

**ASSESSMENT OF FOOD SAFETY KNOWLEDGE AND ATTITUDES OF
STREET FOOD CONSUMERS IN THE KUMASI METROPOLIS**

BY

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CERTIFICATION

I hereby declare that this submission is my own work towards the Master of Philosophy Degree in Sociology. To the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of this and any other University, except where due acknowledgement has been made in the text

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DEDICATION

I dedicate this work to my late mother, Madam Mercy Adu Boafo

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I will like to give praise and thanks to the Almighty God for His guidance and protection throughout my life and for seeing me through my graduate studies.

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ABSTRACT

The street food sector plays an important role in cities and towns of many developing countries contributing economically and helping to meet the food demands of city dwellers. However, there are major health implications that emerge from the consumption of street food. This study employed a cross-sectional design to explore in depth the food safety knowledge and attitudes of consumers regarding street food safety in Kumasi. Consumers from three different suburbs in the Kumasi Metropolis (Krofrom, Aboabo and Ayigya) were conveniently selected to participate in the study. The quota sampling technique was employed to select respondents proportionally as they appeared in the population. Employing the quantitative methods, questionnaire were tools utilized to collect primary data for the study. The data collected was coded, entered, cleaned and analysed using the SPSS software programme. The results showed that majority of the consumers (61.0%) expressed appreciable food safety knowledge. A high percentage of consumers (64.5%) responded positively to the food safety attitude indicators. However the study found that majority of the respondents were ignorant of the process of storing fresh meat in a refrigerator. The bivariate analysis conducted to determine the relationship between socio-demographic characteristics of consumers and their knowledge on food safety revealed that food safety orientation, level of education, marital status, community of residence, and economic status as socio-demographic factors significantly ($P < 0.05$) related to food safety knowledge. The sex and age of consumers however did not significantly relate to food safety knowledge. The study on this base therefore recommends that Government through the Ministry of Health and Ghana Health Services should embark on food safety education programmes to inform the general public of the need to ensure good food safety practices. Outreach programmes should be conducted in various communities where people are less likely to have proper knowledge to educate them on food safety. Finally, it is recommended that street food consumers take advantage of the mass media to learn food safety attitude and correspondingly acquire the necessary knowledge regarding food safety.

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LIST OF ABBREVIATIONS

CB	-	Consumer Behavior
CDC	-	Centre for Disease Control
CDPC	-	Centre for Disease Control and Prevention
CI	-	Consumer International
CMAJ	-	Canadian Medical Association Journal
EPOC	-	Epidemiology of Constipation
EU	-	European Union
FAO	-	Food and Agricultural Organization
GSA	-	Ghana Standards Authority
ILO	-	International Labour Organization
SF	-	Street Food
SFS	-	Street Food Sector
UNAIDS	-	United Nations' Program on HIV and Aids
USA	-	United States of America
WHO	-	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The issue of food safety is very crucial as millions of deaths and ailments have been attributed to the consumption of unwholesome food particularly street foods (Cress-Williams, 2001). The street food sector plays an important role in cities and towns of many developing countries economically and in meeting food demands of city dwellers (Cress-Williams, 2001). It contributes substantially to household food spending and provides income to many female-headed households. It is estimated that street food contributes significantly to the daily diet of urban consumers in developing countries (Suneetha, Manjula and Depur, 2011). Furthermore, the World Health Organization (WHO) has hinted that, the street food sector plays a role in meeting food requirements of commuters and urban dwellers in many cities and towns of developing countries (WHO, 1996). Tambekar, Jaiswal, Dhanokar, Gulhane and Dudhane, (2008) note that Street foods feed thousands of people daily with several varieties of foods that are relatively affordable and easily accessible. Street foods are well appreciated by consumers, because of their taste, low price and availability (Canet and N'Diaye, 1996).

However, some researchers (Mensah, Amar-Klemesu, Hammond and Haruna, 2002; Barro, Ouattara, Nikiéma, Ouattara and Traoré, 2002) argue that, in spite of the enormous benefits of street food, there are major health implications that emanate from its consumption. The causes of these health implications include the spread of food borne illnesses (Mensah et al., 2002, Barro, Bello, Aly, Ouattara, Ilboudo and Traoré, 2006). In this regard, both the developed and developing world prioritize food

safety, given the fact that several food borne illnesses and deaths often result from unsafe food and inadequate food safety knowledge and attitude (Pilling, Fan, Huang, Kaul and Gomer, 2009).

Food safety has assumed a public health priority in recent times, given the large number of people who take their meals outside the home. In this view, consumers of street food are exposed to food borne illnesses that originate from food stalls, restaurants, and several other food outlets. In Ghana, street foods are prepared, processed and sold to the public at various bus terminals, by the roadside or by itinerant vendors (Mensah et al., 2002). In view of this, Barker, Amoah and Drechsel (2014) argue that there should be significant interventions to protect the health and safety of street food consumers.

The diversity among consumers' purchasing trend is based on a variety of factors, including socio demographics and socio-economic status (Wilcock, Pun, Khanona, and Aung, 2004; Ababio et al., 2012). This implies that the socio-demographic characteristics of a particular society have greater influence on the knowledge, attitude and behaviour of the people regarding food safety knowledge and attitude. According to Nguyen, Wilcock and Aung (2004), consumers' knowledge regarding food safety is largely influenced by socio-demographic characteristics. Simply put, whether or not a person will be knowledgeable in food safety is to a large extent dependent on the level of education of that person, their parental upbringing, the community and the age of that person among others. It is documented that, overall, consumer attitudes towards food safety in general differ according to socio-demographic factors such as gender, age, educational level and economic status (Ababio et al, 2012).

1.2 Problem Statement

Urbanization in the Sub-Saharan Africa coupled with dietary lifestyles, social and structural changes have caused and increased demand for street foods (Canet and N'Diaye, 1996). In addition, to the dietary relief to both urban and rural dwellers, street food also account for a part of the family income, daily diet and contributes towards meeting the nutritional requirements (Chakravarty and Canet, 1996; Van't Riet, Burger, Bonthuis, Jeekel, and Bonjer, 2004).

The Food and Agricultural Organization (FAO) however, indicates that contaminated food contributes to 1.5 billion cases of diarrhoea in children each year and this results in more than three million premature deaths in the world, which include both developed and developing nations (FAO, 2000). Similarly, according to the World Health Organization (WHO), unsafe food accounts for the deaths of an estimated two million people annually including children globally (WHO, 2009). A report by the Food and Agricultural Organization in 2003 also revealed that over nine thousand (9,000) persons die in the United States of America (USA) due to food and waterborne diseases (FAO, 2003).

The WHO estimates that approximately one million children under five years of age are reported dead each year from diarrhoea diseases for consuming contaminated food and water in the South East Asia (WHO, 2002). Food-based illnesses continue to increase due to the globalization process that has distorted the borders among the markets of agricultural–food products and the prevailing technological innovations that have also assumed dominance in the food sector (Gil, 2002; Banati, 2003). From the preceding reports, food safety appears very fundamental to human existence and

therefore comes as no surprise that programmes geared toward sensitizing the public on food safety are fully embraced worldwide.

The street food literature in Ghana has mostly explored issues relating to the vendors of street food in the street food sector (Rheinländer, Olsen, Bakang, Takyi, Konradsen and Samuelsson 2008). To get a broader picture of the street food sector and to better explain issues evolving from street food business, the consumers' knowledge and attitude of street food safety should also be investigated. On this premise, this study sought to explore in depth, consumers' knowledge (awareness) and attitude (understanding) of the various aspects of food safety regarding street food consumption.

Several researchers (Wilcock et al., 2004; Ababio et al., 2012) have indicated that there is a relationship between socio-demographic characteristics and food safety knowledge, it is still not clear which specific socio-demographic characteristic best explains or predicts food safety knowledge. This research therefore seeks to identify among the various demographic characteristics of the consumer, the one that directly relates with food safety knowledge.

1.3 Objectives of the Study

The main objective of this study was to examine food safety knowledge and attitude of street food consumers in Kumasi. Specifically the study sought to:

- 1 Examine consumers' knowledge regarding food safety in the street food sector.
- 2 Determine the relationship between consumers' socio-demographic characteristics and knowledge of food safety
- 3 Assess consumers' attitude towards food safety in the street food sector.

1.4 Research Questions

The study set out to address the following questions:

1. What is the level of consumers' knowledge regarding food safety in the street food sector?
2. Is there a significant relationship between consumers' socio-demographic characteristics and knowledge of street food safety?
3. What are the attitudes of consumers towards food safety in the street food sector?

1.5 Research Hypothesis

H₀: There is no significant relationship between consumers' socio-demographic characteristics and knowledge of food safety

H₁: There is a significant relationship between consumers' socio-demographic characteristics and knowledge of food safety

1.6 Significance of the Study

This study, with its quantitative focus on the street food sector will complement and add to the existing research that have focused largely on food safety and hygiene in the street food sector. By exploring the knowledge and attitudes of street food consumers regarding food safety, policy makers and regulatory bodies would be more informed and this would help enforce laws on food safety and scale-up existing programmes and interventions which are geared towards ensuring the safety of the public.

Findings of this study will help in planning health-education intervention programmes for food consumers, which will improve on their knowledge and attitude. This would

ensure that consumers are guarded against the contraction of food-borne diseases, which in turn will reduce the morbidity and mortality related to consumption of contaminated food.

In addition, unveiling the relationship between consumers' demographic characteristics and their knowledge regarding food safety will aid key actors like (Consumer International) on how and where to direct their advocacy about food safety. Lastly, the findings of this research will enhance the development and enforcement of appropriate food safety legislations in Ghana.

1.7 The Scope of the Study

For clarity of the study, the scope of the study was summarized into two sections, namely; geographical and contextual scopes.

1.7.1 Geographical Scope

The study was carried out in three Suburbs in Kumasi, namely Ayigyaa, Aboabo, and Krofrom. These areas were selected because they form part of the concentration points of street food vending. To ensure equal representation of the respondents in the selected areas consumers were selected from each of the Suburbs in order of the proportions they occurred in the population.

1.7.2 Contextual Scope

The study investigated the knowledge and attitude of consumers towards food safety in the street food sector in the Kumasi Metropolis. Consumers' knowledge in this study encompassed how street food consumers are aware of food safety practices when patronizing street foods. Additionally, the attitude of street food consumers embodied the understanding of consumers about various food safety aspects. Finally,

the emphasis of the study was on consumers who patronized street foods, particularly, at age 18 or above in the three selected areas.

1.8 Organization of the Study

This report is organized into five chapters. Chapter one is the introductory chapter which describes key themes such as background of the study, statement of the problem, research questions and research objectives. Information on the significance of the study, scope, organization of the study report and conceptual and operational definitions are presented in the section as well. Chapter two deals with a thematic review of the extant literature on the following: theories underpinning the study, food safety knowledge, street food, food safety attitude and other relevant themes to address the objectives of the study. Chapter three presents information on the research methods employed in the study. it details the research design, data collection procedures and data analysis techniques. Chapter four deals with a presentation and discussion of the study results, which is divided into subsections that correspond to the objectives the study, set out to achieve. Chapter five being the last, presents information on the summary of the study's major findings, recommendations and the conclusion

1.9 Conceptual and Operational Definitions

This section of the chapter expresses the under listed words as they are conceived in the literature and how they (words) are applied in the context of this report. The operational definitions are italicized.

Consumer: This is defined as a person who purchases goods and services for personal use.

Operationalizing consumer in this context, this study defines consumer as a person who purchases ready to eat food in the street.

Knowledge: Knowledge is a set of understandings, one's capacity for imagining and one's way of perceiving.

In the context of this study, knowledge is interpreted as the awareness that certain actions and inactions contaminate food.

Attitude: Attitude is a way of being, a position. It demonstrates the intermediate variable between the situation and the response to this situation. It expresses the possible practices for a subject submitted to a stimulus, that subject adopts one practice and not another.

*In the context of this study, **attitude** involves the understanding of consumers about various food safety aspects.*

Street food: The definition of street food given by the Food and Agricultural Organization (2013) posits that, the practice encompass the ready-to-eat beverages and foods cooked and/or traded by vendors and cooks particularly in the open or an enclosed public location for quick consumption or taking food home to eat without further cooking.

Food safety: The food and agricultural organization defines food safety as a scientific discipline describing handling, preparation, and storage of food in a way that prevent foodborne illness (FAO, 2009).

In this context, food safety implies the assurance that food will not cause harm to the consumer when it is eaten according to its intended use.

Street food trade - Like other informal sector enterprise, street food trade are characterized by the small scale of the operation, use of traditional food processing technologies, and low capital costs that allow ease of entry into the sector(Tinker and Fruge 1982).

In this context, street food trade involves all food sellers engaged in the sale of ready to eat (RTE) foods in the streets of Krofrom, Ayigya and Aboabo.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter explores the studies that have looked at food safety knowledge and attitude with particular emphasis on street food consumers. The relationship between consumers' demographic characteristics and consumers' knowledge is further reviewed. The conceptual framework explaining the relationship between food safety knowledge and socio-demographic characteristics is presented. The review commences by exploring the theoretical underpinnings relevant to the work and positions the study in a sociological perspective.

2.2. Theoretical Underpinnings

To position the work in the scholarly context, it has to be expressed theoretically. The consumer behavior theory was employed to address the phenomenon of consumer knowledge and attitude about food safety.

2.2.1 Consumer Behavior Theory

Different approaches have been adopted in the study of consumers' decision-making, drawing on divergent traditions of psychology. Authors suggest different typological classifications of these works with four major approaches. Each of these four approaches presents alternative model of man, and emphasizes the need to examine quite different variables (Foxall, 1993). The following concepts are introduced briefly to identify consumers' knowledge and attitudes about food safety: Economic Man approach, Psychodynamic approach, Behaviorist approach and Cognitive approach.

Economic Man Approach

This approach portrays man as entirely rational and self-interested, making decisions based upon the ability to maximize value while expending the minimum effort (Richarme, 2007). This implies that the consumer will buy food where he/she will get his money's worth. According to this principle, in order to behave rationally in the economic sense, as this approach suggests, a consumer would have to be aware of all the available consumption options, be capable of correctly rating each alternative and be available to select the optimum course of action (Shiffman and Kanuk, 2007). This implies that consumers are not motivated by their level of knowledge and attitudes in food safety but seek what food the meager money can purchase.

2.2.2 Psychodynamic Approach to Consumers' Decision Making

The psychodynamic tradition within psychology is widely attributed to the work of Sigmund Freud (Stewart, 1994). This view posits that behavior is subject to biological influence through instinctive forces or drives which act outside of conscious thought (Arnold, Steven, Walsenburg and Smith, 1993). While Freud noted three aspects of the psyche, namely the Id, the Ego and the Superego (Freud) other theorists working within this tradition, most notably Jung, examined different drives (Ribeaux and Poppleton 1978). The fundamental element of the psychodynamic approach is that behavior is determined by biological drives, rather than individual cognition, or environmental stimuli. The study notes that consumers' decision-making is both psychologically and environmentally sensitive. The explanation in this context is that, consumers' decision-making is motivated by cognitive stimulus. Thus, the consumer does not just decide what to buy but the intellectual buildup of the consumer influences their decision-making process. To this end, it can be argued that the

decision of the consumer to buy either hygienic food or either wise is predetermined by the biological make by the individual according to Freud. The food safety knowledge or attitudes do not drive consumers to purchase from a particular food stand.

2.2.3 Behaviorists Approach to Consumers' Decision-Making

The behaviorist theory posits that behaviour can be learned by external events and thus largely discredited the psychodynamic approach that was predominant at the time. Fundamentally, behaviorism is a family of philosophies stating that behaviour is explained by external events, and that all things that organisms do, including actions, thoughts and feelings can be regarded as behaviours. The most influential proponents of the behavioural approach were Ivan Pavlov (18-1936) who advanced classical conditioning, John Watson (1849-1963) who rejected introspective methods and Burrhus Skinner (1904-1994) who developed operant conditioning. Each of these developments relied heavily on logical positivism that objective and empirical methods used in the physical sciences could be applied to the study of consumer behaviour (Eysenck and Keane, 2000). Consumer' behavior regarding street food can be explained using the operant conditioning. Consciously exposing the consumer to the purchase of street food frequently will cause the consumer to develop the habit of buying food from the street. What activity the person is conditioned to do manifests in the persons' behavior. If the person is conditioned to develop the habit of liking safe food sold on the street, apparently, the person will not like unsafe food sold on the street. The operant conditioning tool is very effective in orienting people in a particular activity, which becomes part of the person.

