SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA, LEGON

FACTORS ASSOCIATED WITH FOOD SAFETY PRACTICES AMONG RAW MEAT HANDLERS IN TURAKU SLAUGHTER SLAB AND MADINA MARKET IN ACCRA, GHANA

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE AWARD OF MASTER OF PUBLIC HEALTH

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DECLARATION

I, Jennifer Naa Oyoe Quartey hereby declare that except for the references which have been duly cited, the entire work in this proposal is by my effort and has never been presented either in whole or in part for any other degree in this University or elsewhere.

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ACADEMIC SUPERVISOR

DEDICATION

I dedicate this book to the Almighty God for the health and strength He's provided me and for seeing me through this project successfully. I also dedicate this book to my loving father, Mr. John Quartey for your fervent prayer and immeasurable support.

ACKNOWLEDGEMENT

The Lord Almighty deserves the biggest appreciation as far as this dissertation is concerned. I am grateful to Him for the life, wisdom and strength He gave me to accomplish this work. This dissertation would not have been a success without the immense contribution from my supervisor, Prof. Isabella Quakyi. I sincerely express my profound gratitude to her for the wonderful guidance offered throughout the entire period of my work. May the good Lord bless you.

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LIST OF ABBREVIATIONS

HACCP	-	Hazard Analysis Critical Control Point
FAO	-	Food and Agriculture Organization
FDB's	-	Foodborne Diseases
FSH	-	Food Safety and Hygiene
FS	-	Food Safety
GHS	–	Ghana Health Service
MH	-	Meat Handler
WHO	-	World Health Organization

DEFINITION OF TERMS

Meat handler: An individual who works with meat and has direct contact with the raw meat.

Food handler: A person who works food- packaged or unpackaged, or one who comes into contact with food surfaces for a food service establishment.

Food safety: A scientific discipline describing the handling, preparation and storage of foods in ways that can avert foodborne illness.

Food hygiene: The action taken to ensure that food is handled, stored, prepared and served under hygienic conditions, as to prevent as far as possible the contamination of food.

Personal hygiene: Practices involved in taking care of one's self and leading a healthy lifestyle.

Hygienic practices: A set of practices performed for the preservation of health.

Food- borne diseases: The consequences of the consumption of contaminated foodstuffs.

ABSTRACT

BACKGROUND: Food is susceptible to contamination taking the food chain into consideration. In Ghana, food products are mostly purchased in an open market where people can display their bargaining skills therefore meat and other animal products are hardly bought from well designed and state-of-the-art outlet. Meat is improperly handled and is exposed to all forms of hazards which may pose health threat to the consumer. Food safety practices is of great concern to public health.

OBJECTIVES: This study seeks to assess the knowledge on food safety practices among raw meat handlers, assess the practices on food safety among raw meat handlers and to determine the relationship between knowledge and practice among the study groups.

METHODS: A descriptive cross-sectional method and a population census was used for this study. 200 slaughter house workers and butchery workers were used. A structured questionnaire was used to collect data and analysed using STATA 15.0 version software.

RESULTS: Knowledge of food safety among raw meat handlers was 3% with a p-value of 0.352. Among the factors associated with food safety practices, personal hygiene practices ($p<0.001$), age (31 – 45 years; $p=0.014$), those with education (secondary level of education; $p=0.002$), owners of a meat shop ($p= 0.015$) and working experience (10 years and above $p<0.001$) were shown to be significant.

CONCLUSION: Environmental health officers in both municipalities should organize food safety training and educate raw meat handlers on the importance of food safety and its consequences.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Food related illnesses are a public health concern globally and a major effect of low economy (Kagambega *et al*., 2011). Diseases associated with food have led to substantial ill health and death globally. According to World Health Organization (WHO), "18% of children aged below 5 years old in developing countries die due to diarrhea globally" (Abdul-Mutalib *et al*., 2012). Foods from animal origin are most commonly involved in disease outbreaks especially poultry, pork, beef, milk, fish and eggs (Kioko, 2012). There has been an increased awareness of meat safety due to the increasing and severity of food poisoning outbreaks worldwide (McDonald & Sun, 1999). A percentage of people in developed countries are affected by foodborne illnesses each year and the burden is going to be even worse in Low and Middle Income Countries (WHO, 2002). Mead *et al*., (1999) reported that, "in the USA, foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year". According to literature, in some Low and Middle Income Countries, where there is low economic growth and low educational levels, there is deficits in awareness of food safety and hygiene, meaning foodborne illnesses are an obstinate burden. The major means for transferring foodborne pathogenic micro-organisms to humans is the ingestion of contaminated raw meat and meat products (Kagambega, *et al*., 2011). A reviewed literature by Kagambega, *et al.,* (2011), stated that the microbial load on a freshly slaughtered animal may be relatively few compared to the meat surface exposed to other processes after slaughtering. Conveying meat from one place to another and exposure during selling operations can also result in contamination. The microbiology of foodborne diseases are a matter of crucial public health concern

