.

Food processing was highlighted as very important, and many claims were explained. Foods were frequently preserved for future use, hence processing was found important for this model as the method helped in availing food throughout the year. Another point was that the different processing methods of food ingredients created a diversity of foods products. That is food in fresh form and in dried form, while different drying methods were also used. That resulted in introduction of variety of tastes, flavours, colour, and textures in cuisines. Cleome gynandra (*nyeve*) was one of those vegetables which were dried using different methods. The sensory evaluation tests revealed that the cleome gynandra (*nyeve*) dried without boiling had a higher flavour intensity, while the one dried after boiling had a higher colour, taste and texture intensity. Variety in cuisine provision is important to tourists who visit the country and this study's findings were that variety was a missing aspect in Zimbabwe's indigenous cuisines, according to tourists' responses. The processing of small grain meal had various methods which gave different qualities, as revealed by the tests. Using soaked meal ingrediets give improved appearace, taste and a stronger flavour as was the pearl millet porridge and the finger mllet sadza. The importance attached to the processing of the food included specialisation of specific processes to make sure that the product comes out as expected. Communities'

cooperation was integral through the processing of food. Therefore, the model calls for the tourism industry to make use of the skills of the elderly women for product quality, through engagement for supply of correctly processed foods for use in cuisines. Food processing at community and household level includes: drying, threshing, winnowing, roasting, pounding, grinding, soaking, of cereals, vegetable and fruits. Food preparation methods were highly linked to the qualities of the product and the specific organoleptic factors to be obtained.

Food preparation according to this study, and model, refers to the preparation done before cooking. This preparation includes aspects such as: swotting, washing, breaking, and cutting. Using such method will cater for the different tastes of individuals. Slicing vegetables was considered a technique and part of kitchen stories that determined food quality attributes. The sizes and shape of slices was believed to influence perception of those who consume the vegetables. The preparation of food before slicing ensures cooked food attains good appearance and texture. The model includes the claims of preparation of food before cooking in order to come up with authentic products with indigenous tastes.

The model includes the claims which include: cooking methods, stirring techniques, mixing, time of adding ingredients, consistencies and degree of doneness. Other aspects of the cooking methods can be equipment, fuel type and time and temperature control, as they are part and parcel of the whole cooking process. All these factors assist in the cooking process and determine the quality of cuisine product. The sensory test results supported these claims, with the sensory tests results showing that the free-range chicken cooked in an iron-pot on fire had a higher intensity strength of juiciness, tenderness and flavour than that cooked in an enamel saucepan on an electric stove. Most of the cooking used firewood as the heating source, though some types of wood were not recommended for use, as there were claims of spoiling the flavour of food. These stories can however be linked to other cultural considerations such as conserving some fruit trees or those which were inhabited by some edible worms. The use of specific use of equipment could be associated with the requirement to retain heat and enhancing flavours that are unique to African customs and acquired tastes.

Ingredients were used and added at specific times, but there was need to know how and when to add. For example in the preparation of a vegetable recipe spiced with peanut butter, the procedure involves either making the peanut butter separately or adding directly to the food. Which points to the need to add ingredients at a specific time in order to attain flavour, appeal, taste and texture. Time and temperature control is an important aspect of the cooking process. Certain foods require high heat, fast cooking, while

others slow low heat cooking. This was where the indigenous claims emphasised use of certain types of implements or utensil or firewood. Consistencies were important for edibility and palatability of the food, and when food was special for babies, the elderly, sick and expectant mothers. The model advocates for cooking processes to adhere to the claims seriously for the culinary tourism to be developed in the destination.

Cooking ingredient combinations have been included in the model. Unique products can be produced from indigenous methods and knowledge of ingredient combination. Indigenous people had their own industry which produced some products. Foods were mixed to come up with a variety of products, which is now known as product diversification. Tourists can choose from that variety, where a type of food is consumed in various forms. Foods were combined to ensure enrichment, for use in special diets for baby weaning foods, expectant mothers, the elderly and the sick. The mixed meal porridge which was prepared from these foods; peanut, cow peas and pearl millet had a mild taste which is a suitable food for babies. The sensory tests results indicated a mild flavour, recommended for babies, while the three foods give a complementary value to amino acids to provide enough. Such practices should be upheld. They used the Flavour pairing theory according to (Mc Gee, 2013). because the flavour was well blended, thus the inclusion of the ingredient combination claims in the model.

The use of the proper tools, impliments and utensil for the processing, preparation and cooking was taken as important in the model. The indigenous equipment was made from the materials of qualities which were suitable for their uses, such that the process was well done. The winnowing baskets from reeds, allowed water to be drained from the food, when compared with the plastic ones on the market today. Food cooked well in clay pots, thus improving the juiciness, tenderness and flavour and these claybased pots facilitated heat retention. Modern restaurants and Chef's kitchens. Indigenous pots and equipment form the decor for the restaurants and other places where the food is served. The study results indicated lack of use of indigenous implements and tools, therefore the model included them to close the gap as they also play a major part.

The way food is served after cooking, forms part of the kitchen stories and has an important part in influencing food enjoyment. Even today serving of food is an important element, which include the serving equipment, temperatures in which the food is served, how the food is placed in the plate and overall presentation. The model advocates use of traditional equipment for serving the food, as that really illuminates the uniqueness of the cuisine. Equipment used give a certain appeal to food. However, some

say, it also gives a certain degree of stimulation of one's appetite. Food sharing was demonstrated by people eating from the same plate. Food serving temperatures were achieved by use of certain plate materials. Use of wooden plates retained heat better than metal plates.

Technical operations

Molecular gastronomy realises that cooking is a culinary activity which involves specific technical operations, which are critical for the technical success of a cuisine. It was molecular gastronomy movement which initiated for the exploration of these indigenous culinary claims. When recipes were explored, the technical aspects such as slices of oranges, were included. Therefore, in this study the indigenous cuisine preparation methods had such activities (recipe definition). An example is when pumpkin leaves were not cut, but broken by twisting. Also, the 'culinary precisions' which are other technical additional aspects, such as having to cook until a syrup forms.

Artistic component

Artistic component involves the correct choice of ingredients which can be used together in a cuisine. The artistic component can be studied scientifically as it also involves the use of senses (Mcgee, 2016). These should bring out all the organoleptic quality factors expected. A wrong choice of a single food item spoils the whole cuisine. This skill is important in cuisine development. An example is the mixed meal which was prepared from peanut, cow peas and pearl millet powders produced a well flavoured and a good colour of a meal suitable. When correct quantities are used quality is achieved. The sensory evaluation results For every product produced the overall taste and flavour of a cuisine is achieved. Serving and presentation of food also requires the artistic component for the food to have the eye appeal and appetite stimulation. This satisfies the saying "we eat with our eyes".