2.2.4 Cognitive Approach to Explaining Consumers' Decision Making

In sharp contrast to the foundations of classical behaviorism, the cognitive approach ascribes observed action (behavior) to intrapersonal cognition. The individual is viewed as an information processor (Ribeaux and Poppleton 1978). This intrapersonal causation clearly challenges the explicate power of environmental variables suggested in behavioral approaches, however an influential role of the environment and social experience is acknowledged, with consumers actively seeking and receiving environmental and social stimuli as informational inputs aiding internal decision making (Stewart 1994).

The cognitive approach is derived in a large part from intellectual thinking, which can trace its roots back to early philosophers such as Socrates who was interested in the origins of knowledge (Bandura 2001). Author Aristotle proposed the first theory of memory and Descartes who explored how knowledge is represented mentally in his meditations (Sternberg, 1996).

The study, based on this principle argues that consumers intrinsically possess the ability to perceive what happens in the environment they find themselves. The persons' innate ability coupled with the environmental occurrences interact and presents to the individual the effort to, conceptualize and contextualize the phenomenon, helps the person to pursue a particular cause of action. Patronage of street food is a practice that has come to stay but as to whether a person will be armed by the safety of the food or not is according to this principle dependent on the innate ability of the person to decipher what is hygienic or unhygienic.

2.3 Sociological Perspective

This section of the study positions the study in the sociological context to reflect the essence of the topic in sociological realm.

2.3.1 The Symbolic Interactionist Perspective

Symbolic Interactionist perspective otherwise known as symbolic interactionism has been acclaimed as a major framework of sociological perspective. The perspective posits that individuals assign and depend upon meanings in the process of social interaction. The origin of symbolic interactionism is traced to Max Werber's notion that individuals act on the basis of the meaning they attach to their world (Assimeng, 1997).

It addresses society by examining the subjective meanings that individuals assign to object, events and behaviors. The theory places emphasis on subjective meanings since it is argued that people behave based on what they believe and not just what is objectively true. Juxtaposing this principle to the analysis of consumers' knowledge and attitude about food safety, the claim can therefore be made that, consumers' knowledge and attitude about food safety is informed by the meaning that they (consumers) attach to the food they intend to buy and not necessarily the general knowledge or attitude put out there either by literature and established institutions.

The argument proceeds that, though the public knowledge and attitude put forward undoubtedly hold but the individuals' subjective interpretation of the situation is very fundamental according to this perspective. This is so because the perspective notes that people behave based on what they believe and not just what is objectively true. This further buttresses the point that though the environment where the food is sold

might be empirically not conducive for food safety but the subjective meaning the buyer attaches to the food will make the buyer patronize irrespective of the awareness and the understanding (attitude) the person is endowed with regarding various aspects of food safety. Another dimension is the fact that consumers are motivated by the relationship that exists between the consumer and the vendor to patronise the food. How the vendor treated the consumer will either bring back the consumer to buy or refuse. To this end, it can be established that the meaning that the consumer attaches to the interaction between the two, drives the consumer to buy from a particular vendor and necessarily the food safety knowledge or the attitudes that motivates consumers to patronise a particular street food.

2.4 Consumers' Attitudes towards Safety of Street Food

Literature has it that, overall, consumer attitudes towards food safety in general differ according to demographic and socio demographic factors such as gender, age, educational level and economic status (Norazmir, Noor, shafurah, Ajau and Norazianshah, 2012). This implies that the behavior of consumers towards food safety is dependent on the demographic dimensions of the consumer. So the claim can be made that ones' age, gender, educational level and economic standing will determine where that consumer will buy food. Roseman and Kurzynske (2006) espouse this notion further. The writers intimated that, men were more likely to exhibit food safety knowledge than women regarding street food safety. The survey results according to them also indicated that the prevalence of most risky behaviors also increased with increasing socio-economic status.

Furthermore, elsewhere in Belgium, Verbeke and Viaene (1999), purported that, relative to female consumers, male consumers attached more importance to food

safety. In a study carried out by Burger (1998), he found that there were significant gender differences in the perceptions of the safety of fish. This buttresses the claim that food safety behavior of consumer is demographically determined. The impression created is that in Belgium, food safety is demographically determined. If in the developed countries, food safety is gender specific then the case of a developing country like Ghana has to be explored to either confirm or refute that assumption.

2.4.1 Level of Awareness of Food Borne Diseases by Consumers

Knowledge is the awareness of familiarity gained by experience of a fact or situation. Knowledge of the consequences of unsafe food hygiene practice can enhance adherence to food safety guidelines. Empirical studies on food hygiene have been done carried out across the globe. In Philippines, a survey on food safety knowledge and practice of street food vendors in a university campus in Quezon City (Azanza, Gatchalian and Ortega, 2000). Similarly, Okojie, Wagbatsoma and Ighoroge (2005), also carried out a study to assess the knowledge and practice of food hygiene by food handlers in a Nigerian University. A descriptive, cross sectional study was carried out on randomly selected for handlers operating on the campus. 102 respondents were interviewed and inspected using a structured questionnaire administered by researchers. The study showed a majority of 90 (88.2%) of the respondents as females and these had a predominantly poor level of food safety knowledge. The practice of steering and reheating left over was a very low and was practiced by 15 (30.41%) of the respondents, which was a very low frequency of hand washing. Inspection of food handlers showed a low level of personal hygiene. Only 31 (30.41%) had pre-employment medical examination and 49 (48%) had received any form of health education.

The level of consumer awareness of safety of food can be categorized either as high or low. A study conducted by Angelillo Viggiani, Greco and Rito (2001) in Italy to assess knowledge concerning foodborne diseases and food safety issues among consumers identified that the majority of food consumers who had attended a training course had high knowledge toward foodborne diseases control and preventive measures. On the contrary, Jay, Cormar, and Govenlock, (1999) indicated that less knowledge in food handling practices account for food borne disease. This is vital as studies by Djuretic et al., (1996) and Evans and Honkapohja (1998) have demonstrated that the primary elements responsible for the outbreaks of food contamination in England and Wales among, individuals were low food safety knowledge.

Numerous consumers are ignorant that inadequate food safety knowledge has accounted for the food contaminations in the home, trusting that the obligation lies rather with food makers or restaurants to ensure food safety (Worsfold and Griffith, 1997). Sockett (1995), stress that most people do not know the fundamental guidelines of food cleanliness. Conversely, studies carried out showed that respondents did know which foods were contaminated (Ingelfinger, 2008). This implies that consumers' knowledge in food safety concerning the review literature is relatively.

Mukhola (1998), in assessing the factors influencing the safety and quality of street foods in a rural area in Limpopo noted that the knowledge and attitude of both street food vendors and consumers demonstrated little knowledge regarding the proper preparation and storage of food as well as environmental conditions that may be detrimental to health. The author further noted that, 64.4% of the respondents

(consumers) confirmed that street food is sold under unacceptable conditions and these needed improvement (Mukhola, 1998a).

From the preceding literature, it is evident that food safety knowledge among consumers is relatively low so the attempt to explore the phenomena in Kumasi is not out of place. The effort will not only yield consumers' level of awareness, which will facilitate policy modification but will also prompt food vendors to attach importance to their business.

2.5 Consumers' Knowledge of Street Food Safety

The association between knowledge and food safety according to (Simelane, 2005), is often explained through the Knowledge Attitude and Practice (KAP) model. Knowledge accumulates through the learning process of both formal and informal instruction, personal experience and experimental sharing (Glanz and Lewis, 2002). Traditionally, it has been assumed that knowledge is automatically translated into behavior (Glanz and Lewis, 2002). Notwithstanding, behavior change authors and experiences in the HIV field, have noted that knowledge alone does not translate into appropriate behavior modification (Shisana and Simbayi, 2002, Glanz and Lewis, 2002, UNAIDS, 2004). Knowledge however is relevant and it is found to be vital in the cognitive processing of information in the attitude-behavior relationship (Simelane, 2005).

To this end, attitude includes evaluative concepts associated with the manner people think, feel and behave (Keller, 2001). It comprises a cognitive, emotional and a behavioral element indicating what one know, how one feels and what one does (Keller 2001). In the context of this study, attitude is defined to include the understanding of consumer regarding various aspects of food safety. Rutter and Quine

(2002) argue that attitudes may influence one's intention to perform a given behavior or practice. In furtherance, the authors emphasized that attitudes and behavior have correlations. For instance if a person has a positive attitude towards appropriate hand washing skill, they are more probable to wash their hands before and after handling food (Simelane, 2005). However, some social scientists have argued that KAP surveys are not necessarily adequate or sufficient to provide information particularly for programmatic planning. It is evident that critical elements relating to a variable may not be captured in the use of questionnaire and that in-depth information gathering using qualitative methods may be additionally beneficial in eliciting information, as surveys fail to explain the logic behind the behavior (Launiala, 2009).

Another concern is that there is an assumption that there exist a direct relationship between knowledge and behavior. In health related studies for instance, however, it has been found that knowledge is not the only factor that influences treatment-seeking practice and in order to change behavior, health programs need to address a number of issues including socio-cultural, environmental, economic and structural factors (Launiala, 2009). Behaviorists further add that a number of factors can influence one or more of the KAP variables such as self-esteem, self-efficacy and misconception (Keller, 2001, Ajzen, 2002, Glanz and Lewis, 2002). A few studies have looked at this aspect of behavior change, including behavioral models in food handler training, and are discussed later.

Food safety requires proper handling from production through consumption. Although standards in the United States are among the highest in the world and consumer guidance on proper food handling is available through magazines, newspapers, food labels, and other sources, mistakes still occur. As put forward by Bean, Seifert, Chen,

Sacks and Scheller (1997), foodborne disease in the United States reported to the Center for Disease Control (CDC) between 1988 and 1992 totaled 2,423 outbreaks causing 77,373 persons to become ill. This obviously indicates lack of knowledge about food safety on the part of the consumers who fell victim of that sad event. One will now wonder that if in the developed country like USA is experiencing an outbreak of disease resulting from unhealthy practice, what can be said about a developing country like Ghana.

Similarly, Raab and Woodburn (1997) showed that, respondents were not good at identifying either the food borne illness or the groups of people particularly at risk for food poisoning. They also found that 40% of the 100 Oregon food preparers believed either that contaminated foods could not be made safe to eat or they did not know how to do so. Worsfold and Griffith (1997), theorize that many consumers are unaware that (at least 60%) food poisoning originates in the home, believing that the responsibility lies instead with food manufacturers or restaurants. On the contrary, surveys conducted in 1986 and 1995/1996 expounded that respondents did know which foods were at high risk from food poisoning, but knowledge about how a food could be made safe to eat was limited (Raab and Woodburn, 1997).

Bryan (1988) notes that, food experts have identified obtaining food from unsafe sources, inadequate cooking or heat processing, improper cooling, unequal time intervals between food preparations and eating and poor handling of food as the most common food handling problems by consumers. Fein, Lin and Levy (1995), have emphasized that consumers misperceive the nature of foodborne illness and the most likely pathogen source. The author advanced that consumers perceive foodborne disease as a minor illness the reason being that, unlike fever, food borne disease

occurs by eating a contaminated food. In sum, foodborne disease according to consumers is a choice implying that one chooses to eat contaminated food. Most consumers according to Williamson, Gravani and Lawless (1992) are of the view that illness is caused by food prepared other than the home. It can therefore be advanced that consumers' knowledge on street food safety is high. Issanchou has affirmed that consumers' are knowledgeable since they are critical as to where they buy what because it invariably affects their choice (Issanchou, 1996).

According to the food safety literature, the process of influencing the consumers to accept certain product is multidimensional. In the view of Sheth, Sisodia, and Sharma (2000), response of the consumer, in case of choice of food is not only based on sensory properties of the product and its physical status, but also associated with other factors such as previous knowledge, previous experience as well as consumers' attitudes and believes. What will make a consumer patronize a particular food item is dependent on several factors.

The study's conclusion on the knowledge of consumers regarding food safety is hereby summarized in this segment. Owing to the information reviewed, the study reinforces Deshpande, Farley, and Webster, (1993) submission that consumers worldwide are knowledgeable as to what they patronize. This was also reiterated by (Patterson, DeBaryshe, and Ramsey, 1989, Cronin, Brady, and Hult, 2000).

2.5.1 Consumers' Knowledge of Implications of Food Borne Diseases

This segment of the review, explores consumers' knowledge of what really constitutes foodborne disease. Admittedly, several practices from both consumers and food producers contaminate food regardless of the existing regulatory bodies and

institutions mandated to oversee food safety. From the works of Wilcock, Maria, Khanona and Aung (2004), they established that illness that affect man in the society since prehistoric times has been attributed partially to unhealthy food and dirty drinking water. Diseases that are caused by unhealthy foods are still among the dominant ill problems in the recent era (Barrett, Howells, Shanklin, Pilling and Brannon, 2008). In the thoughts of Worsfold and Griffith (1997), the world all over, both the affluent and the pauper are not immune to diseases caused by unhealthy food and dirty drinking water. Notably, the definition of ill health emanating from unhygienic food and dirty drinking water is been rendered unconcerned subject to global, regional and at the local level. (WHO, food safety undated)

Highlighting food borne diseases, Flint, Valdar, Shifman, and Mott (2005), note that quite negligible foodborne diseases generally can be linked to unhealthy foods. However, considerable attention is given to food related disease when there is an epidemic. Since diseases emanating from unhealthy foods are not easily identified, the intensity of the issue is often times not prioritized by stakeholders. The discovery that 1.8 million people have lost their lives because of consumption of unhealthy food appears unrecognized (WHO, 2004). The Stomach and Intestinal Inflammation fundamentally has been identified as the disease caused by food and other disease causing organisms easily through unhealthy food. That said, Flint et al. (2005) hint that, not all serious stomach and intestinal inflammation diseases emanate from unhealthy foods. In addition, emphasis was placed on the fact that unhealthy food diseases are not always the major cause of gastroenteritis. Moreover, surveys such as cross sectional explores to capture the occurrence of diagnosed acute stomach and intestinal inflammation that the community for a particular duration. A study

conducted in England retrospectively, revealed that annually above five reports a year per a person was identified.

Apparently, an intestinal disease research team in (2000) carried out another study to unravel similar phenomenon. The team strangely identified a whooping three fold over the previous study earlier on. From previous studies carried out in the UK, Australia, Canada, Ireland, and the United States, the results indicated that diseases emanating from the consumption of unhealthy foods were seen to be similar to the previous results States (Feldman and Banatvala, 1994; Palmer, Houston, Lervy, Ribero and Thomas, 1996, Flint et al., 2005). Hinted by the intestinal infections disease study team (2000) and Witte, Koopmans and Kortbeek, (2001), there is a similarity between the report from the study conducted in the UK and the one carried out in the Netherlands.

The study therefore notes that food borne diseases though is a major cause of numerous diseases, efforts geared towards addressing this menace is inadequate since diseases are ignorantly attributed to different events.

Significantly, it has been recognized by the World Health Organization (WHO) that, diseases resulting from unhealthy food constitute a wider ratio 60 percent of the public health problems the world all over and contribute immensely towards other illness, co-operated nourishing standing, less fight to diseases and loss of productivity (WHO, undated). The challenges of modernization relating to food safety presented by the association of all nations to trade among themselves (globalization) in the food supply system has deeply given rise to the international public health problem of diseases emanating from the consumption of unhealthy food.