(Soyiri *et* al., 2008). Small to medium sized food processing facilities face challenges in effective execution of any food safety system. In most instances, these group of people are susceptible to contamination, especially when there is no knowledge on good work practices. (Smigic *et al*., 2016). However, it has been difficult setting up and executing suitable actions for livestock and consumer health protection in developing countries (Kioko, 2012). The most preventable manner of pathogenic transmission from meal handlers to the final purchaser is by means of the practice of top hygiene, both private and in the course of food handling practices. It has been repeatedly suggested that meat handlers' mistakes which ended in outbreaks, had been meals dealt with by means of an infected man or woman or through someone carrying a foodborne pathogen on a bare hand contact with meals, fallacious washing of fingers and inadequate cleansing of working equipment (Smigic *et al.,* 2016). Food service facilities with apt hygienic standards is essential for promoting and protecting health, and the one without is responsible for the frequency of foodborne disease outbreak (Campos *et al*., 2009). "The risk of transmission of pathogenic bacteria and foodborne diseases to consumers will be minimized when meat contamination is reduced" (Kagambega *et al*., 2011).

1.2 Statement of the problem

Foodborne illnesses are of importance taking into consideration meat and meat products (Ansari-Lari *et al*., 2010). These products are less expensive when it's out for sale on the open market. Animal products are a delicacy for the urban population. Bearing in mind the high perishability of meat, it equally demands a level of training and acquisition of knowledge by meat handlers (MH) in meat industries to ensure consumer health protection (Jianu & Goleţ, 2014). Soyiri *et al.* (2008) reported a "morbidity data on food related cases on diarrhea (331,998), typhoid fever (65,333) and cholera (2,216) in only public hospitals in Ghana". There has been increased rates of morbidity and mortality around the world pertaining to foodborne diseases. Recently, the demand for meat (beef) has increased due to the rampant issues concerning chicken importation into the country – Ghana. Nonetheless, alarms have also been raised in the past about the role of meat and meat products in food poisoning (Soyiri *et al.,* 2008). The likelihood of fresh meats being contaminated with bacteria is high and most importantly when it's being mishandled which can be harmful to the human body when consumed. A system that ensures food safety is Hazard Analysis Critical Control Points (HACCP) (Baş *et al*., 2007), but it is not implemented widely (Murat *et al.,* 2006). Therefore, poorly designed infrastructure for the slaughtering and processing of meat can easily lead to contamination of food products and lead to food-poisoning incidents.

With increasing number of Ghanaians purchasing meat from open markets, this study sought to determine the factors associated with food safety (FS) practices among raw meat handlers in Turaku slaughter slab and Madina market.

1.3 Justification

Contamination and unhygienic foods leading to diarrheal diseases are among the leading causes of illness and deaths in low- income countries (Rheinländer *et al*., 2008). Ayçiçek *et al.* (2004) reported on a rate of 22%. Food safety is a social responsibility as meal is a product wherein intake is not only a count of preference, but in the long run, it's a matter of life and demise. Food handlers are very crucial people whilst thinking about food protection. Their hygiene practices affect the people who consume what they buy from them. Food borne ailment outbreaks will generally tend to have an impact at the country's financial system if records on expertise and practices on meals safety and hygiene are not sought from meat handlers.

Food safety should be a major concern for all food handlers (Calopez *et al.*, 2017).

1.4 General objectives

The main objective of the study was to determine the factors associated with food safety practices among raw meat handlers in Turaku slaughter slab and Madina market.

1.4.1 Specific objectives

The study specifically sought to:

1. Assess the knowledge on food safety among raw meat handlers in Turaku slaughter slab and Madina market;

2. Assess the practices on food safety among raw meat handlers in Turaku slaughter slab and Madina market;
3. Determine the relationship between knowledge and practice among the study groups.

1.5 Conceptual Framework

The conceptual framework attempts to explain the factors that are associated with food safety practices among raw meat handlers. A raw meat handler will be considered to have good or poor FS practices based on a number of factors. Some of these factors are how knowledgeable the person is on food related issues such as cross-contamination, foodborne diseases associated with poor meat handling, practicing personal hygiene, also if the person has ever enrolled in any food safety training.

All these factors mentioned above may be influenced to a large extent by the age, level of education and even sex of the meat handler. Also one's position at work can influence his or her hygienic practice, the duration the person has worked as a butcher or as a slaughter house worker.