Social Aspect

The third aspect is the social aspect, which is important for the appreciation of food. The model advocated for all the aspects to be looked at holistically. The first aspects of culinary claims exploration found that food had social and cultural meaning that it signifies, thus in culinary tourism tourists are exposed to cuisine for socialisation. Culinary activities are also a way of meeting and mixing people of various cultures, sharing and learning. Traditional beliefs are also part of the social aspect of the culinary activity. For instance, salt should be added to water before adding vegetables. Indigenous culinary claims possess, all

those and there is need to keep on looking and relooking into them through the science of molecular gastronomy. The study findings also showed evidence of scientific method use in sensory evaluation tests done to determine whether claims are true or untrue. Including science in indigenous cuisines also gives them another image, which can motivate more consumers to like them, thus the model proposes use molecular gastronomy. The model is suggesting that the higher education sector would collect the claims as part of the researches. When of their researches, while the tourism bodies like ZTA, assist by giving support and authority, because their organization is responsible for promotion of tourism in Zimbabwe.

7.2.2 Stage 2: Authentication of indigenous culinary claims

The second stage is the authentication stage. The cultural aspects come in with their knowledge to provide the expertise for ingredient as well as energy among other important knowledge. The indigenous elderly who were the interviewees for this study provided valuable knowledge as the custodians of the food culture, so they should be part and parcel of authentication process. They can provide expert knowledge in hotels and restaurants as found in the study. Communities also benefit by improving their livelihoods, when they provide foods which they produce.

7.2.3 Stage 3: Validation of indigenous culinary claims

The third stage is the validation stage, Cuisines are then taken for scientific tests. This would be done within the restaurants. The organizations should have proper laboratories and food scientists who always validate cuisines, as the process should be continuous. Validated claims will be either valid or not, then they can be treated accordingly. Specific menus can be designed which suit the visitor who visits the destination.

The model shows linkages in the culinary claims to molecular gastronomy. The model proposed the validation of collected indigenous culinary claims, molecular gastronomy then comes in to explore processes occurring during culinary transformations (Burke, 2016). Science and art have to meet in the kitchen for product development, as such the proposed model is in-sync with current trends in cuisine development. Based on ideas from proponents of molecular gastronomy (Burke, This, Kurt and Kelly), cooking is both an art and a science (Thomson, 2014). This model will go with the current trends in cuisine development. The latest culinary movements are calling for the chef to be in the laboratory. Three components of the culinary activities will guide the process of validation, which are; technical operations, artistic component and social aspect.

Health benefits associated with consumption of certain foods is an important factor to consider in the choice of food. The indigenous culinary claims did not spell the food and its effects on health. For that reason, organic foods were used and today are the trends, especially the reason why people are consuming the indigenous foods. Thus this model proposes use of claims made about the health properties of foods used by the indigenous people. Diseases were prevented and healed through the indigenous diet. Through use of whole foods, less fats, sharing, use of food preservation methods and food synthesis to cater for the lost nutrients, people were healthy and lived longer. Practices of administering medicines through food should continue to be used, especially for the critically sick and children who may refuse to take the medication. Therefore, the health claim should be part of this model.

7.2.4 Stage 4: Implementation of the model.

When all is done, then comes the implementation stage. This involves all stakeholders, such as the government, ministries and the chefs. Marketing and promotion should be done, so that the product is known. Variety of cuisines and culinary tourism activities are provided for the tourists to experience the true Zimbabwe taste. Give model provides for more recipes to be formulated, while others are improved. The model also gives room for innovation, thus providing more unique varieties, though authentic. Quality products are then marketed and they even market themselves. The overall result is a sustainable culinary tourism. However, there are these intervening variables which may affect development at any stage, environmental issue, such as the COVID, which resulted in most people not visiting places. Technology also comes in, to assist and it can also contribute to loss of authenticity. The political issues come in with controls for the benefit of the programme, while others may prevent growth.

7.3 Culinary tourism product

The process of validation is meant for recipe perfection, from which a variety of products can be produced. Cuisines authentic in flavour, taste, colour, texture should be the result from the validation process. These cuisines will be unique to Zimbabwe and regional cuisines should result from this approach. The validated work can then be documented and used in the production of more authentic cuisines, which can be packaged. Information shared during culinary tourism platforms can provide more information to make the cuisine known. More activities can be planned which also expose the industry personnel and the community so that they share ideas, while improving their knowledge and skill.

7.4 Industry

The food service industry plays an integral role in culinary tourism. In particular, they produce and provide the cuisines. The model includes them, as they should be in the forefront in coordination with the institutions of learning who do research, explore claims, validate them and do the tests. They are also involved in culinary tourism activities, where they market their products, learn more through competitions, among other activities. Therefore universities became part of this model, as they also provide expertise and facilities for laboratory work, while the industries should be geared to set up their own.

7.5 Chapter Summary

The chapter was focused on the proposed model for the development of culinary tourism in Zimbabwe, which fulfilled the final objective of the study. The model, which was named “The culinary tourism model,” if well implemented should help in preserving Zimbabwe’s indigenous cuisine and those of other destinations. Implementation of the model should start from the policy makers that is the government together with the tourism ministry and bodies such as The Hospitality Association of Zimbabwe, Zimbabwe Tourism Authority and the Chef’s Association of Zimbabwe and the hospitality industry. In summary the model advocates for the culinary claims to be collected time after time, go through the process of validation and that can help in recipe perfection. Furthermore, the quality of the culinary product would be improved when there is coordination between the indigenous knowledge and science. Cuisines will be produced with an informed decision. The next chapter will summarise the study by giving conclusions, implications and recommendations.

CHAPTER 8

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

8.1 Introduction

The main purpose of this research was to assess the validity of indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism. The previous chapters 4, 5, 6 and 7 provided the findings from the data collected to satisfy the following specific objectives: to establish the nature of culinary tourism in Zimbabwe (chapter 4), to assess the extent to which indigenous cuisines are being consumed by tourists (chapter 4), to explore the available indigenous culinary claims (chapter 5), to conduct an assay of Zimbabwe's indigenous culinary claims through molecular gastronomy (chapter 6) and to develop a model for culinary tourism in Zimbabwe from the indigenous culinary claims and molecular gastronomy (chapter 7). Chapter 8 was the last chapter of the thesis and its purpose was to provide the study conclusions, and their implications to policy, practice and research methodology. Finally, some recommendations are provided.

8.2. The study conclusions were presented according to the objectives. First the conclusions on the nature of culinary tourism in Zimbabwe, the extent too which indigenous cuisines are consumed by tourists, the indigenous culinary claims and the assaying of indigenous culinary claims. Lastly the conclusion on the model developed.