This menace is increased by the increasing mechanization and trade of foodstuff production, quick expansion associated with improved preparation or consumption of food outside the home and the introduction of fresh resistant to antibiotics, disease causing organisms and vehicle for food (WHO food safety, undated). Food safety Literature advises that the scale of the difficulty needs to be established to be able to commence and withstand the efforts aimed at preventing foodborne diseases at both at the regional level and the international level. The World Health Organization in 2010 embarked on a global initiative to calculate the worldwide difficulty of diseases in conjunction with multiple associates in view of the data gaps relating to the true problem of foodborne diseases and its impact on development and commerce (WHO, 2010)

2.5.2 Food Safety

Generally, the main health hazard associated with street foods is bacterial contamination although pesticides residues, transmission of parasites, the use of unpermitted chemical additives, environmental contamination and limited access to safe water have also been noted as possible hazards (Abdussalam and Kaferstein, 1993, Arambulo and Almeida, 1994). The potential for contamination of street foods with pathogenic-organisms has been well documented and several disease outbreaks have been traced to consumption of contaminated street foods (Abdussalam and Kaferstein, 1993). The type of street food and how the food is prepared will inform the risk of microbial contamination. Food risk is influenced by food type and method of preparation, water availability, handling, exposure temperature, and holding time (Mathee, Von Schirnding, Byrne, De Beer, Letlape, Hobbs and Swanepoel, 1996). Generally, cereal and bakery products with low moisture content, products that have

been adequately sugared, salted, or acidulated, and some fermented products are less likely to support bacterial growth as opposed to dairy, egg, and meat products. Arambulo and Almeida (1994) have noted that foods that are cooked immediately prior to consumption are safer than those that have been cooked and stored at an ambient temperature. Other factors involved in causing microbial contamination include poor food preparation and handling practices, inadequate storage facilities, the personal hygiene of vendors, and a lack of adequate sanitation and refuse disposal facilities (Abdussalam and Kaferstein, 1993).

In Ghana, in a study that investigated the microbial quality of street foods sold in Accra, a couple of bacteria were the pathogens isolated from some food samples (Mensah et al., 2002). According to Abdussalam and Kaferstein, (1993), the health risk from street foods may be no greater than that posed by foods or dishes from other sources such as in restaurants. A study carried out in India found that the microbial quality of street foods was equivalent to, if not better, than that of foods bought from hotels and restaurants (Bapat, Rawal and Mascarenhas, 1992, Chakravarty-Kaul, 1996).

2.5.3 Consequences of Inadequate Food Safety Knowledge

Authors, McIntosh and Peckarsky (1994), define knowledge as the practices which in turn affects willingness to change current practices if it is learned that current practices are unsafe. Variably, Patil, Cates and Morales, (2005), indicated that food handling practices are known to differ from self-reported practices. This has been established as very fundamental by (Djuretic, Wall, Ryan, Evans, Adak and Cowden, 1996, Evans and Honkapohja, 1998) as the writers have indicated that the main factors responsible for the outbreaks of food poisoning in England and Wales during

1992-1994 and 1995-1996, respectively, were inappropriate storage, inadequate cooking or heating, and cross-contamination.

Food safety experts believe sporadic cases and small outbreaks at home are far more common than those cases constituting recognized outbreaks (Institute of Food Technologists' expert panel about food safety and Nutrition, 1995). If consumers misconstrue the origin and severity of foodborne illness, they are less motivated to change. Motivation to practice safe food handling requires a belief that someone is harmed by not doing so, and that new behavior will prevent illness (Shaffer, Fisher, Lucas, Dulcan, and Schwab-Stone, 2000). The author claims that the failure to associate at-home food handling practices with borne illness is a serious inhibition to convince people to discontinue potentially hazardous food handling behavior (Fein et al., 1995).

Food safety as put out by Henson and Traill is the inverse of food risk- the probability of not suffering some hazard from consuming a specific food (Henson and Traill, 1993). Potential undesirable residues in foods span a broad range, from natural (mycotoxins) and environmental pollutants (dioxins) to agro-chemicals (nitrates and pesticides), veterinary drugs, growth promoters, packaging components, and many more.

2.5.4 Knowledge of Potential Dangers of Contaminated Foods

According to Ghana Standards Authority (GSA), food contaminants are responsible for more than 200 diseases, ranging from diarrhoea to cancers (Daily Graphic, March 19, 2015). According to the world health organization (WHO), globally unsafe food accounts for the deaths of an estimated two million people annually, including children. Food containing harmful bacteria, viruses, parasites or chemical substances

is responsible for more than 200 diseases, ranging from diarrhoea to cancers. Changes in food production, distribution and consumption as well as changes to the environment; new and emerging disease-causing microorganisms etc. all pose challenges to national food safety systems. Increases in travel and trade enhance the likelihood that contamination of food can spread nationally and internationally.

2.6 Socio-Demographic Characteristics and Knowledge of Food Safety

In an attempt to establish the relationship between consumers' socio-demographic characteristics and their knowledge towards food safety regarding street foods, an in-depth exploration into the literature is vital.

Report from a study carried out by Roseman and Kurzynske (2006) stipulates that age, sex, income and educational levels influence food safety knowledge and attitudes of consumers. In addition, Norazmir, Noor, Shafurah, Shafurah, Ajau, and Norazianshah, (2012) found from their study that food safety knowledge is associated with the socio demographic and academic variable by increased food safety knowledge and age. However, Byrd-Bredbenner, Abbot, Wheatley, Schaffner, Bruhn, and Blalock (2008) submit that the link between demographic characteristics and food safety knowledge is often parallel.

It was evident in Roseman and Kurzynske study that, respondents with higher academic qualification showed a higher level of food safety skills than respondents with lower academic qualification. Equally, it was observed that male students at the tertiary level showed a higher level of food safety skills than their male counterparts at the secondary level. This study based on these observations posits that, education and food safety has a relationship. Apparently, the study also concedes that, the gap in the knowledge of food safety by the students is attributed to the age difference among

the males. This study can as therefore affirm that old age is correlational with food safety knowledge concerning males.

Conversely, the female students' report is different. The authors discovered that the female students at the secondary school level showed much food safety skills than the females at the tertiary level. The study attributed the reason to the fact that a large segment of the female students at the secondary level indicated that they still live with their parents implying that the students (females) still learn from their parents from home. The position of this study on this submission is that, since majority of the students admitted staying with their parents gave them the food safety knowledge, it shares Roseman and Kurzynske findings. However Wheatley et al., (2008) had a parallel idea.

As indicated, Socio-demographic characteristics have significant bearing on the outcome of research, Rane (2011). Aside highlighting the profile of the sample to the reader and evaluating the quality of the sample, groups' socio-demographic characteristics apparently influence their social behavior (Bas, Ersun and Divan, 2006). However, in a study conducted by Annor and Baiden 2011, Soares, Almeida, Cerqueira, Carvalho, and Nunes, 2012), they opined that demographic characteristics such as age and gender apparently do not appear to play a role in food safety knowledge of street food. However, results about the relationship between the level of education of street food vendors and their food safety knowledge appeared to be positive, Soares et al., (2012) noted. This means that as one attains higher education, the person's level of knowledge regarding food safety increases. On the contrary, the fact that a person is young or old will not directly or indirectly affect knowledge or attitude regarding food safety.

Similarly, Soares et al. (2012) affirm that, a positive correlation exists between the educational level and food safety knowledge of consumers while Annor and Baiden (2011) have an opposing view. Annor and Baiden (2011) have argued that a person's educational level does not guarantee a higher knowledge and attitude in relation to food safety is high. Considering the argument put forth by the writers above it still is not obvious whether socio-demographic characteristics of a group of people have a bearing on their knowledge and attitude regarding food safety (Mahon, Sobel, Townes, Mendoza, and Tauxe, 1999).

Sanlier (2010) observe that food safety knowledge and practices between male and female showed females' dominance in food preparation compared to male but in term of knowledge, male and female equaled. Recent study by Osaili and Forsythe (2009) identified that, level of food safety knowledge associated with the socio-demographic characteristics shows a positive correlation. This means that academic level and age which are both characteristics of socio demography, influence food safety knowledge positively. Jevsnik, Hlebec and Raspor, (2008) advise that, education must be provided to increase the level of knowledge of food safety. He underscored the fact that many borne illnesses have their roots in the household kitchen and it is at this level that the most effective controls can be applied. This stresses the relevance of consumer education and of the communication of information on emerging food borne hazards to consumers (Theo van de Venter, 2000).

Food safety

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent foodborne illness (Henson and Triall, 2003). This includes a number of routines that should be followed to avoid potentially severe health hazards.

Potentially, undesirable residues in foods span a broad range, from natural (e.g. mycotoxins) and environmental contaminants (e.g. dioxins) to agro-chemicals (nitrates and pesticides), veterinary drugs, growth promoters, packaging components, and many more. However, Kennedy, (1978) contributing to street food literature posits that, effort should be made to educate the public to the reality that there is no such thing as absolute safety.

Almost every food establishment uses processes and sells food in different ways. The general issues and key principles however remain the same, regardless of the style of operation. The organization advances that, all programs should contain what it terms the 'big three' factors that could cause food to become safe. Food must be kept out of harmful ways from human errors, but if food workers are not trained what they are, they will not know the importance of the factors in their operations. It chided that these basics can make or break us in one or maybe two food handling mistakes. The three basic principles that must be adhered to by all food managers and workers are:

- 1 Personal hygiene for food professionals
- 2 Time and temperature control
- 3 Cross-contamination prevention

Professional Personal Hygiene:

This is been perceived as not common to everyone. According to Friedmann (2007), the food service organization in the United States of America advise that food workers must adhere to the highest possible standards of personal hygiene to make certain that pathogenic microorganisms, physical or chemical hazards, do not contaminate food. High standards of personal hygiene also play an important part in creating a good public image, as well as protecting food. Hand washing, fingernails,

food worker illness policy (including exclusion of ill workers, cuts, burns, bandages etc.), hair uniforms, gloves use, jewelry, personal cleanliness, or unsanitary habits such as drinking, smoking, or spitting are all parts of defining personal hygiene standards. Poor hand washing is one of the leading causes of foodborne illness. It is noted that active hand hygiene is a concept that really helps (Friedmann, 2007a).

Cross-Contamination Prevention

This practice is explained by Food and Drug Authority (FDA), as the transfer of harmful microorganisms or substances to food and covers a multitude of potential food handling errors in all stages of food flow. This can happen at any given time. Characteristically, cross-contamination is characterized by food to food, hands to food or equipment to food. Ready-to-eat foods must receive the most care to prevent contamination.

Food Safety Policy

The food service organization frequently is dealing with employee turnover, so the job of training staff on professional hygiene, time/temperature, and cross-contamination control is never ending. The above mentioned issues contain lots of separate categories or steps to help keep the foodborne germs at bay. An overall “food safety policy” statement is a good idea to start with for all staff that focuses on the group’s responsibility to help control these three issues. It is up to each person in charge to help the staff individually understand their responsibility for food safety that is appropriate in their specific food handling tasks. Active managerial control means supervisors must monitor the crew’s adherence to your policy, make corrective actions, and set the example.

The food service (U.S.A) concludes that food safety is not just a matter of making a facility look clean – recounting the phrase “so clean you could eat off the floor.”

Sanitation is important, but do we really want to eat food off the floor anyway? No! The real mistakes can happen at any step in the flow of food through the facility from receiving, storage, preparation, cooking, holding, cooling, reheating, or serving. So attention must be paid to training, practicing, and controlling the basics of food safety in a facility (Martinez, Fearne, Caswell and Henson 2007).

Street Food Trade

Classically, street food enterprises like other informal sector occupation is typified by the small scale of the operation, use of traditional food processing technologies and low capital costs that allow flexible entry (Tinker and Fruge, 1982). Participant of street foods are mainly the urban poor and this feature has been noted by some as an initiative response or coping strategy on their part when denied access to more appropriate job structures. Atkinson (1992) notes that however the source of this view originated in the 1970s against the backdrop of economic expansion; the macro-economic context of the 1990s is very different and support of the informal sector should be noted as a remedy for the urban poor.

Particularly about its distinct nature, the informal sector is not enumerated by official data- collecting agencies; thus official statistics on the street food trade are virtually vague. Food and Agricultural Organization, Epidemiology of constipation (EPOC) and Bogor project studies, however, have contributed large amounts of money and made provision for competitive source of employment and income to numerous people. FAO for instance projects that there are approximately 100,000 vendors in Malaysia whose collective total annual sales amount exceeds \$2 billion (Dawson and Canet, 1991). EPOC as an institution realized an annual volume of trade of \$67

million in Bogor, a city of 250, 000 people, to \$2million in Mankikganj, a small provincial town of 38000 people

Street food trade serves as an important source of employment and income. According to EPOC, street food trade comprised from a significant proportion of six percent of the total labor force in Zinguinchor, Senegal and Mankikganj, Bangladesh to 15 percent and 25 percent in Iloilo city, the Philippines and Bogor, Indonesia, respectively, (Cohen, 1986). Street food vending entails hard work with long hours; the income derived is generally above earnings from alternative sources of employment.

The earnings of paid assistants, however, are often less. A study in Uganda found that most vendors earned a favorable wage--the majority earned more than the minimum government civil service wage (87 percent earned US \$5-\$20 per day) and none earned less than the minimum wage--but most assistants were paid less than US \$9 per month (Nasinyama, 1992).

2.7. Code of Hygienic Practices by Ghana Standards Authority

The Ghana Standards Authority (GSA) has developed a code of hygienic practice for street-vended foods. The code provides guidance in three principal areas, namely: suitable locations under which food should be sold, the caliber of people who should sell food and the processes under which the foods are prepared.

The locations should be areas, which are free from open gutters, refuse dumps, smoke, dust or other contaminants. Also roads to and from areas serving food should have adequate drainage while provision is made to allow for cleaning. Again, living quarters, toilets and areas where animals are kept should be completely separated from food handling areas. In addition, adequate ventilation should be provided to

prevent excessive buildup of heat, steam condensation and dust to remove contaminated air.

Concerning personnel handling the food, Ghana Standards Authority (GSA) advises that they (the personnel) must be trained and be made to undergo medical examination every six months. They should also wear suitable protective clothing, including head cover and footwear. When it comes to processing the food, raw materials or ingredients stored on the premises should be maintained under conditions that will prevent spoilage and contamination. Again, water used for washing utensils, food and hands should be safe and not be reused.

Specific Guidance to Consumers and Vendors

The Ghana Standard Authority advice that the following guidelines are adhered to, to help ensure food safety: The practice of keeping clean surroundings, separating raw and cooked foods, keeping food at safe temperatures, and using safe water and raw materials are the few guidelines given to ensure food safety.

2.8 Conceptual Framework

Conceptual framework is the building blocks which provides the pillars upon which research is conceptualized. The study therefore draws on this consumer decision model framework to well explain how consumers make decisions regarding of food purchase. Below is the framework and its components that illustrate consumer decision making.

2.8.1 Consumer Decision-Making Model

The consumer decision model (Engel-Blackwell-Miniard Model) was originally developed in 1968 by Engel, Kollat, and Blackwell and has been revised severally;

the latest publication of the model is depicted in figure 2.1. Apparently, many of the elements of the model are similar to that buyer behavior as developed by Howard and Sheth, 1969), however, it varies in the structure of presentation and the relationship that exist between the variables somewhat. In detail, the model is structured around a seven-point decision process: need recognition followed by a search of information both internally and externally, the evaluation of alternatives, purchase, post purchase reflection and finally divestment. These decisions are influenced by two main factors.

Firstly, stimuli is received and processed by the consumer in conjunction with memories of previous experiences, and secondly, external variables in the form of either environmental influences or individual differences. The environmental influences include: culture, social class, personal influence, family and situation. While the individual influences include consumer resource, motivation and involvement, knowledge, attitudes, personality, values and lifestyles (Blackwell and Miniard, 2001).

Entry to the model is through need recognition when the consumer acknowledges a discrepancy between their current state and some desirable alternative. This process is driven by an interaction between processed stimuli inputs and environmental and individual variables. After a need has been acknowledged the consumer embarks on a search for information, both internally through the consumers' memory bank of previous experiences, and externally. The authors argue that the model is suitable for use in explaining situations involving both extended problem solving and limited problem solving by modifying the degree to which the consumer engages in various stages of the model (Loudon and Della Bitta, 1993).

The alternative consumer choices are evaluated by the establishment of beliefs, attitudes and purchase intentions. This process of evaluation is influenced by both the environmental variables and the individual variables. Intention is depicted as the direct antecedent to purchase, which is the only outcome, tolerated by the model. Inhibitors are not explicitly depicted as mediating between intentions and purchase, however the environmental and individual influences are again said to act on purchase.