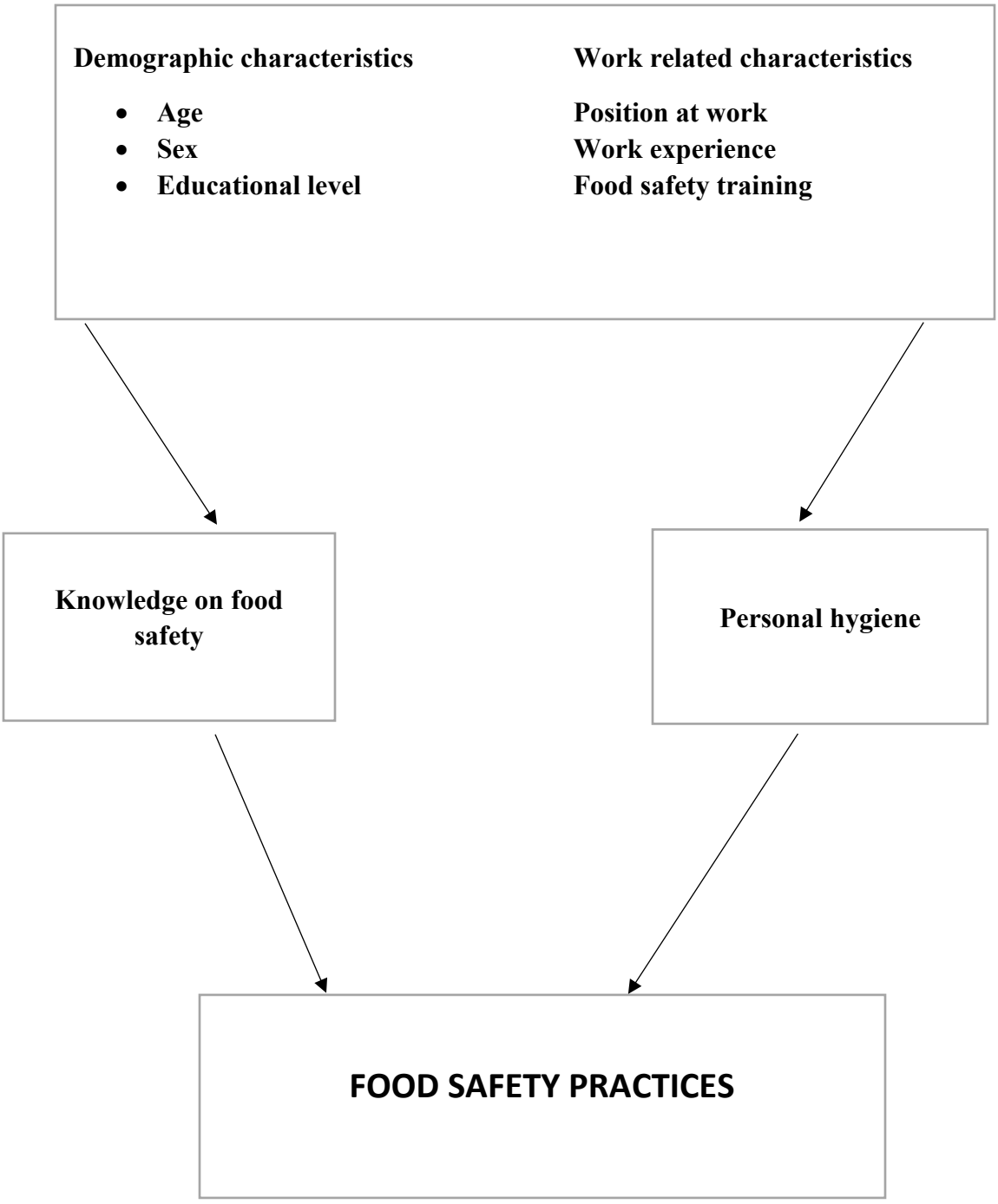


Figure 1: Conceptual Framework on the factors associated with food safety practices among raw meat handlers

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Food Safety

Food safety is the assurance that food will no longer cause any harm to the consumers taken in its present state as it is (FAO/WHO, 2001). Food safety has been identified as an essential public health concern. The World Health Organization global food safety strategy advocates for food safety programs based on a broader science-based concept of risk assessment, risk management through process controls along the entire production chain and risk communication (Kioko, 2012). Five core keys to food safety have been established by WHO. These include keeping clean hands, separating raw and cooked food, cooking thoroughly, keeping food at safe temperatures, and using safe water and raw materials (WHO, 2006). These five keys to the safety of food are of greatest importance in developing countries where food handlers in such countries can have access to the information and could impact significantly on food safety.

The primary responsibility for meat safety therefore lies with those who produce, process, distribute, trade and consume food (WHO, 2002). These include the livestock producers, livestock traders, slaughterhouse operators, meat transporters, butchers and the consumers (Kioko, 2012). They should operate according to the principles of good agricultural practices, good animal feeding practices, good veterinary practices, good hygienic practices, good manufacturing practices and Hazard Critical Control Points Kioko (2012) further reported. Chipabika (2014) reported an observation that food safety is becoming a key public health priority because a large number of people take their meals outside their homes.

As a result of this, they are being exposed to food borne illnesses that originate from food stalls, restaurants and other food outlets. Lack of food safety among food handlers, which may be due to lack of education, low level of education and environmental factors leading to food borne outbreaks further causes a substantial cost to the individuals and the country's economy (Egan et al., 2007).

Foodborne sicknesses occur normally in developing international locations specially in Africa due to the triumphing terrible meals handling and sanitation practices, inadequate food protection laws, vulnerable regulatory structures, loss of economic resources to put money into safer device and shortage of schooling for food-handlers (Haileselassie *et al., 2*013).