8.2.1 Conclusions on the nature of culinary tourism in Zimbabwe.

From the demography of tourists, it can be concluded that Zimbabwe was visited by tourists of all ages during the study period, though the middle-aged were dominant, the educated and professionals, who value the importance of a holiday and have disposable income. The other point of note was that the destination was visited by tourists from almost all continents of the globe, visiting mainly for rest and relaxation, and business meetings. Culinary tourism was still in its infancy in Zimbabwe as indicated by how most domestic tourists. The gastronomy of the destination was not motivating tourists to choose Zimbabwe as a visit destination based on food cuisine considerations. The general quality of cuisine, in restaurants in Zimbabwe was average, though the taste and flavour was good. Local tourists' were concerned about the gradual loss

of Zimbabwe's indigenous cuisine authenticity. The study also revealed that Zimbabwe indigenous cuisine's authenticity was not known, due to lack of exposure. The hospitality industry justified the cuisine's authenticity from the use of local foods and indigenous cooking methods. The conclusion drawn from the industry was that the uniqueness was generally in using local foods and excluding convenient thickeners indigenous cooking methods and equipment and using fire to cook. The idea of employing elderly women in the preparation of indigenous cuisines was supported overwhelmingly, to improve authenticity and variety. Almost all food service organisations were offering indigenous cuisines in one way or another. The missing elements in the Zimbabwe indigenous cuisines were of cuisines provided by the restaurants and outlets, the service which should be traditional, the pricing which was astronomical and not competitive enough to attract takers, leading to the cuisine remaining relatively unknown. Tourists' preferred hand-on exposure in food preparation as they take opportunities to learn more about the host culture through these activities.

8.2.2 Conclusions on extent of indigenous cuisine consumption by tourists.

The tourists spent 30 to 39 % of their budget on food, though it was not specifically indigenous foods.. Local tourists indicated having consumed local cuisines during their visit, while the majority of the foreign tourists had not consumed any. The favoured foods popularly consumed were *mopani*, game, dried fish, maheu, dried vegetables, and free-range chicken among others. Sadza prepared from the popular figure millet, maize meal and rice with peanut butter were the popular starches consumed. Consumption of indigenous cuisines was mainly for prestige, health and social reasons. Few also took local food as a souvenir and most were the Zimbabweans living in the diaspora. The industry indicated potential for culinary tourism as there was an increasing demand of these foods by tourists. Opinions on the future prospects of the cuisine were bright, as more people are reverting to indigenous foods.

8.2.3. Conclusion on the indigenous culinary claims.

The indigenous culinary claims explored and results presented aimed to determine the specifications on the indigenous cuisines preparation and production as well as their consumption. The conclusions which were derived from the results was that first and foremost food was of great importance and had many uses .Food had meaning, signifying various cultures and used for some rituals and taboos and it was generally shared.

The foods available in the two study areas were generally the same, with few species of wild vegetables not available in the other areas or had different names.

The results on the indigenous culinary claims gave the conclusion that the claims of food preparation and cooking start from the processing of the food (ingredient) to the preparation before cooking process itself having most of the secretes, serving the consumption (harvest to plate or farm to table). The claims revealed specific and unique aspects of cuisine preparation throughout the process. Processing and preparation were indicated their importance because their quality determines that of the end product. Similarly the special preparation points were the claims for cuisine characteristics. Specific claims were attached to different grains, vegetables, tubers and roots, meats, edible insects, butters, thickening and seasoning. These resulted in the uniqueness of a particular cuisine produced. Though the specific claims were attached to specific foods and cuisines, the major claims for all cuisine types were centered on the processing the food to the ingredient, preparation before cooking, ingredient combination, use of ingredients in the cuisine, when and how the ingredient was added during the cooking (cooking methods), cooking and serving equipment type, fuel and time and temperature control, consistencies, serving combinations. Cooking food until well done was an important claim for all indigenous foods. Time and temperature control and correct ingredient proportion and use of correct equipment were key factors to achieve a well done cuisine. Specific consistencies were purpose driven, like for special diets. Consistencies affected the appearance of the cuisine and the satiety value mainly, thus thicker sadza for those doing manual work and a thin porridge for a baby or the sick.

8.2.4 Conclusion on the assay of indigenous culinary claims.

The assaying of indigenous culinary claims was done to fulfil nine hypotheses, which covered seven claims presented in chapter seven. The validation was on assessing the effects on organoleptic factors of some culinary conditions. Most of the factors were affected significantly, while few were not significantly affected by the conditions or claim procedure or process. The effect sizes also varied from small, medium to large. On the processing of small grains it was concluded that organoleptic factors of cuisines' appearance, taste, texture and aroma were better than when meal was not processed using the indigenous methods. Soaking grains during processing produces a stronger flavours and taste cuisine. Other conclusions were that the methods of combining indigenous ingredients improved the quality of the cuisines. The dried beef in peanut butter and oil test gave the conclusion that dried beef's flavour, taste and texture intensity can be improved by using peanut butter than cooking oil, while cooking in an iron pot of

fire also gives higher intensity of juiciness, tenderness and flavour of free-range chicken. Another point of conclusion was that cooking at low temperatures for a long time was important for the development of juiciness, tenderness and flavour in the cooking of the dried meat. Therefore, the indigenous methods of choosing cooking ingredients for vegetables affect the quality of cuisines produced. The conclusion drawn from the use of different sodium bicarbonate types was that they were all able to achieve the effect of breaking down, at the same time giving variety in the okra dishes. Therefore, the use of different types of sodas affecting the strength of organoleptic factors of indigenous cuisine. From the findings it can be concluded that most of the indigenous culinary claims were true.

8.2.5 Conclusion on the proposed model developed.

The model proposed should inform the food service industry about the vital part played by the indigenous culinary claims and molecular gastronomy in coming up with authentic, unique and a wide variety of cuisines. The model demonstrates that authentic and unique cuisines provide the platform for various activities for tourists to experience the culinary tradition of the destination. They also provide learning and continued exposure to the industry personnel for improvement. The government and other stakeholders should do their part in improving the culinary tourism product, which attracts tourist and thus a developed culinary tourism for the destination, Zimbabwe.