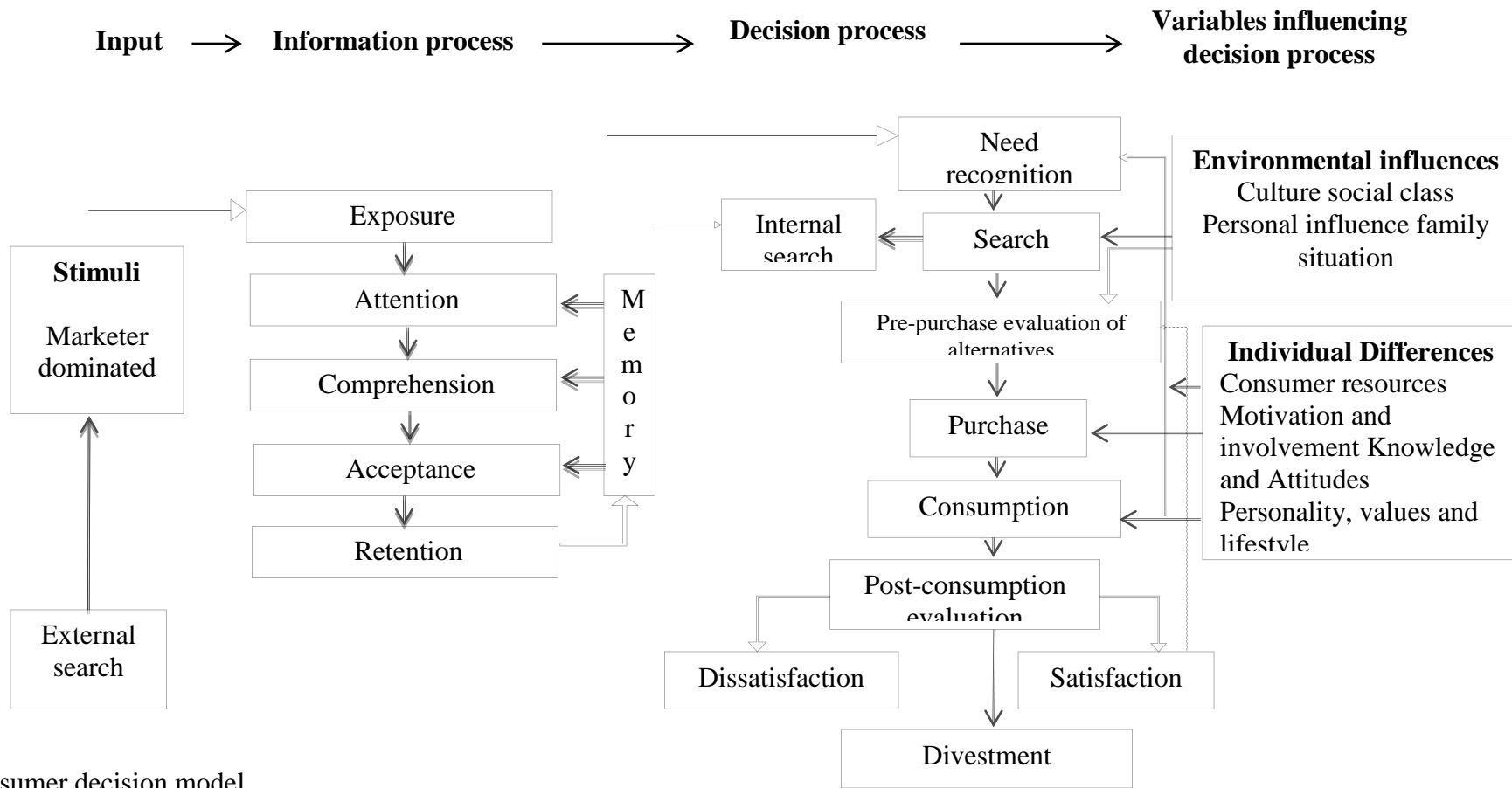
Situation is captured as an environmental influence, and while this factor is not clearly defined, it could include such factors as time pressure or financial limitations, which could serve to inhibit the consumer from realizing their purchase intentions (Van Tonder, 2003).

Consumption is followed by post-consumption evaluation, which serves a feedback function into future external searches and belief formation. Divestment is depicted as the final stage in the consumption process acknowledging that the product purchased is likely to be disposed of at some point post consumption

2.8.2 Critiques of the Model

The environmental and individual variables have drawn criticism due to the vagueness of their definition and role within the decision process (Loudon and Della Bitta, 1993). Explicitly, the influence of environmental variables is identified, but their role in affecting behavior is not well developed. Moving forward, the role of individual motives for purchase is only alluded to within need recognition, appearing to somewhat neglect a rich theoretical and important area of consideration (Bagozzi, Gurhan-Canli, 2002; Loudon and Della Bitta, 1993).

The model provides a clear depiction of the process of consumption making it easy to comprehend and intuitively pleasing (foxall, 1990). The mechanistic approach is however, criticized to be too restrictive to adequately accommodate the variety of consumer decision situations (Erasmus, Boshoff et al. 2001, Loudon and Della Bitta, 1993).



Consumer decision model

Source: (Blackwell, Miniard et al. 2001)

2.9 Chapter Summary

The literature showed that most of the food safety studies that have been carried out were actually conducted at a foreign context. Only few studies were carried out in the Ghanaian context so this study would explore the Ghanaian dimension of food safety knowledge of consumers of street food. Again, the literature basically captured studies that included (KAP) studies. Thus, knowledge, attitude and practices which involved both consumers and vendors but this study is limited to consumers' knowledge and attitude regarding food safety. With respect to socio-demographic characteristics and food safety knowledge, the literature identified most of the information to be foreign. Only on few occasions were identified from local researchers. Clearly, it was identified by majority of scholars that socio-demographic characteristics is directly associated with food safety knowledge. In the chapter that follows, the methods employed to collect data and consequently do the analysis are captured

CHAPTER THREE

RESEARCH METHODS

3.1 Introduction

This chapter describes the methods employed in the collection and analysis of data. It is sub-divided into study area, research design, target population, study population, unit of analysis, sample selection and sample size. Data collection tools and methods, sources of data, field problems, data management processes, validity and reliability tests and ethical issues related to study are addressed as well.

3.2 Study Area

The study, which assessed the knowledge and attitude of street food consumers about food safety, was carried out in the Kumasi Metropolis (more specifically, Ayigya, Krofrom and Aboabo). The unique location of Kumasi as a traversing point from all parts of the country makes it a special place in terms of the social, economic, cultural and political life of the country. Because of its central location, vibrant market and rich culture and history, the Metropolis serves as an urban destination accommodating a high migrant population comprising people from almost all the ethnic groups and regions in the country (Afrane, and Amoako, 2004).

The city has important educational and health institutions, which are operated by government, private and religious bodies (Solomon-Ayeh, Decardi-Nelson and Okoko, 2009). The commercial activities of the city cannot be underestimated. It has the largest single market in Ghana, which the inhabitants in and around the city patronise. This implies that the inhabitants need street foods because the nature of their work take them out of the house early morning and return home late. This therefore

compells most of the inhabitants to resort to street foods as their source of food. With the wide-spread reports of food poisoning by the media, it becomes important to assess the knowledge and attitude of consumers of street food in the Metropolis.

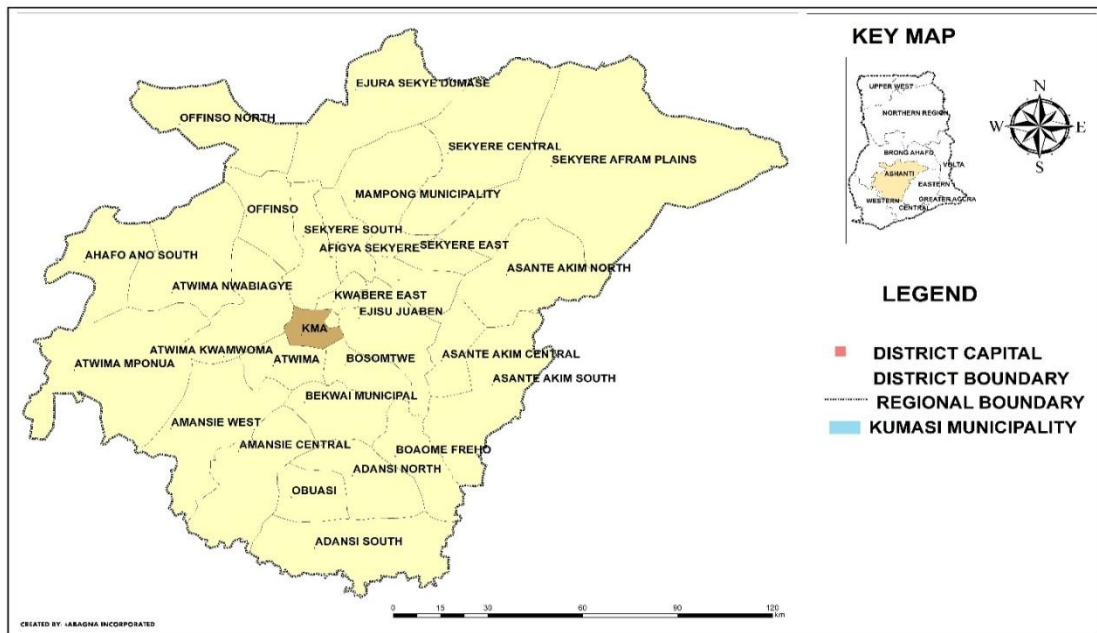


Figure 3.1: A Map of the Kumasi Metropolitan Assembly

Source: KMA, town and country planning department, 2010

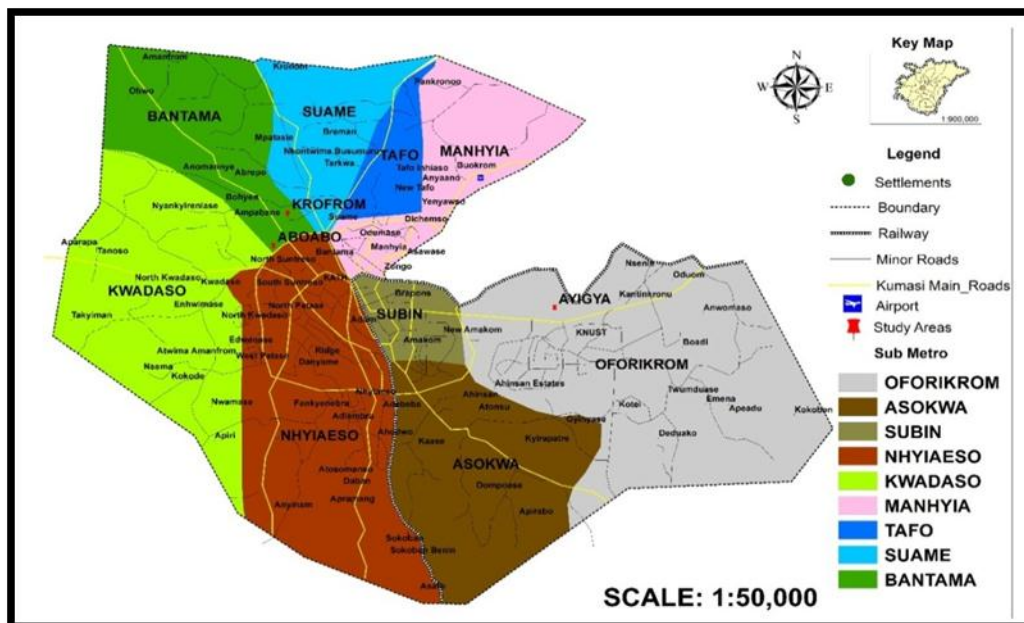


Figure 3.2 Map of Kumasi Showing the Three Study Areas

Source: KNUST GIS Laboratory, (2015)

3.3 Research Design

This study employed the cross-sectional design with a quantitative method of data collection to assess the knowledge and attitude of street food consumers regarding food safety. According to Lawrence and Keith (2005 cited in Quansah, 2009), a cross-sectional design has stronger likelihood of participation as it is for a single time. That notwithstanding, the cross-sectional research design, according to Bell (2004) is criticized because causal relationship is often cumbersome to make. In opposing the argument advanced against the cross-sectional approach, Denscombe (1998) argued that outcome from cross-sectional research may establish causal relationship when the phenomena have similar characteristics of interest. To this end, a cross-sectional research design can be used for studies that require detailed information about a phenomenon within a limited time span. Premised on the preceded attributes and arguments for the cross-sectional design, the study therefore employed the cross-sectional research design with a descriptive approach to examine the food safety knowledge and attitude of street food consumers in the Kumasi Metropolis.

3.4 Sampling Procedure

This section of the study embodied how, the sample for the study, target population and study population was defined. The unit of analysis and sampling technique are described as well.

3.4.1 Target Population

The target population for this study was all street food consumers resident in the Kumasi Metropolis. Explicitly, the target population for the study was street food consumers who were 18 years or above as at the time of the study. Consumers, 18

years were selected in view of the fact that, the Ghanaian constitution gives legal backing to people who are 18 years as matured and can decide for themselves.

3.4.2 Study Population

The study population embodies all the subjects possessing the characteristics of interest under investigation located at a defined territory. The study population is the subset of the target population. In this context, the study population is the sum of all consumers in the three study areas; Krofrom, Aboabo and Ayigya. The population for these suburbs were (16,435), (14,456), and (11,121) respectively (Ghana Statistical Service, 2010). The total population for the study was therefore computed as (42,012).

3.4.3 Unit of Analysis

Unit of analysis according to Kumekpor (2002) is the empirical units, objects and occurrences which must be observed or measured in order to study a particular phenomenon. Similarly, Katrina (2012) defines unit of analysis as the entity under study or who is being described or analyzed. The unit of analysis for this study comprised any consumer who patronize street food specifically from the selected areas (Krofrom, Aboabo and Ayigya) and was 18 years or more. Precisely these consumers were selected from food stands located in the three communities.

3.4.4 Sampling Technique

In order to establish that the sample represented consumers who patronize street food in the study population, different techniques were employed. Three communities in the Kumasi Metropolis were selected purposively. Purposive sampling according to Lecompte and Preissle (1993) involves selecting the cases to be included in the sample based on the judgment of the characteristics under study. In view of that, the

study areas were purposively selected because they (areas) constituted part of the concentration points of street food in the Kumasi Metropolis (Mensah, Owusu-Darko, Yeboah-Manu, Ablordey, Nkrumah, and Kamiya 1997)

Three (3) communities (Krofrom, Aboabo and Ayigya) being part of the concentration points of street foods were selected. That said, the commercial activities engaged in these areas necessitated the choice of the three suburbs as the study areas. In each of the selected communities, a proportion of street food consumers were conveniently selected as they occurred in the population of the study. Proportion or quota sampling Bailey (1978) argues, strives to represent significant characteristics of the wider population in proportions in the sample selected in which they (sample) can be found in the wider population. This ensured that all prospective study areas had equal proportion in the sample. This is further explained in Table 3.1.

Conveniently, street food consumers were selected from each of the three study areas to get three hundred and ninety six (396) respondents. This was accomplished by approaching consumers intending to or had already purchased the food in the streets of the selected areas. Out of the population, (156, 135 and 105) were selected from Krofrom, Aboabo and Ayigya respectively. Each consumer was selected based on the characteristics of interest.

3.4.5 Sample size

Often Sociologists are interested in the characteristics of large numbers of individuals. However, it is impossible for them to study all these people directly, so in such situation research studies concentrate on sampling (Giddens and Sutton, 2005). In the light of the above, the sample size for this study was 396 street food consumers who were 18 years or above in the three selected areas. Proportionally, (156), (135) and

(105) street food consumers were selected according to the size in which they occurred in the wider population of the study area. Table 3.1 gives illustration of how the sample size was arrived at. Lynch and Harper (1974), formula was used to derive the appropriate sample size.

Sample Size Computation

$$n = \frac{N}{1+N(d^2)}$$

Where n is the sample size; (N) was the sample frame and (d) represents the error margin (5%). Sample frame (N) for the study was (42,012) consumers while margin of error (d) was 5% ($5/100=0.05$).

Therefore, $n = 42,012/1+42,012 (0.05^2) = 396$ consumers

Table 3.1: Selected Communities; Target Population and Sample size

Study Location	Estimated Population	Proportion to the size of the population	Sample size
Krofrom	16,435	39.5%	156
Aboabo	14,456	34.0%	135
Ayigya	11,121	26.5%	105
Total	42,012	100%	396

Source: Researcher's Construct

3.5 Methods and Instruments for Data Collection

Booth (1995), indicates that research is simply about collecting data needed to answer a question and thereby helping to solve a problem. Data collection is defined as collecting information to unravel the empirical questions that had been observed in the study. This study employed the self administered questionnaire method in the data collection. The researcher together with three research assistants frequented the three

study areas (Krofrom, Aboabo and Ayigya); notably the markets, the lorry stations and the highly frequented streets of the three suburbs. Consumers, 18 years or above were conveniently approached and asked to voluntarily participate in the study. The purpose of the study was explained to the potential participants after which they were asked to give their consent before they completed the questionnaire. Consumers who could not read the questionnaire were guided by the research assistants.