On the streets of Accra in Ghana, 60,000 individuals sell an envisioned a hundred million well worth of food yearly and majority of these individuals rely on butchers everywhere in the metropolis for his or her deliver of meat as pronounced by Soyiri et al., (2008). Conclusions from this indicated that, there has been a drastic decrease in the demand for hen products as that of meat has increased nationwide. Issues have also been raised about the role of meat and meat merchandise in meals poisoning. Consistent with middle for ailment manage and prevention, at the same time as physicians and other fitness care professionals have a critical position in surveillance for and prevention of potential disease outbreaks, only a fragment of the folks that enjoy gastrointestinal tract signs and symptoms from foodborne illness seek hospital therapy (Addison, 2015). Information indicates that extra than 74% of incidents of meals poisoning are due to meat dishes (Soyiri et al., 2008)

2.2 Training on Food Safety and Hygiene Practices

For every business, there's the need for regular training for a change in behavior and attitude among staffs. Subsequently, the training of food handlers is very vital in the improvement of food safety and the prevention of foodborne illnesses. Hazard Analysis and Critical Control Point (HACCP) is a system that permits the production of secure meat and poultry through the evaluation of production approaches, identification of all dangers which can probably occur in the manufacturing, the identity of essential factors in the method at which these dangers can be introduced into product and consequently have to be managed, the establishment of critical limits for manage at the ones factors, the verification of those prescribed steps, and the strategies with the aid of which the processing established order and the regulatory authority can display how well managed through the hazard analysis control point (World Health Organization, 1996). There's the need for increased implementation of HACCP and consumer food safety education efforts as raw retail meats stand a high chance for transmitting food borne diseases (FBD's).

Wandolo (2016) reported a quantitative survey carried out in Australia on training trends on food safety management which indicated that effective education and training programs provide the best way of improving safety awareness among food handlers. The report further indicated that there was need to train, especially food managers, on safety and hygiene in order to improve their capacity to deal with issues related to food safety. According to a literature reviewed, managers of food businesses considered some food safety measures difficult, burdensome, and unnecessary (Luiza *et al.,* 2005).

In spite of this, meat handlers (MH's) training represents one of the simplest techniques to keep in controlling the dangers which can have an effect on meals safety (Jianu & Goleț, 2014). A study conducted in Thailand indicated the need for governments to formulate food safety policies that would include educating proprietors on the benefits of safe food. A further study by Luiza et al., (2005) showed that food safety and hygiene training have been imposed on some countries before granted to retail butchers who sell raw meat because training courses doesn't only provide knowledge or add up to existing knowledge but rather, reflects in behavioral change (Nee & Sani, 2011).

A similar study also discovered awful training involvement due to recruitments from lower socio- economic lessons with fewer educational opportunities, fast personnel turnover, high number of seasonal body of workers, literacy and language problems, and terrible motivation due to low pay and occasional task fame. Therefore, another educational strategies, including those based on motivational well-being education and merchandising models are required (Angelillo *et al.,* 2000).

2.3 Knowledge and Practice of Meat Handlers

Wandolo (2016) reported on a study which revealed whether effective food safety programs which are held for meat handlers to acquire new skills were really transferred to the job setting. The report further indicated that, these training programs were recommended for all cadres of staff of various levels for them to be knowledgeable about the dangers of food-borne illnesses and their prevention. Luiza et al., (2005) revealed in their study that most food hygiene training effectiveness was centered on managers or proprietors of meat processing plants whose level of education is high and assumed that they don't even handle meat. However, their study was

geared towards the training of practicing butchers, whose educational level was low of which most had only primary schooling. Findings from Abdul-Mutalib et al., (2012) showed that knowledge and attitude had a significant association with practice. This is therefore evident that having good knowledge and attitude will lead to good practice measures. Their study suggested that education and regular training should strengthen meat handlers' knowledge in areas which seems to be lacking in order to minimize foodborne hazards. It's been indicated by Ansari-Lari et al., (2010) that most foodborne outbreaks are caused by improper food handling.

2.4 Personal Hygiene

Qualities of good hygiene, professionalism, style and image of an institution is depicted by the food handlers as this projects the standard of the establishment (Wandolo, 2016). A researcher reiterated that in order to improve personal hygiene among food handlers, all members of staff must be trained. A survey performed in Ethiopia indicated 61.5% of workers did no longer take any education on food safety and hygiene (FSH). However in line with literature, training of food handlers regarding the primary ideas and necessities of personal hygiene performs an integral part in ensuring safe merchandise to the customer. Terrible personal hygiene particularly non washing of hands with soap has been discovered to be related to the transmission of pathogens amongst road meals carriers (Addison, 2015). A study conducted among food handlers in general revealed that majority of women covered their hair but this was contrasted in the fact that, it was so due to socio-cultural mode of dressing and necessarily for the sake of food safety or consumer assurance. Studies conducted among head chefs showed that 88% of them had knowledge on food safety but it juxtaposed with the personal hygienic practices which showed their non-use of disposable gloves when handling or

distributing food (39.6%), tasting food with their hands (28.7%), and usually talking while handling food (52.5%) (Rebouças et al., 2017). Abdullah & Siow (2014) suggested that supervisors and managers should provide hand sinks, soap, and towels on site for the success of food safety. Also, heads should serve as role models by always conforming to the personal and general hygiene themselves, because if management is not taking these seriously, then their subordinates will not do so either.