8.2.6 Conclusion on the main objectives

The main objective of the study was: to assess the validity of indigenous culinary claims through molecular gastronomy for the development of culinary tourism in Zimbabwe. The nine sensory evaluation tests done covered nine claims to cover the null hypotheses which stated that: The indigenous preparation methods improved the quality of cuisines. Finger millet sadza, sorghum meal porridge, mixed meal porridge, dried beef stew, free-range chicken stew, cleome grayndra (*nyevhe*), pumpkin leaves (*boora*), creamed pumpkin (*nhopi*), and okra were used to assess the validity of claims with regards to small grain processing (*removal of all chaff and roasting the grain*), soaking grain, combining food to make an ingredients, ingredient choice (cooking oil and peanut butter in), indigenous equipment (iron pots/ clay pots), fuel types (wood fire), using different butter types (peanut and seed butter) and using indigenous sodium bicarbonate types. (maize cob, wood type and bicarbonate of soda. Based on the gathered results from the sensory evaluators, the null hypotheses were rejected in most of the quality or organoleptic factors evaluated. These results indicated

differences on the two or three samples. The results for the indigenous claimed samples were generally better in quality, showing scientifically strong significant effects ($p\text{-value}\leq 0.05$) on appearance, taste, flavour, colour, texture ($p\text{-value} = 0.002$). The Wilcoxon results had Z-values below 1.96, showing stronger intensity of juiciness, tenderness and flavour. For most tests the effect sizes ranged from medium to large. While indigenous people expressed the qualities of cuisines using general terms, the validation process indicated the particular aspect that was affected and thus improved by the process or procedure. The conclusion that was drawn from the study's main objective was that indigenous culinary claims were valid. This study's results on the sensory evaluation also showed why some dishes were popular. Based on the conclusion that the indigenous culinary claims were valid, the recipes used for the cuisines as supported by the indigenous culinary claims, thus molecular gastronomy can be considered as part of a recognised authentic dishes. Such recipes like the Cleome gynadra, dried beef in peanut butter sauce, creamed pumpkins in seed butter, mixed meal porridge and okra cooked using maize cob sodium bicarbonate among others. The next step in recognising these dishes involves taking it to the industry and consumers for further tests.

8.3. Implications of the findings

8.3.1 Policy

Since policy assists in implementing aspects of development, the results on indigenous culinary claims and their validation, should inform policy implementation in the tourism and hospitality industry. Policy will assist in giving the indigenous cuisines the value they deserve, by specifying that all recipes should be validated before they are used for cuisine authenticity. The hospitality industry should take it upon themselves using the relevant bodies like The Hospitality association of Zimbabwe (HAZ) and Zimbabwe Tourism Authority (ZTA). Policy issues can include things like food and menu labeling, which should only be done after a cuisine is validated to avail the relevant information. Menu labeling becomes part of the documentation process.

8.3.2 Practice

The study results revealed that indigenous people have the product that culinary tourism wants for its development. The recipes which were just used without being validated, should be validated first. The

hotels should have laboratories which are managed by food science practitioners who will be assisting in the tests. Recipes should be tested and retested for consistency in authenticity. Variety of cuisines will be the result of recipe validation. The indigenous methods and validation will result in a variety of cuisines, since variety was one of the missing aspects in the cuisines provided by the industry. Indigenous knowledge on indigenous cuisine is authentic and valid. The study proposed a model to be used to develop culinary tourism in Zimbabwe using indigenous culinary claims and molecular gastronomy. Using the model which includes all stakeholders in the industry and academic will be a step towards the study fulfilling the requirements of Education 5.0. Education 5.0, which advocated for taking the research results to the industry, calls for using new products, which may be result when the model is implemented in the last stage.

8.3.3 Theory

The model developed in this thesis will be a useful to develop cuisines in the destination, Zimbabwe and other destinations who may see the model applicable. The model demonstrates the application of the flavor theory, which was the overarching theory for the study. The theory was applied in the study to determine the quality (organoleptic) factors of cuisines by sensory evaluation tests. The use of the model assists to quality evaluation of cuisines and even coming up with more authentic cuisines. The use of the indigenous culinary claims and molecular gastronomy in the model calls for the application of the theory.

8.3.4 Methodological

These results build on existing body of knowledge on the destination trying to boost culinary tourism. The model proposed by this study is the first one which uses indigenous culinary claims as a basis for indigenous cuisine development. Molecular gastronomy was also made part of the model, which is also a new science in cuisine development, especially in developing countries. The study used a multidisciplinary approach which has not been done much in tourism studies, therefore giving this study its uniqueness. Further studies on this topic should continue because the collected indigenous claims were not all validated. The other provinces and districts of Zimbabwe should have their indigenous culinary claims explored to enable validation. The validation of indigenous culinary claims could also be done using the qualitative methodology, since this study used quantitative validation methodology. The nutritive value of the cuisines is an important aspect that should be validated, since there were numerous health claims of the indigenous cuisines and foods.

8.4 Recommendations

The study recommends surveys be conducted to understand the needs of tourists, so that cuisine can be tailored to meet tourists' needs. The Zimbabwe cuisine tourism products and services require extensive marketing for culinary tourism to be known regionally and globally. The results on the nature of culinary tourism showed that the Zimbabwe indigenous cuisines are not known. Promotion can be done through activities like: cooking competitions, food demonstrations by renowned chefs and the indigenous women and food expos. Documentation will also assist in making the cuisine known and prevent the indigenous cuisine from extinction. When the quality of cuisine is improved through the proposed model process, branding and packaging will assist it giving the cuisine exposure.

An important area of concern from the study was the high pricing of cuisines in Zimbabwe. Recommendations are that there is every need to find strategies which can make the prices affordable and competitive. Producing more foods to be used as ingredients can relieve the service providers of that challenge. This should involve the government and other line ministries like Ministry of Agriculture to support with resources (financial and land) to enable the production of the foods. Variety can be enhanced by coming up with regional cuisines. This is possible through collecting claims in all regions of Zimbabwe. Regional cuisines should be produced through regional competitions, as is the case in Zimbabwe since 2019 through the initiation of First Lady Amai Auxilia Mnangagwa. For the sake of continued validation, research should be part of the policy, that food services should have their own laboratories, while coordinating activities with the higher institutions of learning. As the study results indicated lack of knowledge of new trends in cuisine development like molecular gastronomy, molecular cuisine, chefs should be exposed to more training, so that they are acquainted with the new trends.

8.5 Conclusion

The chapter concluded the study, giving the conclusions which were drawn from the study, implications and recommendations. The study concluded that indigenous culinary claims were valid, hence they can be used as the basis for cuisine development. Therefore, the model was proposed which is named "Indigenous culinary claims and molecular gastronomy model for culinary tourism development."

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APPENDICES

Appendix 1. Pictures of indigenous equipment: Varied clay pots for cooking, storage and serving plates.