3.6 Sources of Data

This study employed both primary and secondary data

3.6.1 Primary Data

Primary data was collected mainly using the questionnaire. Responses from the consumers constituted the primary data for the study. Through self-administered questionnaire, the study explored consumers' knowledge and attitudes towards street food safety. The information elicited constituted the primary data for the study. Moreover, information regarding the socio-demographic characteristics of consumers was also elicited using the questionnaire to complement the primary data for the study

3.6.2. Secondary Data

From secondary sources, published articles and research reports, as well as newspaper publications were utilized. Thus, rules and regulations that inform and guide the work of Ghana Standard Authority were also reviewed systematically. The information that emerged from these documents were utilized to complement as well as crosscheck other information revealed through primary data.

3.7 Field Problems and Limitations of Study

During the data collection process, quite a significant number of respondents requested for a token (money) before they could participate in the study. This difficulty was however resolved by explaining the purpose of the study to such respondents before participation. Participants were briefed that the study was for academic purpose and for that matter it was not a sponsored project. Furthermore, participants were informed about the occupational status of the researcher as a student.

Again, because of the busy schedule coupled with the educational background of some of the respondents (street food consumers), the common challenge that almost all the research assistants encountered was that, they had to read and interpret the questions to the respondents for them to respond. This challenge particularly delayed the data collection process since much time was spent on such participants relative to participants who filled the questionnaires themselves. Again, the possibility of losing the real intent of the questions in the course of translation was overcome because prior to the exercise, a mock translation of the questions to the research assistants was organized so that a uniform translations to respondents was assured. Therefore the skill translating the questions to the local dialect remained not a challenge to the research assistants all.

Lastly, some parts of Aboabo, which was a male dominated area, was very scary to administer questionnaire. The people were aggressive and would hardly give consent to participate in the study. The research assistants politely introduced themselves to such people and briefed them of the purpose of the study before some of them gave their consent to participate in the study.

Finally, the study was carried out in three suburbs found in the Kumasi Metropolis. Consequently, the results of this study cannot be generalized to all street food consumers in the other suburbs of Kumasi and by extension Ghana.

3.8. Data Management

The data collected from the field survey was entered, cleaned and analysed using the SPSS (version 20) software programme. The pre-coding of the questionnaire facilitated and eased the data coding process using the SPSS. The data was further generated into frequency tables and charts, which aided in the analysis. The study employed both descriptive and inferential statistical tools in the software (SPSS). The descriptive tool categorized consumers' knowledge and attitude in frequencies and percentages. The inferential statistics, employing the chi-square tool tested the relationship between consumers' socio-demographic characteristics and food safety knowledge. Assessing consumers' knowledge, the participants were given three possible answers- (yes), (no), and '(do not know)'. The 'yes' in the scheme for assessing the respondents was the 'right answer', no meant 'wrong' answer and 'do not know' meant no idea. The food safety attitude section was designed to determine the understanding of consumers about various food safety aspects. Table 3.2 illustrates the objectives of the study and how they were measured and the tools employed in the analysis.

Table 3.2 Measurement scale and analytical tools of the objectives

Objectives	Dependent Variable	Independent Variable	Scale of Measurement	Analytical Tools
To assess consumers' attitude towards food safety in the street food sector.	Consumer's attitude	Food safety of street food	Nominal	Frequencies and percentage
To examine consumers' knowledge regarding food safety in the street food sector	Consumers' knowledge	Food safety of street foods	Nominal	Frequencies and percentage
To find out the relationship between consumers' socio-demographic characteristics and knowledge of food safety	Consumers' food safety knowledge	Sex, age, marital status, level of education, economic status, experience in food safety training and location of respondents	Nominal , (sex, marital status, experience in food safety and location of respondents) Ordinal (age, educational level economic status)	Chi-square (nominal variables and ordinal variables)

Source: researchers' construct, 2015

3.9 Ethical Consideration

Ethics have become a cornerstone for conducting effective and meaningful research.

As such, the ethical behaviour of individual researchers is under unprecedented scrutiny (Best, Edelman, Krieger and Eliason, 2006). This study therefore ensured participants' anonymity, confidentiality, and informed consent.

Invasion of privacy represents a substantial risk in quantitative research because of the sensitive data often collected and analyzed (Baez, 2002). One of the traditional methods of avoiding privacy problems; anonymity, was a way to protect individual

participants. In reporting the results of questionnaire responses, numbers were used to identify individuals.

Respondents were counseled to enable them voluntarily decide whether to participate in the study. The purpose of the study was communicated to the participants to seek their consent. The subjects' physical, emotional, and psychological implications were taken into consideration during the questionnaire filling. Consequently the participants were informed of the usefulness of the study and given the right to decline if he or she deemed fit.

3.10 Validity and Reliability

Validity, according to Adarkwa (2014) refers to the extent to which an instrument measures what it is designed to measure. The researcher made sure that the questionnaires were administered to street food consumers who were 18 years or above in order to guard against fictitious and extraneous data gathered for the study. The researcher's discretion did not affect the respondent's choices of a particular answer in anyway.

With respect to reliability of the data gathered, the right statistical tool (chi-square test) was used to establish the relationship between socio-demographic characteristics and street food consumers' knowledge. Inference was further made based on the statistical reports to ensure consistency and accuracy. To assess consumers' knowledge on street food safety, responses of respondents were rated in frequencies and percentages to identify the highest score and lowest score. The same was applied in assessing consumers' attitude towards food safety of street foods

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the study. It focuses on the presentation, interpretation and analysis of the responses of respondents sampled for the study. The results are presented in sections which correspond with the study's objectives and hypotheses. The first section deals with a presentation of results on the descriptive information of respondents socio-demographic and primary variables (knowledge and attitude of consumers on food safety). The second section presents results of the hypotheses test to determine the relationship between the independent and dependent variables of the study.

4.2 Background Analysis of Data

The sample size for the study was 396 however, after the field survey 394 questionnaires were returned. Out of the, 394 returned, 390 were complete (fully filled) representing a response rate of (98.5%). This response rate gives an indication of the enthusiasm of the respondents to partake in the issue under study. Babbie (2015) emphasized that 50% response rate is adequate.

4.3 Socio-Demographic Characteristics of Respondents

The behavior and perception of people are largely influenced by their socio-demographic background. This statement reinforces the widespread contention of sociological models noted by Mainoo and Kolla (2011) that people emanate from and are influenced by their background. Therefore, the researcher decided to give credence to the socio-demographic characteristics of the respondents. the socio-

demographic variables measured included age, sex, marital status, level of education, economic status, consumers' food safety orientation, and the residential location of respondents.

4.3.1 Sex Distribution of Respondents

The statistics shown in Table 4.1 indicates that 50.7% of respondents were males as against 49.3% of females. This made the study devoid of sex inequality. Therefore, sex of respondents was useful as the study was able to identify the sex balance to make constructive analysis devoid of sex inequality. Moreover, this finding gives credence to the popular perception that males are dominant in street food purchase because most men (male) are not good cooks. This also confirms the emerging trend of women highly patronizing street food because of work demand. The assumption is that they prefer to buy food outside than to spend time cooking (Ampofo, 2001).

Table 4.1: Sex of Respondents

<i>Variables</i>	<i>Frequency</i>	<i>Percent</i>
Male	198	50.7
Female	191	49.3
Total	390	100.0

Source: Field Survey, 2015

4.3.2 Age Distribution of Respondents

Table 4.2 illustrates the data collected from the field and the respondents who participated in the study and responded to issues raised. Statistically, majority of the respondents were between the age range of 26-35 (26%). The least age group constituted respondents who were between the ages of 56-60 (6.3%). Overall, majority of the respondents who participated in the study were mostly young adults who constitute the youth according to Ghana's definition of youth as persons between

the ages 15-30. The age of the respondents helped to differentiate between the different categories of respondents. The study notes that patronizing street food is not a preserve of a certain age category of people but all and sundry irrespective of age can buy food in the street.

Table 4.2: Ages of Respondents

Variables	Frequency	Percent
18-25	100	25.8
26-35	101	26.0
36-45	87	22.2
46-55	77	19.7
56-60	25	6.3
Total	390	100.0

Source: Field Survey, 2015

4.3.3 Marital Status of Respondents

Table 4.3 presents the frequencies and the corresponding percentages of married, single, divorced, and widowed respondents. Out of the 390 total respondents, majority of them were single 144 (37.0%) as against 141 (36.4%) who were married. The study further discovered 83 (21.1%) and 22 (5.5%) participants who were divorced and widowed respectively. Though the single status constituted the majority, the 141 married couples implies that, even married people patronize street food. This contradicts the perception among Ghanaians that wives are expected to cook for their husbands (Ampofo, 2001).

Table 4.3: Marital Status of Respondents

Variables	Frequency	Percent
Married	141	36.4
Single	144	37.0
Divorced	83	21.1
Widow	22	5.5
Total	390	100.0

Source: Field Survey, 2015

4.3.4 Level of Education of Respondents

Table 4.4 on educational attainment of respondents shows that majority of (n=149 (38.4%) were Senior high school graduates. Junior high school graduates followed closely with 119 (30.4%). Respondents with primary school education and illiterates were 72 (18.4%) and 37 (9.5%) respectively. Thirteen (13) of the respondents had attained university education. One's educational level determines how knowledgeable the person is regarding how the person approaches life and issues such as food safety knowledge and attitude. The implication is that consumers with high level of education mostly patronized street food. Accordingly, the few university graduates who patronize street food implies that irrespective of where a person belongs on the social ladder, they can still patronize street food. In other words, street food is not the preserve of a particular class of people.

Table 4.4: Educational Level of Respondents

Variables	Frequency	Percent
Illiterate	37	9.6
Primary School	72	18.4
Junior High School	119	30.4
High School	149	38.4
University	13	3.3
Total	390	100.0

Source: Field Survey, 2015

4.3.5 Respondents' Experience in Food Safety Training

The study sought to identify street food consumers' knowledge and attitudes towards food safety by considering consumers' experience in food safety training. It was prudent to first find out the food safety education and orientation a consumer had had before proceeding to assess the knowledge and attitude of the person on food safety. From Table 4.6, it is clear that majority of the consumers (85.5%) reported that they had had food safety education through formal or informal means. A segment indicated upon further questions that through their upbringing they received such education from their parents while others opined that through formal education they received such orientation. Few 57 (14.5%) however intimated that food safety orientation had not been received. The implication here is that, majority of the respondents had safety knowledge regarding food safety.

Table 4.6: Respondents' Experience of Food Safety Orientation

Variables	Frequency	Percentage
Yes	333	85.5
No	57	14.5
Total	390	100

Source: Field Survey, 2015

4.3.6 Respondents' Residential Area

The figure 4.1 presents the statistics of the respondents by their place of residence. Krofrom which the study selected 160 respondents achieved 158 (42%) while Ayigya had 115 (28%).

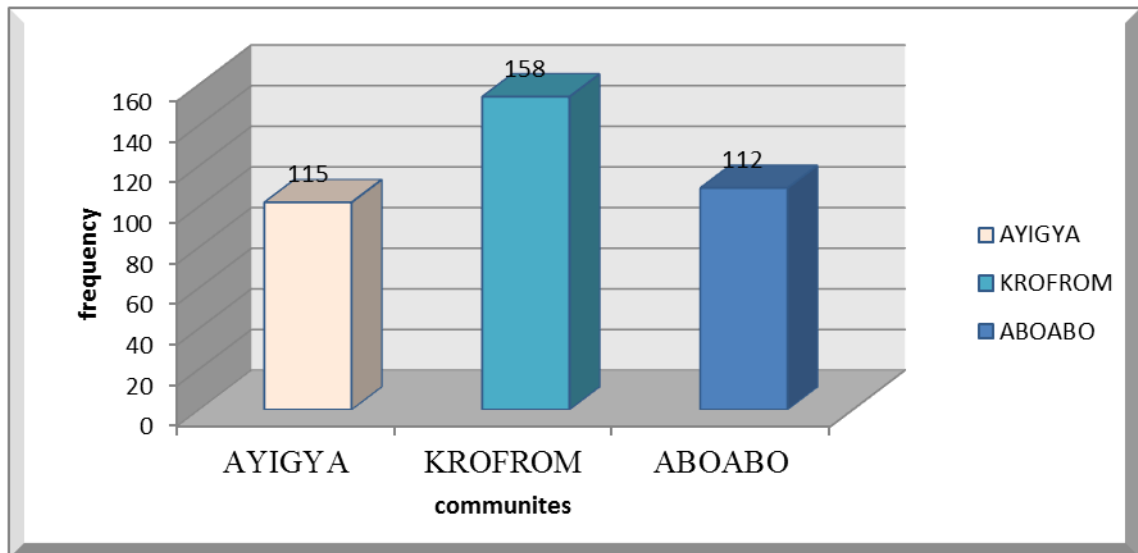


Figure 4.1: Residential Area of Respondents

Source: Field Survey, 2015

4.3.7 The Economic Status of Respondents

The socio-economic status of individuals is perceived to be an important determinant of several life aspects including nutritional status. It also influences accessibility and affordability (Mishra and Singh, 2003). The study explored the economic status of the respondents (street food consumers) to ascertain the possibility of socio-economic status influencing consumer knowledge and attitude in food safety regarding street food. Majority of the respondents were between the middle to upper levels as they earned between 500-1000 Ghana cedis. These respondents accounted for 85 (23.3%) of the total respondents. In sum, 183 (50.1%) respondents were identified as high income earning consumers. This implies street foods patronage is not limited to ‘only the poor or very poor in the society but to the middle and high income earners. With the majority belonging to the higher income category affirmed that street food is not for the poor. This confirms the economic man principle in consumers’ behavior theory, which posits that, a consumer will buy food where he will get his /her money’s worth (Richarme, 2007).

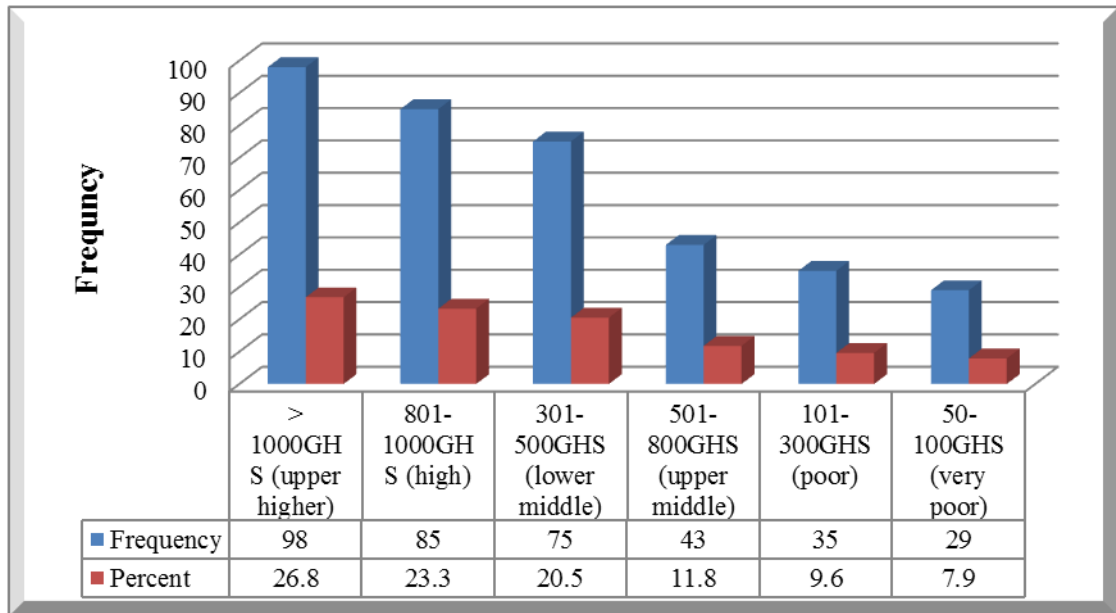


Figure 4.2 Economic Status of Consumers

Source: field survey, 2015

4.4 The Attitude of Consumers towards Food Safety in the Street Food Sector

This study sought to explore consumers' attitude (understanding) of various aspects of food safety in the street food sector. It is documented Rheinlander et al., (2008) that, not enough has been explored on the attitude of consumers towards food safety in the street food sector in the Kumasi Metropolis.