2.5 Environmental Hygiene

A microbial survey on red meat processing plant indicated that environmental sources of contamination such as flooring, walls and working surface were enormous sources of usual microbial contamination. However, powerful cleaning and sanitation programs and secure handling strategies are crucial for making sure a safe and high fine product (Eisel *et al.,* 1997). Researchers found that tools used in the slaughter house and butcheries were not kept well as these were also carriers of bacteria. There was an observation which had to do with the working space. It was observed that work space in butcheries was small which was inadequate for the movement of workers as this may lead to the risk of accidents, contracting of contagious diseases and even inducing stress.

A study conducted by Haileselassie et al., (2013) in abattoirs and butchery shops revealed that there were no preventive measures put in place for flies, insects and rodents. These organisms, when exposed to tissues of the carcass, may contaminate the meat. Similarly observation also confirmed that there has been no right disposing system and as an end result, the pile up of paunch contents and other solid wastes, faeces, horns, scraps of tissue and different strong

wastes had been found near to the abattoir which served as a residence for rodents, cats, dogs, and vultures.

2.6 Foodborne Pathogens and Meat Handling

A study conducted by Abdullah & Siow (2014) indicated that food handlers were not knowledgeable in foodborne pathogens associated with food, especially meat.

This end result, however, was proven in a study by means of Ansari-Lari et al., (2010) which stated that more than half of their respondents did not know *Salmonella*, Hepatitis A and B as well as *Staphylococcus aureus* had been the various pathogens-inflicting ailment. *Staphylococcus aureus* is considered as the most risky FBP. Bacterial dealers most customarily diagnosed in sufferers with foodborne illnesses are *Campylobacter, Salmonella*, and *Shigella* species, with substantial version going on through geographic region and season (Addison, 2015). *Salmonella*, non-typhi *Salmonellae, Campylobacter* and *E.*coli can survive on finger tips and other surfaces for distinctive lengths of time and even in a few cases after hand washing. It is consequently suitable for food handlers usually to preserve their nails quick and easy to save you them from serving as a vehicle for transmission of pathogens. *Salmonellosis* is also recognized for the transmission of food borne zoonoses in developing nations which inside the same way, varies from one country to another because of the inadequacy of epidemiological surveillance (Bayleyegn *et al.,* 2003). A microbial survey indicated highest microbial counts Aerobic Plate Count (APC), Coliform Count (CC) and Escherichia Coliform Count (ECC) were found in raw incoming meat for airborne especially carcass beef and boxed beef. Bayleyegn *et al.* (2013) suggested that there should be a periodic surveillance by agricultural and veterinary officers in order to reduce to *Salmonella* contamination in meat so

as to prevent the infection to man Foods of animal origin have been considered as the main source for *Campylobacter* infection in humans (Woldemariam *et al.,* 2009). Few published reports in Ethiopia brought to the light that there's an increased risk of FBP transmission to humans as raw meat, particularly beef is consumed by almost everyone in the country. A study conducted in an abattoir revealed that heavy contamination begun from the slaughter house. The first source during evisceration and washing of the carcass followed by the intestinal tract which is a major source of enteric pathogens during the slaughtering process (Woldemariam et al., 2009). They further suggested that during slaughtering, the oesophagus which serves as a major opening into the system should be tied to prevent. Subsequent studies have further indicated that the inverted dressing that is, dressing of the carcass head upwards can greatly reduce the rate of contamination. Abattoir is one of the food industries that make contributions to the trouble of viable foodborne diseases and potential dangers associated with food except the principles of food protection are applied. This hygiene issues aren't restricted to slaughtering residence, however, additionally associated with incorrect processing and marketing practices (Haileselassie et al., 2013).

CHAPTER THREE

3.0 METHODS

3.1 Study Design

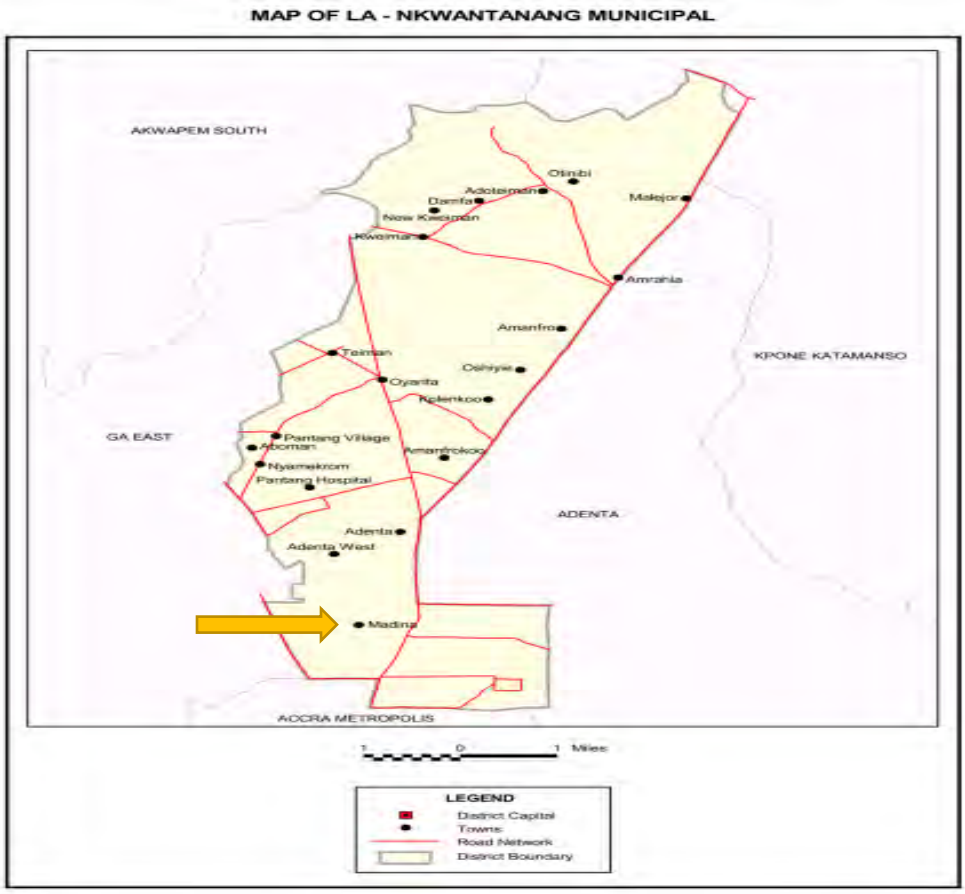
A descriptive cross sectional study was carried out to study the factors associated with food safety and hygiene practices among raw meat handlers. The study used quantitative data on factors associated with food safety and hygienic practices amongst raw meat handlers at the Turaku slaughter slab and Madina market. It assessed knowledge on food safety and personal hygiene practices amongst meat handlers with the help of a structured questionnaire.