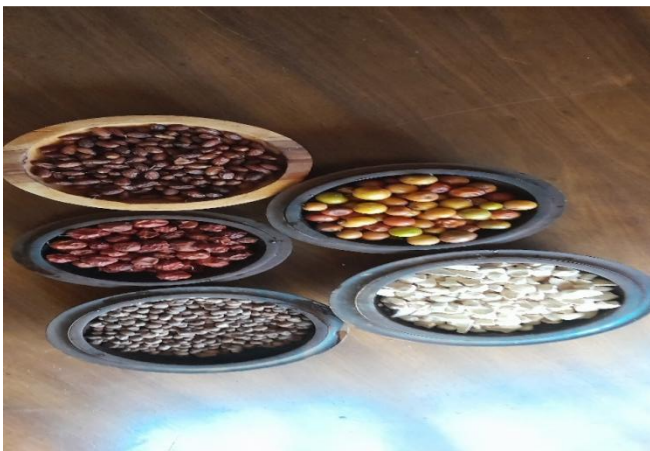
Soldier termites



Mopani worms



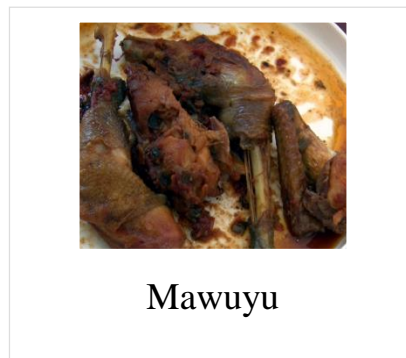
Mukoyo on the left Tsenza on the right



Wild fruits> masau nyii and mawuyu in white colour.



APPENDICE 2 TRADITIONAL CUISINE PREPARED BY TRADITIONAL METHODS



Appendix 2: Consent form for tourists and industry respondents

CHINHOYI UNIVERSITY OF TECHNOLOGY



SCHOOL OF HOSPITALITY AND TOURISM

DEPARTMENT OF HOSPITALITY AND TOURISM

CONSENT FORM

I want to thank you for taking your time with me today. My name is Margaret Nyarota., a DPhil student at Chinhoyi University of Technology. My DPhil topic is: “**Indigenous culinary claims and molecular gastronomy: Developing a model for culinary tourism in Zimbabwe**”. I would like to talk to you about your experience about culinary tourism in Zimbabwe. The data is going to be used to assess the nature of culinary tourism in Zimbabwe and the extent to which indigenous cuisines are being consumed by tourist.

The filling in of the questionnaire will take about 30 minutes. I would be very much appreciating if you answer all questions carefully. All responses will be kept confidential. This means that your questionnaire responses will only be shared with the research team members and will ensure that any information we include does not identify you as the respondent.

Are there any questions about what I have explained?

Date:

Signature:

APPENDIX 3: Questionnaire for tourists

My name is Margaret Nyarota, a DPhil student at Chinhoyi University of Technology and I am undertaking a survey on the nature of culinary tourism in Zimbabwe. My DPhil study seeks to assess the validity of indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism in Zimbabwe.

Indicate your response by ticking in the box and filling in the spaces provided.

SECTION A: BIO-DEMOGRAPHIC DATA

1. Gender: Male Female

2. Indicate your age group

18-25 years	26-35 years	36-45 years	46-55 years	56-65 years	Over 60 years
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. What is your highest educational qualification?

Primary	Secondary	Advanced level	Diploma level	Degree level	Masters level	Doctorate Level
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. What is your employment category?

Education	Commercial	Health	Engineering	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. What is your country of origin?

Africa	America	Europe	Asia	

6. What is your occupation?

Employee	Self-employed	Student	Housewife	Unemployed	Retired

7 a). What is your purpose of visit?

Rest and relaxation	Business	Visiting friends and relatives	Others

b). Others? Specify.

.....

SECTION B: NATURE OF CULINARY TOURIS IN ZIMBABWE

8. What is your understanding of culinary tourism?

.....

9. Has the Zimbabwe gastronomy been a motivation for choosing the destination?

Yes

No

10. How would you assess the different aspects of gastronomy in Zimbabwe?

Gastronomy aspect	Excellent	Very good	Good	Fair	Poor
Traditional cuisine					
Service and hospitality					
Atmosphere in the restaurant					
Quality of cuisine					
Variety of dishes					
Prices					
Facilities					

11 a). What is your choice of eating place when you visit Zimbabwe?

Hotel restaurants	Independent restaurant	Fast food outlet	Village food outlet

b). What are your reasons for the choice of eating place?

.....

12. What is your opinion on the authenticity of the Zimbabwe indigenous cuisine?

.....

13. How well would you say your dietary needs (e. g: low fat, vegetarian, low sugar) are catered for by the Zimbabwe indigenous cuisine?

Very well	Quite well	Not very well	Not at all well	No opinion

14. Would you say the Zimbabwe indigenous cuisine gives you a memorable experience?

Yes

No

b) If yes, why?

.....

.....

.....

15. Which food related activities to you like to visit? Tick your choices from the list.

Food related activity	Choices
Displaying of typical Zimbabwe delicacies	
Cooking competitions	
Wine exhibitions	
Tea gardens	
Rural farm tours	
Cuisine tasting sessions	
Food and art decoration	
Renown chefs preparing signature dishes	

b). Any other? Specify.

.....
.....

c). What are your reasons for the choices of food related activities to visit?

.....
.....
.....
.....

16. a). Rank the characteristics of the indigenous cuisine in Zimbabwe hotels and food outlets

Cuisine characteristics	Very poor	Poor	Good	Very good	Excellent
Quality of food is excellent					
The food is tasty and rich in flavour					
The service is excellent					
The food meets the price value					

17. What do you say is missing in the Zimbabwe's cuisine?

.....
.....
.....

18. What is your opinion on the Zimbabwe cuisine's contribution to culinary tourism?

.....
.....

.....
.....
19. What could be the challenges for the Zimbabwe indigenous cuisine's contribution to culinary tourism?

.....
.....
.....
.....

20. What do you think can be done to make Zimbabwe a culinary tourism destination?

.....
.....
.....
.....

SECTION C; EXTENT OF INDIGENOUS CUISINE ONSUMPTION BY TOURISTS.

21. What fraction of your budget do you spend on food?

.....

22 a).Have you eaten any local food since you arrived in Zimbabwe?

Yes

No

b) If yes, which ones?

.....
.....

.....
.....
23. What are your favourite local foods/cuisines when you visit Zimbabwe?

.....
.....
.....
.....

24 a). Have you consumed any edible insects, e. g. Mopani worms?

Yes

No

b). If yes, how was the taste?

.....
.....
.....

25. What would you say is your reason for choosing the Zimbabwe indigenous cuisine? Choose from the list.

Physiological	Social	Esteem	Convenience	Health	Others

b) Others: Specify

.....
.....