4.4.1 Prevention of Food-Borne Diseases through Proper Hand Hygiene

The study in an attempt to unravel the understanding (attitude) of consumers regarding food safety of street foods, focused on proper hand hygiene as has been acclaimed as food safety indicator and presented to the respondents to indicate; correct, wrong or they do not know of such indicator. Clearly, in Table 4.7 349 (89.6%) respondents indicated that indeed they understand that hand hygiene prevents food borne diseases. However, 34 (8.8%) indicated that hand hygiene is not a food safety attitude while 1.6% (7/360) respondents indicated that they do not know hand

hygiene as a food safety attitude. With the whooping majority getting the question right, it affirms that majority of street food consumers in Kumasi (Krofrom, Ayigya, and Aboabo) understand what it means by hand hygiene.

4.4.2 Avoiding Food Contamination through Proper Storage Attitude

The study in an effort to identify consumers' attitude towards storing cooked and raw foods to reduce the risk of food contamination required consumers to indicate whether raw and cooked foods are best stored separately or together. Majority of 251 (64.4%) intimated that both raw and cooked foods should be stored separately while 121 (31.2%) indicated that storing cooked and raw foods separately is wrong. Apparently, 18 (4.4%) had no idea. The majority of respondents with the opinion that raw food and cooked should be stored separately contradicts Bryan (1988) assertion that food poisoning is dominantly caused by food consumers and handlers' approach of handling food. The study, in view of this can affirm that street food consumers in (Krofrom, Aboabo and Ayigya) have good attitude of storing food.

Table 4.7: Consumers' Attitude towards Street Food Safety

Variables	Correct N (%)	Wrong N (%)	Do not know N (%)
Proper hand hygiene can prevent food borne disease	349(89.6%)	34(8.8%)	7(1.6%)
Raw and cooked foods should be stored separately to reduce the risk of contamination	251(64.4%)	121(31.2%)	18(4.4%)
It is necessary to check the temperature of the fridge periodically to reduce the risk of food contamination	239(61.3%)	84(21.7%)	66(17.0%)
The health status of people should be evaluated before employment	261(67.0%)	111(28.5%)	17(4.4%)
The best way to defrost a chicken is to put it in a bowl of cold water	234(60.1%)	105(27.1%)	51(12.7%)
Dish towels can be a source of food contamination	280(71.9%)	79(20.4%)	30(7.7%)
Knives and cutting boards should be properly sanitized to prevent cross contamination	280(71.8%)	100(25.6%)	10(2.5%)
Food handlers who have abrasions or cuts on their hands should not touch foods without gloves.	272(69.9%)	93(24.0%)	24(6.1%)
Well cooked foods are free from contaminations	254(62.9%)	117(29.9%)	28(7.2%)
Eggs must be washed thoroughly after purchase as soon as possible	244(62.6%)	101(26.0%)	44(11.4%)
The ideal place to store fresh meat is on the bottom shelf of the refrigerator	117(55.4%)	216(30.0%)	57(14.6%)
Defrosted foods can be refrozen	241(62.0%)	102(26.3%)	45(11.7)
Overall Percentage	64.5%	27.0%	8.5%

Source: Field Survey, 2015

4.4.3 Periodic Monitoring of Freezers to Reduce Food Contamination

Periodically monitoring refrigerators/freezers temperatures reduce the risk of food contamination. Majority of the respondents 239 (61.3%) were right in saying that it is necessary to check the temperature of refrigerators to reduce the risk of food contamination. However, 84 (21.7%) addressed this attitude as a wrong approach to reduce the risk of food contamination. It is disturbing to note that 62 (17.0%) had no knowledge of the fact that monitoring freezer's temperatures decreases the risk of contaminating the food. With the whooping majority demonstrating that attitudes toward food storage in freezers is a positive sign that street food consumers in Kumasi (Krofrom, Ayigya, and Aboabo) have positive attitude on food safety of street foods.

4.4.4 Evaluation of Health Status of Workers before Employment

Certain diseases are extremely infectious and identifying them (diseases) before getting in contact with the food is dangerous hence the need to evaluate the health of people given license to operate as food sellers. Premised on this submission, the study inquired from the respondents whether as part of their attitude towards preventing food borne disease, they understand why persons engaged in food sales are evaluated before being allowed to sell food. Significantly, respondents 67.0% (246/390) were right indicating their support for the fact that it is indeed a good attitude to assess a persons' health status in terms of employment. This notion was however refuted by respondents 111 (30.8%), affirming that it is wrong to do that. On the other hand, 18 (4.4%) established that they have no knowledge on the notion.

4.4.5 The Best Way to Defrost a Chicken

As a food safety attitude, consumers or food handler's method of treating frozen chicken has become a household activity since the influx of imported chicken is on the ascendancy. The food safety literature has established that, the best approach to defrost a chicken is to put the chicken in a bowl of cold water to melt before. Significantly, 234 (60.1%) indicated that indeed that is the best attitude towards food safety. However, 105 (27.1%) of the respondents affirmed that, that is not the best approach. Further, 51 (12.7%) displayed their unawareness by indicating that they have no knowledge. The statistics given wholly point to fact that most street food consumers are appreciably aware of food safety attitude as far as treating chicken is concerned.

4.4.6 Consumers' Attitude towards Food Contamination through Kitchen practices

To examine Street food consumers' attitude towards food contamination, respondents for the study were asked to answer questions pertaining to food contamination. According to Ghana Standards Authority available guidelines, dishtowels can be a source of food contamination if not properly sanitized. Similarly, knives and cutting boards should be properly sanitized to prevent cross contamination. Moreover, food handlers who during the food preparation or before have had a cut or abrasions on their hands should not touch foods without gloves. Lastly, Ghana standards Authority (GSA) have advised that food should be well cooked to make them free from contamination. On the premise of the above-mentioned guidelines, (69.1%) of the consumers expressed a positive attitude toward these food safety attitude. However, approximately (25%) of the street food consumers were wrong, expressing that such

guidelines were ineffective. In confirming their ignorance, (5.9%) of the entire respondents did not know that such guidelines given by the Ghana Standards Authority exist. Though the majority of consumers have indicated positive attitudes towards these practices leading to food contamination, the minority need to be educated on these practices since contaminated food can claim several lives as reported in the mass media.

4.4.7 Treatment of Fresh Eggs after Purchase

Eggs are very delicate and depending on the source where it was produced, chances are that they (eggs) might be contaminated in one way or the other. In view of this, food experts advise that eggs must be washed after purchase as soon as possible. Inquiring from street food consumers whether they adhere to this practice, 280 (62.6%) confirmed that it is good attitude towards food safety. However, 100 respondents representing (26%) erroneously remarked that it is wrong to wash fresh eggs as soon as possible. 33 (11.4%) respondents who indicated that they do not know that fresh eggs must be washed after purchase complement this information. This revelation though it is quite commendable; the minorities that are ignorant about this notion must be reached out to, to save lives.

4.4.8 The Ideal Place to Store Raw Meat in the Refrigerator

Food experts advise that raw meat and poultry should be stored in clean and sealed containers on the bottom shelf of the fridge, so that they (raw meat and poultry) cannot touch or drip to contaminate other foodstuffs in the fridge. This question was put before the respondents to indicate whether that practice is; correct, wrong or they do not know. Significantly, majority of 216 (55.4%) averred that the practice is not true. On the contrary, 117 (30.0%) agreed that the ideal place to store raw meat in the

refrigerator is on the bottom shelf. 57 (14.6%) confirmed that they have no idea as far as storing raw meat in refrigerators is concerned. This finding is quite not impressive and must be addressed through public education. Thus, a whopping 275 (76%) respondents demonstrating no knowledge of this practice is quite abysmal since it can lead to death, which is consequential to food poisoning (Djuretic et al., 1996).

4.4.9 Summary of Consumer's Attitude towards Street Foods

The attitude of consumers towards foods safety in the street food sector according to this study is quite appreciable considering the various issues discussed. Consumers' attitude towards preventing contaminated foods overall was encouraging. This is corroborated by 64.94% of the total responses. This reinforces Roberts, Barrett, Howells, Shanklin, Pilling and Brannon, (2008) results that realized an average food safety attitude of 64%. Moreover, in agreement to the current results a similar findings was observed for food safety attitude in a multi-state study carried out in the United States, (Altekruse, et al., 1999) however, a significant ratio (26.28%) of the entire consumers were ignorant of the attitudes to prevent food contamination. Similarly, consumers who had no knowledge on the positive attitude regarding food safety were (8.18%). It can be concluded that there exist the need for mass education for consumers regarding food safety issues. Ignorantly, majority of the respondents indicated that raw meat should not be stored at the bottom shelf of fridges.

4.5 Consumers' Knowledge Regarding Food Safety in the Street Food Sector

The results of the study to identify the food safety knowledge of the consumers are presented in table 4.8. The consumers registered food-safety knowledge score of (60.96%) which is slightly above average (more than 50 percent) indicating that generally, the performance of the entire consumers is quite adequate regarding food

safety knowledge. Nonetheless, (31.89%) of the respondents had insufficient knowledge in food safety (less than 50 percent) while (7.15%) did not know that those measures are actually food safety knowledge. This is symbolic of the fact that the street food consumers in the selected areas (Krofrom, Aboabo and Ayigya) are averagely knowledgeable in food safety. This finding contradicts a study conducted in United Kingdom by Worsfold and Griffith (1997) which reiterates that many consumers are unaware that at least 60% of food poisoning originates in the home, believing that the responsibility lies instead with food manufacturers or restaurants. On the contrary, surveys conducted in 1986 and 1995/1996 expounded that respondents' attitude (understanding) regarding which foods were at high risk from food poisoning, but knowledge about how a food could be made safe to eat was limited (Raab and Woodburn, 1997). This might be disputed since almost two decades have elapsed when this study was carried out. As a result, the strength of this finding potentially could be weakened by time as several educations on food safety awareness through the mass media and other recognized bodies have been embarked on.

Table 4.8 Consumers' Knowledge on Food Safety

Variables	Correct N (%)	Wrong N (%)	Do not know N (%)
Food in swollen cans contain germs	343 (88.2%)	37(9.6%)	10(2.2%)
Food is a potential carrier of bloody diahhoea	283(72.7%)	87(22.5%)	18(4.7%)
It is necessary to take leave from work when suffering infectious disease of the skin	279(71.7%)	96(24.7%)	14(3.6%)
Eating and drinking in the work place increase the risk of food contamination	223(57.3%)	118(30.4%)	48(12.3%)
Hepatitis A virus is a food borne pathogens	215(55.3%)	101(26.0%)	72(18.6%)
Using gloves while handling food reduces the risk of food contamination	234(60.2%)	132(34%)	22(5.7%)
Children, healthy adults, pregnant women and older individuals are at equal risk of food poisoning	249(64.1%)	118(30.4%)	21(5.5%)
Aids can be transmitted by food	163(41.8%)	204(52.5%)	22(5.8%)
Washing hands before work reduces the risk of food contamination	267(68.6%)	100(25.6%)	21(5.8%)
Typhoid fever can be transmitted by food	233(59.9%)	118(30.5%)	37(9.6%)
Food prepared in advance reduces the risk of food contamination	219(56.4%)	138(35.6%)	30(7.9%)
Proper cleaning and sanitization of utensils increase the risk of food contamination	179(46.0%)	195(49.9%)	16(4.1%)
Reheating cooked foods can contribute to food contamination	180(46.4%)	189(48.6%)	19(5.0%)
Washing utensils with detergent leaves them free from contamination	251(64.6%)	113(29.0%)	25(6.4%)
Overall Percentage	61.%	32%	7%

Source: Field Survey, 2015

The discussions of the specific items in the table regarding food safety knowledge follow.

4.5.1 Food Content of Swollen Cans Contain Germs

The food content of swollen cans can be advanced as spoiled foods and therefore contain pathogens that cause food poisoning. According to the United States food and drug administration, Swollen cans often indicate a spoiled product. Pertaining to this study, the consumers were asked whether swollen canned foods are spoiled. A majority of 343 (88.2%) respondents (consumers) indicated that swollen tin implies that the content is spoiled. However, 37 (9.6%) respondents gave erroneous impression that the expression was wrong while 10 (2.2%) admitted that they have no idea about swollen tins food. Generally, the study can make the claim that the majority of street food consumers in Kumasi (Krofrom, Aboabo and Ayigya) are knowledgeable as far as canned foods are concerned though there are quite significant ignorant consumers.

4.5.2 Consumers' Knowledge of Food Borne Diseases

The study sought to find out consumers' awareness of diseases that are food borne. This is caused by consuming contaminated foods or beverages. Foodborne disease produces predominantly gastrointestinal symptoms, including diarrhoea, vomiting, abdominal cramps, and nausea. Some diseases cause fever, disorder, anorexia, and/or headache. Diseases such as bloody diarrhoea, hepatitis A, and typhoid fever, were presented to test the knowledge of the consumers as food borne diseases. Variably, 283 (72.7%) indicated that bloody diarrhoea is a food borne disease as presented on the table. However, 87 (22.5%) identified it as not being food borne disease while 18 (4.7%) responded that they do not have any idea. Hepatitis A, which is relatively a mild form of hepatitis that is caused by a virus and transmitted through contaminated food and water, was presented to the consumers to test their knowledge. Consequently, 215 (55.3%) identified hepatitis A virus as a foodborne disease.

However, 101 (26.0%) respondents reacted to this question wrongly while 72 (18.6%) indicated that they do not know the question. Moreover, typhoid fever, which has been identified as serious and sometimes fatal bacterial infection of the digestive system, caused by eating contaminated food or water was presented to the consumers to test their knowledge. Out of the 390 entire respondents 233 (59.9%) reinforced that typhoid is a food born disease. Nonetheless, 118 (30.5%) indicated never is typhoid fever a food borne disease while 37 (9.6%) intimated that they do not know.

To further test the knowledge of consumers on food borne disease, HIV Aids was presented in the questionnaire as a food borne disease. Surprisingly, 163 (41.8%) were confident that HIV Aids is a food borne disease. Commendably, 204 (52.2%) rightly said under no circumstance could food consumption result in HIV Aids while 22 (5.6%) expressed their ignorance by indicating they do not know the process through which one gets HIV Aids. Concluding on consumers' knowledge on food borne disease, the study can partially make the claim that the street food consumers in Kumasi are knowledgeable in food borne diseases. Majority of the respondents expressing their awareness through the questionnaires authenticates this. Notwithstanding, the minority apparently displaying their ignorance must be educated to adhere to the knowledge that would not make them victims of such circumstances.

4.5.3 Knowledge of Street Food Consumers of Contaminated Foods

How food is contaminated can take several forms. Indiscriminate Eating and drinking in the work place increase the risk of food contamination. Again, washing hands before work reduces the risk of food contamination and food prepared in advance before eating has the tendency to contaminate the food. Respondents who contend that eating and drinking in the work place increase the risk of food contamination

statistically were 223 (57.3%). However, 118 (30.4%) refuted that argument whereas 48 (12.3%) had no idea. Based on the majority response, the study can make a claim that indeed street food consumers in the Kumasi Metropolis are knowledgeable in that respect. On the issue of frequent food handlers using gloves to reduce risk of food contamination, 234 (60.2%) indicated their awareness of this phenomenon whilst 132 (34%) were wrong. Woefully, 22 (5.7%) had no idea in this respect. This finding is inconsistent with Bryan's, (1988) assertion that food poisoning is solely caused by lack of knowledge of food handling of foodstuffs by consumers and vendors. The majority of the consumers intimated great awareness of these foul practices leading to food poisoning so other factors may account for food poisoning and not necessarily the issues considered.

According to the Ghana Standard Authority, food handlers should wear disposable gloves when handling ready-to-eat food. The gloves should be discarded if damaged, soiled, or when interruptions occur in the operation. Both food handlers and consumers to guide against food contamination should adhere to this advice.