3.2 Study site

The study was conducted in the Greater Accra Region, Ghana, which focused on 2 distinct areas in the region located in 2 districts. These districts are: Kpone-Katamanso District Assembly and La- Nkwantanang Madina Municipality. The study was conducted at Turaku slaughter slab and Madina market. These study areas were selected for the purpose of this study mainly because they serve as the central supplier of meat to its populace.

The La- Nkwantanang Madina municipality is placed inside the extra Accra area. It is one of the sixteen Metropolitan, Municipal and District Assemblies inside the vicinity and became an assembly in 2012 as part of the newly created Assemblies geared toward deepening decentralization and bringing improvement to the door step of residents. La-Nkwantanang Madina Municipal was created by means of Legislative Instrument (L.I.) 2131 and inaugurated in June 2012. It turned into carved out of the Ga East Municipality. The La- Nkwantanang-Madina Municipality is located at the Northern a part of the more Accra region.

La Nkwantanang-Madina Municipality has 84% of its population living in urbanized areas. The main economic activities in the La Nkwantanang Madina Municipality are commerce, agriculture, services and manufacturing. Trading is one of the main economic activities in the Municipality with the Madina market as the main trading centre. It generates employment and revenue to the people in the Municipality and for this reason, the Madina market will be chosen for the purpose of my study (Ghana Statistical Service, 2014)