26 a). Have you ever taken away the Zimbabwe local food as a souvenir?

Yes

No

b). If yes, which foods did you take with you?

.....
.....

27. Indicate the extent to which you agree to the reasons for indigenous cuisine experience.

	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
Exciting experience					
Health reasons					
Learning/knowledge					
Authentic experience					
Togetherness					
Prestige					

28. Did our cuisine meet your expectations?

Yes

No

Thank you for your participation.

Appendix 4: Questionnaire for hoteliers

My name is Margaret Nyarota, a DPhil student at Chinhoyi University of Technology and I am undertaking a survey on the nature of culinary tourism in Zimbabwe. My DPhil study seeks to assess the validity of indigenous culinary claims through molecular gastronomy for the development of a model for culinary tourism in Zimbabwe.

Indicate your response by ticking in the box and filling in the spaces provided.

SECTION: A Bio-demographic data

1. What is your job title?

.....

SECTION B: NATURE OF CULINARY TOURISM IN ZIMBABWE.

2. What is your understanding of culinary tourism?

.....
.....
.....
.....

3. What range of cuisine does your establishment offer?

Chinese	Portuguese	Italian	Others

4. a) Does your organization offer Zimbabwe's indigenous cuisine?

Yes

No

b) If yes, which cuisines do you offer?

.....
.....
.....
.....
.....

5. a) How often are these offered?

Daily	Once a week	Once a month	Only on special days	Occasionally

b) What are the reasons for the frequency?

.....
.....
.....

6. a) Do you offer edible insects as part of your indigenous cuisines?

Yes

No

b) If yes, how often?

Daily	Once a week	Once a month	Only on special days	Occasionally

c) Which cuisines do you offer?

.....
.....
.....

7. What is your opinion on the authenticity of the indigenous cuisines you are offering?

.....
.....
.....
.....
.....

8. How unique is your cuisine?

.....
.....
.....
.....
.....

9. What is your view about hiring or employing the elderly women in the preparation of indigenous cuisines?

.....
.....
.....
.....

10.a) Have you been involved in indigenous cuisine promotions such as the chef’s competitions, food demonstrations by the chefs, cooking classes, sampling of Zimbabwe delicacies, outdoor cooking, etc.?

Yes

No

b). If yes, how did the exposure improve your skills?

.....
.....
.....
.....

11. Has your organisation embraced the new trends in cuisine development such as: molecular gastronomy, molecular cuisine, modernistic cuisine, or slow food cooking?

Yes

No

12. What is your organization doing to promote culinary tourism in Zimbabwe?

.....
.....
.....
.....

13 a). What is your view regarding the contribution of culinary tourism to promotion of tourism in Zimbabwe?

.....
.....
.....
.....

b). Give reasons for your answer.

.....
.....
.....
.....

14. What do you think can be done to improve culinary tourism using indigenous cuisines?

.....
.....

.....
.....

SECTION C: EXTENT OF INDIGENOUS CUISINE CONSUMPTION BY TOURISTS.

15. What has been the extent of demand for indigenous cuisines by tourists?

Very high	High	Mediocre	Low	Very low

16 a). Which group of customers has a high demand for indigenous cuisines?

Domestic tourists	Foreign tourists	Both

b) What do you think are the reason for that higher demand?

.....
.....
.....
.....

c) What do you think are the reasons for the low demand?

.....
.....
.....
.....

17. Which dishes are more popular?

.....
.....
.....
.....

18. What is your opinion on the future of indigenous cuisine consumption buy tourists?

.....
.....
.....
.....

Thank you for your participation.

CHINHOYI UNIVERSITY OF TECHNOLOGY



SCHOOL OF HOSPITALITY AND TOURISM

DEPARTMENT OF HOSPITALITY AND TOURISM

CONSENT FORM FOR THE ELDERLY WOMEN

I want to thank you for taking your time with me today. My name is Margaret Nyarota., a DPhil student at Chinhoyi University of Technology. My DPhil topic is: Indigenous culinary claims and molecular gastronomy: Developing a model for culinary tourism in Zimbabwe. I would like to talk to you about your experience in the indigenous ways and methods used to prepare and cook food in Zimbabwe. The data is going to be used to develop culinary tourism in Zimbabwe.

The interview would take about one hour. I am asking for your permission to be taping you during the session, so that I capture as much information as possible. I would very much appreciate if you answer all questions carefully.

All responses will be kept confidential. This means that your questionnaire responses will only be shared with the research team members and will ensure that any information we include does not identify you as the respondent. If you do not want to continue with the interview, you can end any time.

Are there any questions about what I have explained?

Are you willing to participate in answering this questionnaire?

Interviewee signature..... Date:

Appendix 6: Interview guide for the elderly women

Exploration of indigenous culinary claims

1. Can you tell me in brief the history of food and eating of this area?

Prob: How was the knowledge shared?

2. What is your understanding of indigenous food/dishes/cuisines?

3. What are the major indigenous foods of this locality?

4. What indigenous dishes/ cuisines are prepared from these foods?

5. Can you describe how these dishes are prepared using the authentic indigenous methods?

a) Starches/Carbohydrate dishes

b) Protein/ Meat dishes

c) Vegetables

d) Other dishes/Snacks/ beverages

6. Why are these specific processes followed?

7. How are the following used in the cooking process?

a) Quality of food of food.

b) Equipment

c) Fuel type.

d) Amount of heat/Temperature control.

e) Cooking time

f) Consistencies of food/sauces.

g) Nutritive value of food.

8. What are the rules or does and don'ts during the cooking processes which give the cuisines the expected quality?
9. What specific skills are of importance to come up with the authenticity of the specific dishes?
10. How are these dishes served?
11. Are were the left overs utilized?

Thank you for participating

SENSORY EVALUATION INSTRUMENTS

Appendix 7: Sensory evaluation test 1

Sensory evaluation test 1: Sensory assessment for figure millet (zviyo) sadza types

Evaluate the samples given and circle the word that best describes each attribute.

Sample 321

Attribute	Descriptive		Descriptive		Descriptive		Descriptive		Descriptive	
Appearance	Appetising		Dry		Greasy		Crumbly		Flat	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Taste/flavour	Tasty		Salty		Fatty/bland		Burnt		Undercooked	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Aroma	Rancid		Aromatic		Musty		Savoury		Mild	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Texture	Dry		Chewy		Soft		Hard		Grainy	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

Sample 421

Attribute	Descriptive		Descriptive		Descriptive		Descriptive		Descriptive	
Appearance	Appetising		Dry		Greasy		Crumbly		Flat	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Taste/flavour	Tasty		Salty		Fatty/bland		Burnt		Undercooked	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Aroma	Rancid		Aromatic		Musty		Savoury		Mild	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Texture	Dry		Chewy		Soft		Hard		Grainy	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

Appendix 8. Observation chart for rapoko sadza

Claim validation of the effects of the indigenous processing methods of grains on the cooking of sadza.