Again, the study touched on the knowledge of frequent hand washing before work and its potential reduction in the risk of food contamination. The Ghana Standard Authority has advised that food handlers should wash their hands before commencing work. The rationale behind this knowledge is that pathogens are commonly found on the skin and in the noses of healthy people. Scratching the head and nose can result in bacteria being transferred by hands onto food, which may cause illnesses to customers.

Majority of 249 (68.6%) intimated that they (consumers) have that knowledge and therefore observe food handlers when they buy street food. Conversely, 93 (25.6%) noted that such practice is wrong while 21 (5.8%) expressed no knowledge in this practice. Lastly, to further test the knowledge of consumers on contaminated foods, consumers were required to indicate whether washing utensils with detergents leaves the utensils free from contamination. Interesting finding were recorded as 251 (64.6%) indicated that such practice leaves the utensils from contamination. However, 113 (29%) indicated that such practice thoroughly does not free the utensils from contamination. 25 (6.4%) had no idea. Conventionally, detergent used for cleaning food contacts surfaces should be appropriate for the task, and be able to effectively remove food residues on equipment and utensils (FEHD, 2013).

4.5.4 Knowledge of Consumers about Food Poisoning

The conventional practice according to the (Standards Authority Act, 1973) is that food handlers suffering or suspected of any communicable disease should immediately report the illness or symptoms of illness to the management and seek medical treatment. They should be immediately suspended from engaging in any work that may allow them to be exposed to food, food contact surfaces, food utensils and equipment. The study asked from the respondents to indicate what they perceive as the right practice. Majority of 279 (71.7%) indicated that food handlers suffering from communicable disease should quit and seek for treatment before they return to work. On the contrary, 96 (24.7%) indicated that such practice should not be encouraged. 14 (3.6%) intimated that they have no knowledge on that. This finding permits the conclusion that street food consumers in the Kumasi metropolis are

adequately aware that food handlers suffering from infectious illnesses must leave the work place for treatment.

Answers were sought for questions pertaining to whether children, healthy adults, pregnant women, and older individuals are at equal risk for food poisoning. Impressively, 249 (68.6%) respondents indicated that all those mentioned stands equal chance of being poisoned by food. On the other hand, 118 (30.4%) indicated otherwise, implying not all those mentioned stands equal chance of being poisoned by food. Similarly 22 (5.5%) were with the contention that they have no idea.

Proper cleaning and sanitization of utensils do increase the risk of food contamination. The study proposed this to examine the respondents' view whether they had a fare idea on cleaning and sanitization of utensils. Hundred and seventy nine respondents 179 (46%) confirmed that such activity increases contamination. 195 (49.95) majority doubted this issue and affirmed that such an activity does not increase food contamination but rather enhances food hygiene practices. However 16 (4.1%) indicated no knowledge of this issue.

Reheating cooked foods at a reasonable temperature obviously prevents food borne disease. The study explored the views of consumers in an attempt to examine their food safety knowledge. Impressively, 180 (46%) expressed their knowledge of the fact that you do a lot of harm to food when it is reheated severally. Surprisingly 189 (48.6%) indicated that reheating food does improve the food quality. The majority of the respondents indicating that reheating cooked food is a good practice indicates that street food consumers in Kumasi (Aboabo, Krofrom and Ayigya) are well informed in terms of food hygiene. Nonetheless, 19 (5%) expressed their ignorance indicating that

they do not have any idea as far as reheating of cooked food is concerned. This finding is inconsistent with Worsfold and Griffith (1997).

4.6. Socio-Demographic Characteristics and Knowledge of Food Safety

Evidently, according to Annor and Baiden (2011) the demographic characteristics such as age and gender appear to have no bearing on food safety knowledge of street food consumers. The food and agricultural organization (FAO) in collaboration with Rane contend that numerous studies embarked on to explore the food safety knowledge and attitudes of street food consumers have revealed poor level of food safety knowledge (FAO, 2013, Rane, 2011). However, Soares et al. (2012) have emphasized that, there is positive relationship between food safety knowledge and educational level of street food consumers. In view of the revelations above, one is therefore justified to assert that the relationship pertaining food safety knowledge and demographic characteristics is undefined; thus, there exist divergent conclusions or outcomes. On this premise, this study's effort to establish the relationship between the demographic characteristics and food safety knowledge is explained. Table 4.9 gives the association between the demographic characteristics and food safety knowledge of consumers using the cross tabulation tool in SPSS.

Table 4.9 Chi-Square highlighting the Relationship between Knowledge and Socio-Demographic Characteristics

Variables	Chi-square (X^2)	P-value
Sex	1.400	.237*
Age	11.854	0.18*
Marital status	22.102	.000
Food safety experience	10.63	.001
Level of education	14.613	.006
Economic status	75.004	.000

Source: Field Survey, 2015

$P < 0.05^*$

4.6.1 Relationship between Sex and Knowledge of Food Safety

The table above presents the relationship between the demographic characteristics of respondents and their knowledge in street food safety. There is no relationship between sex and knowledge of food safety as indicated on the table as ($X^2 = 1.400$: $P > 0.05$). This implies that though there is a statistically no significant relationship between the two variables; (sex and knowledge). The p-value of (0.237) further explains that the relationship is not significant since it is greater than the critical value of (0.05) given by the SPSS. This finding is inconsistent with (Muzaffar, Huq, and Mallik, 2009, Soares et al., 2012) finding that, there is a significant relationship between sex (gender) and knowledge of food safety (FS). The null hypothesis of the study is therefore accepted implying that the alternative hypothesis has to be rejected in this analysis. In other words, sex (gender) is independent of food safety knowledge of street foods. Essentially, this implies that whether a person will be knowledgeable in food safety of street foods does not depend on his/her sex (gender).

4.6.2. . Relationship between Marital Status and Food Safety Knowledge

Considering the relationship between marital status and food safety knowledge, it is quite evident ($X^2 = 22.102$) on the table that there is a relationship between the two variables and the relationship is very insignificant ($p < 0.05$). This inferential statistic implies that, a married person is highly certain to have knowledge in food safety. Obviously, the finding on the table presents a very significant relationship between the two variables.

Relating this interpretation to food safety knowledge of street food consumers, it could be emphasized that consumers' knowledge of food safety has significant relationship with the person's marital status. This finding is in accord with (Mahon, Sobel, Townes, Mendoza, and Tauxe, 1999, Annor and Baiden 2011) argument that marital status and location have bearing on food safety knowledge of consumers. This permits the studies to, as it were, reject the null hypothesis, as there is statistically significant relationship between the two variables. The alternative hypothesis is therefore accepted to make a case that food safety knowledge of street food consumers is not independent of marital status..

4.6.3. Relationship between Location of Respondents and Food Safety Knowledge

The study explored the various destinations (study areas) of the respondents to identify the sort of relationship it has with food safety knowledge. The test ($X^2 = 34.12$) indicated an association between the two variables. This implies that the relationship that exists between the two variables is significant. Consequently, the relationship is significant at ($P < 0.000$). In a study conducted by Samapundo et al. (2014), in four communities in Haiti, he perceived a significant relationship between

food safety knowledge of consumers based on their location ($P < 0.000$). He argued that consumers from high-class communities relatively have higher knowledge in food safety. This consents to the finding of this study, which asserts that a change or move from one community affects food safety knowledge. Theo van, (2000) affirms this assertion.

4.6.4 Relationship between Experience of Food Safety Training and Knowledge

The study sought to explore in-depth whether a consumer who has acquired food safety orientation be it formal or informal is well knowledgeable in food safety. The Chi-square test of independence conducted to determine the relationship between experience of food safety training and knowledge revealed a statistically significant relationship between the variables of ($X^2 = 10.63$). Implying, a consumers' level of knowledge is not independent of food safety orientation acquired by that person. A significant value of (0.000) indicates that the relationship between the two variables is significant. The revelation of this relationship between the variables confirms (Wilcock et al., 2004) submission. Wilcock et al., (2004) posit that, the reduced interest towards food safety in the third world countries is due to a lack of consumer education and training. However, (Kalua, 2001, Jevsnik et al., 2008) dispute this finding as they affirm that, a consumers' food safety training has no significant effect on the level of food safety knowledge. On the premise of this finding, a claim can be made that food safety training is not independent of food safety knowledge rejection of the null hypothesis is therefore justified.

4.6.5 Relationship between Age and Food Safety Knowledge

Considering the relationship between knowledge of food safety and age of respondents, it is evident on table 4.10 that ($X^2 = 11.854$) there is a relationship between the two variables (age and knowledge of food safety). However, with the significant value of ($P = 0.018$), the implication is that the association is not significant. Essentially, what this statistic expounds is that whether one will be knowledgeable in street food safety in one way or the other does not depend on the age of the person. The study therefore can affirm that there is a statistically no significant relationship between knowledge and age of consumers as far as street food is concerned. This finding contradicts with Anderson, Verrill and Sahyoun (2011) argument that, older, married and higher income respondents are more knowledgeable in food safety rules. Annor and Baiden (2011), also affirm that age and knowledge are associative.

4.6.6 Economic Status and Respondents' Food Safety Knowledge

To establish the link between economic status of respondents and knowledge of street food safety, the study examined economic status (level of income) of the respondents. Since the variable (economic status), was measured using the ordinal scale, the statistical tool appropriate such an analysis was the cross tabulation tool in SPSS. The study realized a positive association between economic status and knowledge of food safety ($X^2 = .75.044$; $P < 0.00$). The chi-square test result indicates that there is a significant relationship between consumers' economic status and food safety. Consumer behavior theory by Stewart, (1994) is applicable here. The theory posits that the individual decision to buy is motivated by series of internal and external dispositions. The theory in expatiating the economic man principle adduce that the

consumer will buy food where he will get his money's worth. In other words, the consumer seeks to optimize satisfaction while reducing cost. This is consistent with the theory of consumer behavior as the study finds a positive association between consumers' economic status and food safety knowledge.

4.6.7 Relationship between Level of Education and Food Safety Knowledge

The relationship between two variables in this study- a consumer's level of education and food safety knowledge is identified in table 4.10 as ($X^2= 14.613$) and ($P < 0.006$). These statistics connote that there is a statistically significant relationship between the two variables (level of education and food safety knowledge). This implies that consumers' level of education is not independent of food safety knowledge. The P-value of (0.006) indicates a significant relationship between the variables and the X^2 value of (14.613) explains a relationship between the variables. This result confirms the study of Bas et al., (2006) who found that level of education and location significantly relates to consumers' knowledge of food safety. In addition, a study by Altekruze et al. (1999), intimated that consumers who at least have acquired basic education demonstrated higher sense of food safety knowledge. Sanlier (2010), also found an association between educational level and knowledge of food safety. In addition, (Levy, 1996, Osaili, Bayan Obeidat, Dima and Hiba, 2010) in their respective study emphasized that, people who have had more than 12 years of education are more knowledgeable in food safety. On the contrary, authors such as Rheinlander et al., (2008); Annor and Baiden, (2011) in a study conducted in Ghana identified education to have no bearing on the food safety knowledge and attitudes of consumers. From the preceding analysis, it is justifiable to assert that the relationship between level of education and food safety knowledge is significant.

In conclusion, the result of the study is imperative, as the World Health Organization (WHO) has hinted that food supply has become increasingly globalized and for that matter, there is the need to strengthen food systems in and between countries (WHO, 2015). It is therefore not out of place to examine street food consumers' knowledge and attitude towards food safety. Food borne disease and its consequent deaths have been a problem in the world particularly the third world countries including Ghana. The study confirms that there is a significant relationship between food safety training and food safety knowledge.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter is organized into three segments. The first segment summarizes the major findings realized from the data analysis in relation with the research objectives. The summary is presented in the same sequence as the objectives listed in chapter one. The next segment focuses on the conclusion of the study and the final segment presents recommendations based on the findings of this research.

5.2 Summary of Major Findings

This research set out to assess the knowledge and attitude of consumers regarding safety of street food. The relationship between consumers' socio-demographic characteristics and knowledge of street food safety was also explored.

With regards to the socio-demographic characteristics of residents sampled for the study, it was revealed that more males than females availed themselves for the purpose of the study. It was also discovered that the population of (krofrom, aboabo and ayigya) was dominantly youthful in nature and thus constitute the active labour force of the study area. Additionally, as revealed by the study, most respondents were prominently senior high school graduates. A high percentage of respondents were found to be single. In terms of the economic status, the study discovered that respondents who received more than one thousand cedis (¢1000) were the majority. Furthermore, it was revealed that, a significant number of respondents had food safety experience. All the three sampling units were represented proportionally by their respective respondents.

Food Safety Attitude of Consumers

The results of the study in relation to the attitude (understanding) of consumers regarding various aspects of food safety revealed that consumers' understanding of hand washing (hand hygiene) in the selected areas is appreciable. Additionally, the study discovered through the sampled respondents that both raw and cooked foods should be stored separately to prevent food contamination.

Further, respondents indicated that periodically monitoring refrigerators/freezers temperature reduces the risk of food contamination. The study also discovered that certain diseases are extremely infectious and identifying them (diseases) before food handlers getting in contact with the food is dangerous hence the need to evaluate the health of people given license to operate as food sellers.

The study also revealed that, the best approach to defrost a chicken is to put the chicken in a bowl of cold water to melt before one can use it to prepare any meal. The study identified that through bad kitchen practices, food can be contaminated.

Furthermore, the study identified through the sampled respondents that fresh eggs should be washed properly after purchase to avoid food contamination. Finally, the study disclosed that the best approach to store raw meat in a fridge is not to put it in the bottom shelve of the freezer which contradicted the accepted process. Despite the insights unraveled, there were notable revelations which needed pragmatic approaches to impart food safety attitude. For instance, a considerable number of respondents expressed wrong attitude to food contamination indicators, best kitchen practices and evaluation of health status of workers before employment.

Food Safety Knowledge of Consumers

The second objective of the study sought to explore in depth consumers' knowledge (awareness) regarding food safety issues. The study revealed that consumers were adequately aware of the fact that food content in swollen can(s) contain germs and therefore are highly contaminated.

The study in addition revealed that consumers were aware of food borne diseases.. Furthermore, the study disclosed that consumers were highly aware that indiscriminate eating and drinking in the work place increase the risk of food contamination.

Again, washing hands before cooking was found to reduce the risk of food contamination and food prepared in advance before eating had the tendency of being contaminated. The study found that consumers were aware that food handlers should wear disposable gloves when handling ready-to-eat food.

Finally, the study identified that consumers were aware that food handlers suffering or suspected of any communicable disease should immediately report the illness or symptoms of illness to the management and seek medical treatment. They should be immediately suspended from engaging in any work that may expose them to food, food contact surfaces, food utensils and utensils.

The last objective of the study examined the relationship between socio demographic characteristics of the sampled respondents (consumers) and food safety knowledge. The study in this context used respondents' sex, age, educational level, food safety experience and community of residence as the socio demographic characteristics and employed both chi-square tool for the inferential analysis.

Employing the chi-square test of independence for the categorical variables (sex, marital status, experience and location of respondents) , the test results revealed that, with the exception of sex ($P > 0.05$) there was significant relationship between the other variables ($P < 0.05$) and food safety knowledge (awareness). Again, the ordinal variables (age, economic status and level of education) as against the nominal variable (food safety knowledge) in cross tabulation analyse revealed a significant relationship between the ordinal variables and nominal variable with the exception of age. Therefore, the alternative hypothesis that there is a significant relationship between socio-demographic characteristics and food safety knowledge is supported while the null hypothesis is not.

5.3 Conclusion

The study on the premise of the above findings advances the following conclusions.

5.3.1 Respondents' Socio-Demographic Characteristics

It is evident from the study that males dominantly patronize street food. This confirms the public perception that males do not cook in the house, they always buy from outside. Bothering on age, the study concludes that consumers within the age group of (18-25) dominate street food consumption. The study explored the marital status of respondents and the conclusion that is drawn on the finding is that singles (who are not married) patronize street food more than the other categories of marital status.

Economically, this study affirms that consumers with high economic status patronize street food. The popular perception has always remained that people on high economic ladder are very choosy in terms of where to eat but the study has revealed that irrespective of how a person is endowed economically, they still patronize street

food. Finally, through formal or informal means, consumers have acquired food safety orientation from either school or home.

5.3.2 Consumers' Attitude towards Food Safety

Clearly, the food safety attitude of street food consumers was explored and the following conclusions are advanced.