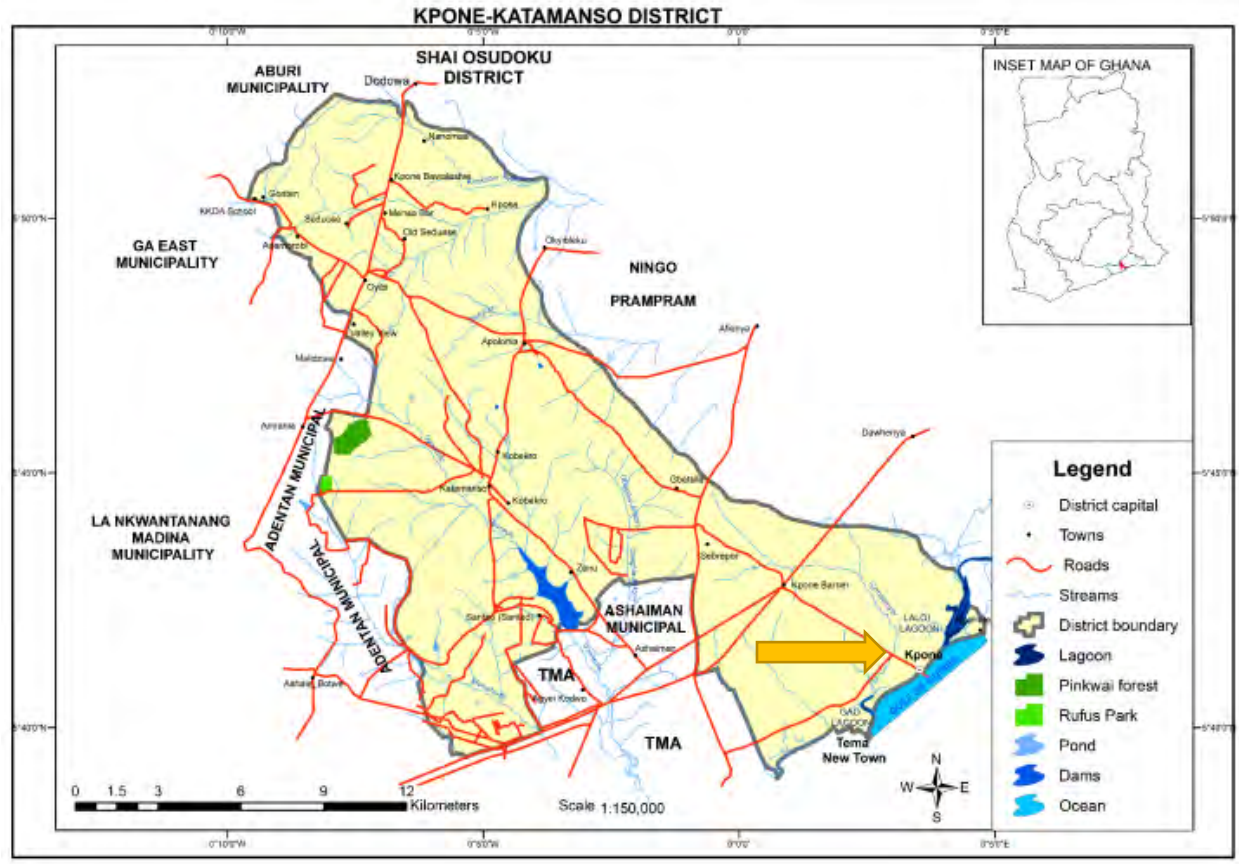
Source: Ghana Statistical Service, 2014

Figure 2: Map of La Madina-Nkwantanang with study site Madina indicated

The Kpone-Katamanso District Assembly (KKDA) was carved out of Tema Municipal Assembly (TMA) in June 2012 with the promulgation of Legislative Instrument (L.I.) 2031. It was inaugurated on 28th June, 2012 but commenced administrative work on 4th July, 2012

The District Assembly which is the highest political and administrative authority in the district. Kpone-Katamanso is located at the Eastern part of the Greater Accra Region and stretches from the coast to the southern lower slopes of the Akuapim mountains. Kpone-Katamanso is only 38 kilometres drive from Accra, the capital city of Ghana and falls on longitude 004'0E and latitude 50 40' 60N.

The District shares boundaries with Ningo Pampram District on the South East and Tema Metropolitan Assembly on the South West and the south by the Gulf-Of-Guinea, Ningo-Prampram District on the South East and Tema Metropolitan Assembly on the South West and the south by the Gulf-Of-Guinea and to north is SODA on the North East and LA Dadekotopong Municipal Assembly on the North West and on the North by Akwaping South (Kpone-Katamanso District Assembly, 2015).



Source: Kpone-Katamanso District Assembly, 2015

Figure 3: Map of Kpone-Katamanso District Assembly with study site indicated

3.3 Study Variables

3.3.1 Independent variables:

age, sex, education, position at work**, e**ver attended FSH training course, work experience, knowledge on food safety and personal hygiene.

3.3.2 Dependent variable:

Food safety practices

3.4 Study Population

The study population was made up of raw meat handlers. Butchers from Madina market and slaughter house workers at Turaku slaughter slab.

3.5 Inclusion and Exclusion Criteria

3.5.1 Inclusion Criteria

The study included all meat handlers in the slaughter house and the butchery, that is, those who have direct contact with meat and meat surfaces.

3.5.2 Exclusion Criteria

The study excluded meat handlers outside the slaughter house and butchery, that is, 'khebab' sellers and cold store operators.

3.6 Sampling

3.6.1 Sample Size

A complete census of the entire population of raw meat handlers were used.

Population size = 200

3.6.2 Sampling Method

Everyone had the opportunity to participate in the research.

3.7 Data Collection Tool

A structured and modified closed ended questionnaire was developed for the study. The questionnaire was divided into four parts consisting of Section A (socio-demographic characteristics), Section B (knowledge on food safety), Section C (personal hygiene) and Section D (food safety practices). Section A was designed to determine the meat handler's socio-demographic characteristics including age, gender, level of education, position at work and length of time of service. Section B also captured knowledge on food safety such as foodborne pathogens and cross-contamination. The section C part of the questionnaire consisted of questions pertaining to personal hygiene such as hand washing pattern wearing of gloves, and apron which was followed by an observation. Basically, the activities of daily living. The Section D took questions in relation to practices pertaining to food safety.

3.7.1 Data collection method

Data was collected by the use of a structured questionnaire in English. Data collection was done at the various study sites- Madina market and Turaku Slaughter slab.

3.7.2 Quality Control

The questionnaire used for this study was easily understood and self-explanatory. Two research assistants were trained and supervised to administer questionnaire effectively and also, they were monitored to implement the task given to them appropriately throughout the data collection process until the study was over.

3.8 Data Processing and Analysis

Data processing and analysis was done using STATA version 15 and Microsoft Office Excel. Responses to questions were coded before entry. Descriptive statistics on the data that was collected on most variables in the study used these statistical parameters-frequencies and percentages. Cross tabulations and chi-squared tests were used to check the association between the independent and dependent variable.

3.9 Ethical Consideration

3.9.1 Ethical approval from Ghana Health Service and study area

Ethical clearance was obtained from the Ethical Review Committee of the Ghana Health Service (GHS). Permission to conduct the study was sought from the District Assembly of Madina and the Kpone-Katamanso District Assembly. Also, individual meat handlers selected were given a written and verbal consent when they agreed to participate. The study was solely for academic purposes; hence raw meat handlers was not identified by names but rather coded during dissemination of results.