Cooking stage	Claims	Processed	Not processed
Blending	Different quantity of meal used. One uses more for same quantity of water.		
Boiling <i>(kukwata)</i>	Porridge appearance- colour, smoothness.		
Cooking	-Ease or difficult of cooking. -Consistency after adding the same quantity of meal.		
Texture	-Smoothness and dripping		
Any other observations			

Appendix 9: Sensory evaluation test 2: Sorghum meal porridge sensory evaluation

1. Evaluate the sample by ticking the word that best describes the appearance.

Descriptive	Appearance			
	Sample 1		Sample 2	
	Yes	No	Yes	No
Appetizing				
Greasy				
Crumbly				

2. Evaluate the strength of flavour and taste for the samples using the 5-point likert scale: extremely strong to absent.

	Ranking Scale	Flavour/Aroma		Taste	
		Sample 1	Sample 2	Sample 1	Sample 2
1	Extremely strong				
2	Very strong				
3	Moderate				
4	Slight				
5	Absent				

3. Evaluate the sample by ticking the word that best describes the texture.

Description	Texture

	Sample 1		Sample 2	
	Yes	No	Yes	No
Chewy				
Soft				
Oily/Greasy				
Grainy				

Appendix 10: Sensory evaluation Test 3: Mixed meal porridge sensory evaluation

1. Evaluate the sample by ticking the word that best describes the appearance.

Descriptive	Appearance	
	Yes	No
Appetizing		
Greasy		
Crumbly		

2. Evaluate the strength of flavour and taste for the samples using the 5-point likert scale: extremely strong to absent.

	Ranking Scale	Flavour/Aroma	Taste
1	Extremely strong		
2	Very strong		
3	Moderate		
4	Slight		
5	Absent		

3. Evaluate the sample by ticking the word that best describes the texture.

Description	Texture	
	Yes	No
Chewy		
Soft		

Oily/Greasy		
Grainy		

Appendix 11: Test 4: Sensory evaluation of dried beef cooked on the electric stove and on fire.

Evaluate the quality factors of the samples 303 and 404 using the hedonic scales 1 to 8 for juiciness, tenderness and flavour intensity.

Sample 303

	JUICINESS	Sample 303	TENDERNESS	Sample 303	FLAVOR INTENSITY	Sample 303
8	Extremely juicy		Extremely tender		Extremely intense	
7	Very juicy		Very tender		Very intense	
6	Moderately juicy		Moderately tender		Moderately intense	
5	Slightly juicy		Slightly tender		Slightly intense	
4	Slightly dry		Slightly tough		Slightly bland	
3	Moderately dry		Moderately tough		Moderately bland	
2	Very dry		Very tough		Very bland	
1	Extremely dry		Extremely tough		Extremely bland	

Sample 404

	JUICINESS	Sample 404	TENDERNESS	Sample 404	FLAVOR INTENSITY	Sample 404
8	Extremely juicy		Extremely tender		Extremely intense	
7	Very juicy		Very tender		Very intense	
6	Moderately juicy		Moderately tender		Moderately intense	

5	Slightly juicy		Slightly tender		Slightly intense	
4	Slightly dry		Slightly tough		Slightly bland	
3	Moderately dry		Moderately tough		Moderately bland	
2	Very dry		Very tough		Very bland	
1	Extremely dry		Extremely tough		Extremely bland	

Appendix 12: Sensory test 5: Sensory evaluation of chicken preparation in iron pot on fire and enamel on electric stove.

Evaluate the quality factors of the samples 550 and 660 using the hedonic scales 1 to 8 for juiciness, tenderness and flavour intensity.

Sample 550

	JUICINESS	Sample 550	TENDERNESS	Sample 550	FLAVOR INTENSITY	Sample 550
8	Extremely juicy		Extremely tender		Extremely intense	
7	Very juicy		Very tender		Very intense	
6	Moderately juicy		Moderately tender		Moderately intense	
5	Slightly juicy		Slightly tender		Slightly intense	
4	Slightly dry		Slightly tough		Slightly bland	
3	Moderately dry		Moderately tough		Moderately bland	
2	Very dry		Very tough		Very bland	
1	Extremely dry		Extremely tough		Extremely bland	

Sample 660

	JUICINESS	Sample 660	TENDERNESS	Sample 660	FLAVOR INTENSITY	Sample 660
8	Extremely juicy		Extremely tender		Extremely intense	

7	Very juicy		Very tender		Very intense	
6	Moderately juicy		Moderately tender		Moderately intense	
5	Slightly juicy		Slightly tender		Slightly intense	
4	Slightly dry		Slightly tough		Slightly bland	
3	Moderately dry		Moderately tough		Moderately bland	
2	Very dry		Very tough		Very bland	
1	Extremely dry		Extremely tough		Extremely bland	

Appendix 13: Sensory test 6: Vegetables dried using different methods: (Nyevhe)

1. Rate the intensity for the sensory attributes of **colour, flavour, taste and texture** for the samples 661 and 771

Sample 661

Rank test	Intensity	Attributes							
		Colour		Flavour		Taste		Texture	
		Yes	No	Yes	No	Yes	No	Yes	No
1	Least intensive								
2	Weak intensity								
3	Slightly week intensity								
4	Moderate intensity								
5	Slightly strong intensity								
6	Strong intensity								
7	Most intensive								

Sample 771

Rank test	Intensity	Attributes							
		Colour		Flavour		Taste		Texture	
		Yes	No	Yes	No	Yes	No	Yes	No
1	Least intensive								
2	Weak intensity								
3	Slightly week intensity								
4	Moderate intensity								

5	Slightly strong intensity								
6	Strong intensity								
7	Most intensive								

Appendix 14: Sensory test 7: Vegetables cooked using peanut and seeds butter (Pumpkin leaves)

1. Rate the intensity for the sensory attributes of **colour, flavour, taste and texture** for the samples 242 and 343

Sample 242

Ranking each sample for: colour, flavour, taste and texture

Ranking test		Colour	Flavour	Taste	Texture
1	Least intensive				
2	Weak intensity				
3	Slightly week intensity				
4	Moderate intensity				
5	Slightly strong intensity				
6	Strong intensity				
7	Most intensive				

Sample 343

Ranking each sample for: colour, flavour, taste and texture

Ranking test		Colour	Flavour	Taste	Texture
1	Least intensive				
2	Weak intensity				
3	Slightly week intensity				
4	Moderate intensity				
5	Slightly strong intensity				
6	Strong intensity				

7	Most intensive				
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Appendix 15: Sensory test 8: Sensory test for creamed pumpkins (nhopi) using different butter types: peanut (dovi) and seeds butter (runinga).