The study confirms that raw and cooked foods should be stored separately to reduce the risk of food contamination. Consumers' attitude according to this study is positive hence the study concludes on this premise that consumers attitude towards food safety is positive. Practically, the temperature of refrigerators periodically should be checked to avoid food contamination. Consumers have good attitude in respect with this practice. The study identified that consumers are aware hepatitis A virus is a food-borne pathogen. By this, the study put forward that consumers attitude towards virus-causing food poison is positive. The study also concludes that consumers have positive attitude towards how chicken is defrosted. The conclusion made here is that consumers of street food to some extent have good attitudes towards food safety.

The study also notes that consumers' attitude towards food storage is bad. Authoritatively, the study can make the claim that the ideal place to store raw meat in the refrigerator is on the bottom shelf. Shockingly, consumers however declined this attitude as the ideal practice. The conclusion made here is that consumers attitude towards storage of raw meat is poor. Storing meat in any part of the fridge apart from the bottom shelf implies that if there is power outage, the liquid that will melt from the meat will drift to contaminate other foodstuffs in the fridge.

5.3.3 Consumers' Knowledge on Food Safety

Findings of prime interest pertaining consumers' knowledge are that Street food consumers encountered difficulties in distinguishing persons susceptible to food poisoning. Drawing from this, the study concludes that majority of street food consumers are not knowledgeable to comprehend who is susceptible to food poisoning. Also, quite a considerable number of respondents disclosed that HIV aids is a food borne disease.

Furthermore, the study concludes that consumers are knowledgeable of the fact that indiscriminate eating and drinking in the work place increase the risk of food contamination. Furthermore, consumers are aware that food content in swollen tins contains germs. This confirms the fact that street food consumers in the study area (Krofrom, Ayigya and Aboabo) are aware of canned foods considered poisonous. It is necessary to check the temperature of the fridge periodically to reduce the risk of food contamination. The study concludes that consumers' knowledge on this practice is very fair. The study put forward that street food consumers of (Krofrom, Ayigya and Aboabo) are knowledgeable in this regard.

5.3.4 Socio-Demographic Characteristics and Food Safety Knowledge

The relationship between consumers' socio-demographic characteristics and knowledge of food safety was explored. The study concludes that there is no significant association between sex and knowledge. Again, on the relationship between food safety knowledge and age, the study concludes that there is no significant association between the two variables. This implies that food safety knowledge is independent of age.

On the relationship between marital status and food safety knowledge, the study concludes that consumers' knowledge of food safety on street foods significantly relates to their marital status. Premised on the study's findings, conclusion is drawn on the fact that, a consumer's level of education has a bearing on his/her food safety knowledge.

Essentially, the study concludes there is a significant association between food safety orientation be it formal or informal and knowledge in food safety. The test result revealed a significant relationship ($P < 0.000$) implying that knowledge of a consumer is associated with food safety orientation acquired by the consumer. This finding therefore lends support to the rejection of the null hypothesis, which assumed that there is no relationship between consumers' socio-demographic characteristics and their knowledge of food safety.

Lastly, the study notes that the relationship that exists between location of respondent and knowledge of food safety has a significant relationship. Thus, as a consumer changes residence, there is the likelihood that their knowledge of food safety orientation could also change.

5.3.5 Hypothesis Results

The chi-square test of independence results revealed a significant relationship between street food consumers' socio-demographic characteristics and food safety knowledge. The research hypothesis of the study which predicted a significant relationship between the two variables is therefore supported.

5.4 Recommendations

Drawing from the findings and discussion of the study the following recommendations are suggested.

5.4.1 Recommendation to the Government

The study found out that a consumer who has food safety training is well versed in food safety knowledge. This therefore becomes incumbent on the government to intensify the established programs aimed at educating consumers on food safety, since improving the health of the citizenry will strengthen the human resource and in turn increase productivity. Extensively, the education should be broadened to enlighten consumers who believe Aids is a food borne disease.

5.4.2 Recommendation to Street Food Consumers and Vendors

As part of the findings, some consumers indicated that raw meat should be stored in the deep freezer of the refrigerator irrespective of where the shelf is positioned in the fridge. The conventional practice is that raw meat is supposed to be in the bottom shelf of the fridge to avoid liquid drifting from the meat to contaminate the other foods in the fridge. Consumers are therefore recommended to take advantage of the education from the mass media (Television, print media and radio) and organized institutions to acquire food safety knowledge and attitudes to help them in their daily lives.

In addition, since the study found statistically significant association between knowledge of street food consumers and socio-demographic statistics, the study recommends that, particularly with education, consumers should advance in education so that they can increase their knowledge in food safety. This is because, at a point in

every person's lifetime, the situation will present itself for a person to patronize street food willingly or unwillingly. So having the knowledge regarding food safety will guard against food poisoning and its consequent effect, death.

5.4.3 Recommendation to Institutions

Institutions like Consumer International (CI) should intensify education of street food consumers on food safety especially on the need to know where to store raw meat in fridges, practice hand hygiene and sanitize knives and cutting boards.

5.4.4 Recommendation for Further Research

The results of this study validate previous studies which conclude a positive relationship between food safety training and food safety knowledge. Future research should expand the scope to examine broadly the food safety knowledge in the entire metropolitan suburbs in Kumasi.

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APPENDIX A

QUESTIONNAIRE FOR STREET FOOD CONSUMERS

Good Morning/Afternoon,

I am with the Kwame Nkrumah University of Science and technology (graduate school), Kumasi. My name is Acheampong Frank. I am talking to several people like you to ascertain your views on **‘consumers’ knowledge and attitude towards food safety in the street food sector.**

Your opinions are very important and they will help us to improve upon food safety among consumers in Kumasi and Ghana in general. There is no right or wrong answer. Your response is valuable. In this exercise, you will be required to respond to some questions about the subject matter at your own convenience. Be guided that your refusal to answer any of these questions will not affect your status in any way because your responses will be treated with utmost confidentiality. You are free to participate or not. However, I encourage you to help me so we can together improve food safety in Ghana. THANK YOU

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. **Sex** a. male [] b. female []
2. **Age (years)** a. below 18 b.18-25 [] c. 26-35 [] d. 36-45 e. 46-55 [] f. 56-60 [] g. > 60 []
3. **Marital status** a. Married [] b. Single [] c. Divorced [] d. Widow []
4. **Level of Education:** a. Illiterate [] b. Primary School [] c. Junior High School [] d. Senior High School [] e. University []
5. **Have you had food safety orientation?** a. Yes [] b. No []
6. **Income Status** (a) 50-100GH¢ (b) 101-300GH¢ (c) 301-500GH¢ (d) 501-800GH¢ (e) 801-1000GH¢ (f) > 1000GHS¢
7. **Location of Respondents** a. Ayigya [] b. Krofrom [] c. Aboabo []

SECTION B
ASSESSMENT OF FOOD SAFETY KNOWLEDGE OF STREET FOOD CONSUMERS

Respondents are to tick (✓) to indicate whether the under listed questions is indeed true using the scale: (1=Yes 2=No 3= Do Not Know). Please

Question	Yes (1)	No (2)	Do not know (3)
1. Swollen cans contain germs			
2. Bloody diarrhoea can be transmitted by food			
3. It is necessary to take leave from work when suffering infectious disease of the skin			
4. Eating and drinking in the work place increase the risk of food contamination			
5. Hepatitis A virus is a food-borne pathogens			
6. Using gloves while handling food reduces the risk of food contamination			
7. Children, healthy adults, pregnant women and older individuals are at equal risk for food poisoning			
8. Aids can be transmitted by food			
9. Washing hands before work reduces the risk of food contamination			
10. Typhoid fever can be transmitted by food			
11. Food prepared in advance reduces the risk of food contamination			
12. Proper cleaning and sanitization of utensils increase the risk of food contamination			
13. Reheating cooked foods can contribute to food contamination			
14. Washing utensils with detergent leaves them free from contamination			

SECTION C

ASSESSMENT OF FOOD SAFETY ATTITUDES OF STREET FOOD CONSUMERS

Respondents are required to tick (✓) to indicate whether the under listed statement indeed true using the scale: (1=Yes, 2=No 3= Do Not Know)

Questions	Yes (1)	No (2)	Do not know (3)
1. Proper hand hygiene can prevent food-borne diseases			
2. Raw and cooked foods should be stored separately to reduce the risk of food contamination			
3. It is necessary to check the temperature of refrigerators/freezers periodically to reduce the risk of food contamination			
4. The health status of workers should be evaluated before employment			
5. The best way to defrost a chicken is to put the chicken in a bowl of cold water			
6. Wearing masks is an important practice to reduce the risk of food contamination			
7. Dish towels can be a source of food contamination			
8. Knives and cutting boards should be properly sanitized to prevent cross contamination			
9. Food handlers who have abrasions or cuts on their hands should not touch foods without gloves			
10. Well-cooked foods are free of contamination			
11. Eggs must be washed after purchase as soon as possible			
12. The ideal place to store raw meat in the refrigerator is on the bottom shelf			
13. Defrosted foods can be refrozen			

Thanks for participating

APPENDIX B

Chi-Square Test

Sex *knowledge Cross tabulation

		knowledge		Total	
		Yes	No		
SEX	MALE	Count	140	45	185
		Expected Count	134.8	50.2	185.0
		% within SEX	75.7%	24.3%	100.0%
SEX	FEMALE	Count	126	54	180
		Expected Count	131.2	48.8	180.0
		% within SEX	70.0%	30.0%	100.0%
Total		Count	266	99	365
		Expected Count	266.0	99.0	365.0
		% within SEX	72.9%	27.1%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.400 ^a	1	.237
Continuity Correction ^b	1.182	1	.277
Likelihood Ratio	1.401	1	.237
Fisher's Exact Test			
Linear-by-Linear Association	1.397	1	.237
N of Valid Cases	509		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 77.85.

b. Computed only for a 2x2 table

Crosstab Of Age And Knowledge Of Street Food

		AGE (YEARS)					Total	
		18-25	26-35	36-45	46-55	56-60		
KNOWLEDGE	Yes	Count	59	75	71	58	18	281
		Expected Count	69.5	74.2	63.2	56.2	18.0	281.0
		% within KNOWLEDGE	21.0%	26.7%	25.3%	20.6%	6.4%	100.0%
KNOWLEDGE	No	Count	30	20	10	14	5	79
		Expected Count	19.5	20.8	17.8	15.8	5.0	79.0
		% within KNOWLEDGE	38.0%	25.3%	12.7%	17.7%	6.3%	100.0%
Total		Count	89	95	81	72	23	360
		Expected Count	89.0	95.0	81.0	72.0	23.0	360.0
		% within KNOWLEDGE	24.7%	26.4%	22.5%	20.0%	6.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.854 ^a	4	.018
Likelihood Ratio	11.758	4	.019
Linear-by-Linear Association	5.133	1	.023
N of Valid Cases	360		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.05.

b.

Crosstab between level of education and food safety knowledge

			KNOWLEDGE		Total
			Yes	No	
LEVEL OF EDUCATION	ILLITERATE	Count	27	8	35
		Expected Count	27.3	7.7	35.0
		% within LEVEL OF EDUCATION	77.1%	22.9%	100.0%
	PRIMARY SCHOOL	Count	53	13	66
		Expected Count	51.5	14.5	66.0
		% within LEVEL OF EDUCATION	80.3%	19.7%	100.0%
	JUNIOR HIGH SCHOOL	Count	77	29	106
		Expected Count	82.7	23.3	106.0
		% within LEVEL OF EDUCATION	72.6%	27.4%	100.0%
	HIGH SCHOOL	Count	119	22	141
		Expected Count	110.1	30.9	141.0
		% within LEVEL OF EDUCATION	84.4%	15.6%	100.0%
	UNIVERSITY	Count	5	7	12
		Expected Count	9.4	2.6	12.0
		% within LEVEL OF EDUCATION	41.7%	58.3%	100.0%
	Total	Count	281	79	360
		Expected Count	281.0	79.0	360.0
		% within LEVEL OF EDUCATION	78.1%	21.9%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.613 ^a	4	.006
Likelihood Ratio	12.930	4	.012
Linear-by-Linear Association	.006	1	.938
N of Valid Cases	360		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 2.63.

Food safety knowledge cross tabulates economic status

			KNOWLEDGE		Total
			Yes	No	
ECONOMIC STATUS	50-100GHS	Count	15	12	27
		Expected Count	21.1	5.9	27.0
		% within ECONOMIC STATUS	55.6%	44.4%	100.0%
	101-300GHS	Count	26	7	33
		Expected Count	25.8	7.2	33.0
		% within ECONOMIC STATUS	78.8%	21.2%	100.0%
	301-500HS	Count	59	16	75
		Expected Count	58.5	16.5	75.0
		% within ECONOMIC STATUS	78.7%	21.3%	100.0%
	501-800GHS	Count	43	0	43
		Expected Count	33.6	9.4	43.0
		% within ECONOMIC STATUS	100.0%	0.0%	100.0%
	801-1000GHS	Count	85	0	85
		Expected Count	66.3	18.7	85.0
		% within ECONOMIC STATUS	100.0%	0.0%	100.0%
	> 1000GHS	Count	53	44	97
		Expected Count	75.7	21.3	97.0
		% within ECONOMIC STATUS	54.6%	45.4%	100.0%
	Total	Count	281	79	360
		Expected Count	281.0	79.0	360.0
		% within ECONOMIC STATUS	78.1%	21.9%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.044 ^a	5	.000
Likelihood Ratio	96.280	5	.000
Linear-by-Linear Association	.574	1	.449
N of Valid Cases	360		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.93.

Marital Status * Knowledge on Food Safety

		knowledge		Total
		Yes	No	
MARITAL STATUS	Count	107	26	133
	MARRIED Expected Count	96.9	36.1	133.0
	% within MARITAL STATUS	80.5%	19.5%	100.0%
	Count	84	51	135
	SINGLE Expected Count	98.4	36.6	135.0
	% within MARITAL STATUS	62.2%	37.8%	100.0%
	Count	60	17	77
	DIVORCED Expected Count	56.1	20.9	77.0
	% within MARITAL STATUS	77.9%	22.1%	100.0%
	Count	15	5	20
	WIDOW Expected Count	14.6	5.4	20.0
	% within MARITAL STATUS	75.0%	25.0%	100.0%
Total	Count	266	99	365
	Expected Count	266.0	99.0	365.0
	% within MARITAL STATUS	72.9%	27.1%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.102 ^a	3	.000
Likelihood Ratio	22.301	3	.000
Linear-by-Linear Association	2.507	1	.113
N of Valid Cases	365		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.32.

Experience in Food Safety Training * Knowledge

		knowledge		Total
		Yes	No	
EXPERIENCE IN FOOD SAFETY TRAINING	Count	236	76	312
	Expected Count	227.1	84.9	312.0
	YES % within EXPERIENCE IN FOOD SAFETY TRAINING	75.6%	24.4%	100.0%
	Count	29	23	52
	Expected Count	37.9	14.1	52.0
	NO % within EXPERIENCE IN FOOD SAFETY TRAINING	55.8%	44.2%	100.0%
Total	Count	265	99	364
	Expected Count	265.0	99.0	364.0
	% within EXPERIENCE IN FOOD SAFETY TRAINING	72.8%	27.2%	100.0%

Chi-square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.633 ^a	1	.001
Continuity Correction ^b	9.676	1	.002
Likelihood Ratio	10.729	1	.001
Fisher's Exact Test			
Linear-by-Linear Association	10.604	1	.001
N of Valid Cases	364		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 24.14

b. Computed only for a 2x2 table

Location of Respondent * knowledge

		knowledge		Total	
		Yes	No		
LOCATION OF RESPONDENT	AYIGYA	Count	63	39	102
		Expected Count	74.3	27.7	102.0
		% within LOCATION OF RESPONDENT	61.8%	38.2%	100.0%
	KROFROM	Count	128	37	165
		Expected Count	120.2	44.8	165.0
		% within LOCATION OF RESPONDENT	77.6%	22.4%	100.0%
	ABOABO	Count	75	23	98
		Expected Count	71.4	26.6	98.0
		% within LOCATION OF RESPONDENT	76.5%	23.5%	100.0%
Total	Count	266	99	365	
	Expected Count	266.0	99.0	365.0	
	% within LOCATION OF RESPONDENT	72.9%	27.1%	100.0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.118 ^a	2	.000
Likelihood Ratio	34.754	2	.000
Linear-by-Linear Association	17.016	1	.000
N of Valid Cases	365		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 45.64