1. Observe the samples 331 and 441 and describe the appearance using two word from those listed

Sample 331

Appetising		colourful		Dull		glossy		Transparent	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

Sample 441

Appetising		colourful		Dull		glossy		Transparent	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

2. Assess the flavour and taste of the two samples using the 5-liket scale rating from extremely strong to absent.

	Ranking Scale	Flavour		Taste	
		331	441	331	441
1	Extremely strong				
2	Very strong				
3	Moderate				
4	Slight				
5	Absent				

3. Rank the texture of the samples: No difference, slight difference, moderate difference and large difference, very large difference.

	Ranking Scale	331	441
1	No difference		
2	Slight difference		
3	Moderate difference		
4	large difference		
5	Very large difference		

Appendix 16: Test 9: Okra sensory evaluation: Evaluation of the effects of different soda types.

1. Evaluate the strength of flavour and taste for the samples using the 5-point likert scale: extremely strong to absent.

	Ranking Scale	Flavour/Aroma			Taste		
		Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
1	Extremely strong						
2	Very strong						
3	Moderate						
4	Slight						
5	Absent						

3. Rank the texture of the samples: No difference, slight difference, moderate difference and large difference, very large difference.

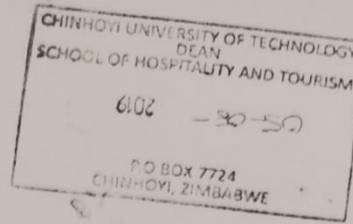
	Ranking Scale	Sample 1	Sample 2	Sample 3
1	No difference			
2	Slight difference			
3	Moderate difference			
4	large difference			
5	Very large difference			

Appendix 17: Observation chart okra and soda types
 Claim validation on the effects indigenous soda used to cook okra and related cuisines.

Observations /Claims	Soda type		
	Bicarbonate of soda	Musasa <i>wood utyora</i>	Maize cob <i>utyora</i>
Rising effect			
Colour changes			

Appendix 18: School permission letter

ANNEX 19 Form GRSD



CHINHOYI UNIVERSITY OF TECHNOLOGY RESEARCH PERMISSION LETTER

Student name... MARGARET NYAROTA
Student number... C18132249 M
Programme... DOCTOR OF PHILOSOPHY IN HOSPITALITY AND TOURISM
Approved research title
INDIGENOUS CULINARY CLAIMS AND MOLECULAR GASTRONOMY: DEVELOPING A MODEL FOR CULINARY TOURISM IN ZIMBABWE

TO WHOM IT MAY CONCERN

I hereby confirm that the above mentioned student is registered at Chinhoyi University of Technology for the programme indicated. The proposed study met all the requirements as stipulated in the University Policies and guidelines and has been approved by the relevant committees.

The proposed adheres to ethical principles as per attached outline of the Research Ethics Committee of the University. Permission is hereby granted to carry out the research as described in the approved proposal. May you please assist the student in any way possible

The objective of the research is to

ASSESS THE VALIDITY OF INDIGENOUS CULINARY CLAIMS THROUGH MOLECULAR GASTRONOMY FOR THE DEVELOPING OF A MODEL FOR CULINARY TOURISM IN ZIMBABWE

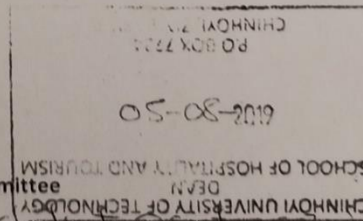
Best Regards

DR O. CHIKUTA

Name

Chairperson of School's/ Institute's Higher Degrees Committee

Tel: +263 773094501 E-mail: o.chikuta@chinhoyi.ac.zw



Appendix 19: Permission to use Food science students



CHINHOYI UNIVERSITY OF TECHNOLOGY
☒: P. Bag 7724, Chinhoyi ☎: 263-67-22203-5 📠: 263-67- 27214 E-mail: vicechancellor@cut.ac.zw

Vice-Chancellor's Office: Prof. D. J. Simbi - PhD, BSc, MIM, CEng, FZ'weIE, FICorr, FZAS, Hons FZ'weIE

Food Science Department
Chinhoyi University of Technology
P.Bag 7724.
Chinhoyi

23 May 2022

Dear Doc Mubaiwa.

RE: Permission to use the Food Science Laboratory and Food Science students for sensory evaluation experiments.

My Name is Margaret Nyarota, a lecturer and Dhpil student in the Hospitality and tourism Department. As part of my study, I have to conduct experiments to validate indigenous culinary claims, of which I need assistance from your department. I am asking for the permission to use your food science students as my respondents for the sensory evaluation tests. Though most of the sample preparations will be done in the hospitality kitchens, I may need your laboratories where necessary.

Your assistance would be greatly appreciated.

M Nyarota
Margaret Nyarota. (Mrs)

Approved/Not approved *M Mubaiwa* 23-5-2022
Chairperson Date



CHINHOI UNIVERSITY OF TECHNOLOGY
INSTITUTE OF LIFELONG LEARNING AND DEVELOPMENT STUDIES
CENTRE FOR LANGUAGE AND COMMUNICATION STUDIES

EDITORIAL CERTIFICATE

DATE 30 JUNE 2023

PhD Thesis Author: Margaret Nyarota

THESIS TITLE: **Indigenous Culinary Claims and Molecular Gastronomy:
Developing a Model for Culinary Tourism in Zimbabwe.**

To Whom It May Concern

This letter confirms that the above mentioned thesis was edited by a professionally qualified English Language specialist. The Editor in question has a Master and B.A. Honours of Arts Degree in English and a Post Graduate Diploma in Media and Society Studies.

The proofreading and editing attended to mechanical language issues only. The editor made no effort to address substantive matters of content covered in the thesis. Similarly, arguments advanced by the researcher in the thesis, whether tenable or untenable, were not altered except in cases where there were not articulated succinctly.


The author of the thesis can accept or reject the grammatical and syntactical alterations done by the editor.

Yours sincerely

Washington Chirambaguwa
(MA English, PG Dip Media and Society Studies, BA Hons English and Communication)

W Chirambaguwa

Appendix 21: Plagiarism check report

		Similarity Report ID: oid:6447:160163787	
PAPER NAME	final____.docx	AUTHOR	Margret Nyarota
WORD COUNT	109209 Words	CHARACTER COUNT	585105 Characters
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