3.9.2 Informed consent

Informed consent was sought from participants before the questionnaires were administered. Participants were allowed to withdraw from the study at any point in time if they so wish. Participants were however informed about the right to refuse participation in the study without it affecting their job or business.

3.9.3 Privacy and confidentiality

Questionnaires were administered anonymously to avoid bias and association of questionnaires to particular study participants. Also, information was secured and stored at the School of Public Health, University of Ghana, Legon.

3.9.4 Incentives/Compensation

Subjects who partook in the study were very appreciated for their time. However, there were not compensation for participating in the study.

3.9.5 Potential risks/benefits

This study did not cause any harm neither did it cause discomfort to participants. Results gotten from the study were beneficial for proper handling of meat and food in general in order to reduce the risk of foodborne diseases.

3.9.6 Data storage

Data collected was password secured to prevent any unauthorized access. All names of respondents was anonymized. Backup for the data was saved and kept in a secured place. The Principal Investigator kept all data collected during the study until it is ready to be published, after which it will be discarded.

3.9.7 Conflict of Interest

This research was self-financed. The principal investigator of the study worked with two other research assistants. Principal Investigator did not, however, have any other personal interest in this study other than academic and public health benefits.

CHAPTER FOUR

4.0 RESULTS

4.1 Background

This chapter emphasizes on quantitative cross-sectional research conducted among raw meat handlers concerning the factors associated with food safety practices.

It assessed the knowledge on food safety practices among raw meat handlers, assessed the practices on food safety among raw meat handlers and determined the relationship between knowledge and practice among the study groups.

4.2 Socio-demographic distribution of respondents

This study interviewed a total of 200 males on the factors associated with food safety practices among raw meat handlers. The percentage of respondents aged between 18 to 30 years was 40% and those between the ages of 31 to 45 years made up 37.5% whiles those between 46 and 60 made up 21.5%. Those above 60 years constituted 1% of the total study sample.

With the educational level, it was identified that 28.5% had no formal education, 48.5% were basic school leavers, that is, had attended either primary or junior high school, 10% constituting secondary graduates whiles 13% had tertiary education. None of the respondents had undergone or attended any food safety training.

For work position, 76.5% were workers whiles 23.5% were owners. Considering the level of working experience, respondents who have been in the meat handling field for 1 month to 1 year were 1%, those who had worked for 1 year to 5 years were 61.31% forming the majority

of the sample with 15.08% being those who had worked for 6 to 10 years whiles 22.61% constituting those who had worked for 10 years and above.

Table 1: Socio-Demographic characteristics of respondents

	Characteristics	Frequency n=200	Percentage
Age			
	18-30 years	80	40
	31-45 years	75	37.5
	46-60 years	43	21.5
	60+ years	2	1
Education			
	None	57	28.5
	Basic(Primary/JHS)	97	48.5
	Secondary(SHS/Vocational/Technical)	20	10
	Tertiary/(Polytechnic)	26	13
Safety Training			
	Yes	0	0
	No	200	100
Work position			
	Worker	153	76.5
	Owner	47	23.5
Working experience in years			
	1 month-1 year	2	1.01
	>1-5 years	122	61.31
	6-10 years	30	15.08
	10+ years	45	22.61

4.3 Respondents' Knowledge on Food Safety Practices

Respondents' knowledge on food safety practices were assessed and results presented in Table 2. Averagely, respondents' were aware of the mode of contamination of meat as 66% of them indicated that food contamination is minimized when hands are washed before work begins and 56% establishing the fact that food contamination is minimized when gloves are used during work. Most of the respondents (16%) did not give a correct answer to the statement "Food contamination increases when one eats or drinks in the workplace". 65.5% and 35% respectively of the respondents were able to identify the vulnerable groups of food poisoning, and whether meat is a transmitter of food borne diseases. Respondents failed to select the correct responses for statements on bloody diarrhea, typhoid and abortion by 37%, 14.5% and 0.5% respectively. Knowledge response on the need to take a sick leave during skin disease was about 31%. 92% of responses on the importance of freezer temperature in the storage of meat were incorrectly answered. 80.5% of respondents gave correct responses to the negatively formed statement on "other food items like vegetables can be stored together with meat in a freezer", and 57.5% gave correct responses on the necessity to allow meat to thaw before cutting. In determining their knowledge on foodborne pathogen, correct responses on Salmonella, Hepatitis A virus, Hepatitis B virus, Staphylococcus and Clostridium Botulinum were 2.5%, 4%, 2%, 1% and 3% respectively.

Table 2: Respondents' knowledge on food safety practices

Statements on Knowledge on Food Safety Practices	N (%)	
	YES	NO
Food contamination is minimized when hands are washed before work begins	132 (66)	68 (34)
Food contamination is minimized when gloves are used during work	112 (56)	88 (44)
Food contamination increases when one eats and drinks in the work place	32 (16)	168 (84)
Children, adults, pregnant women and old-ages can get food poisoning	131 (65.5)	69 (34.5)
Eating meat causes food borne disease	70 (35)	130 (65)
Eating meat can cause AIDS	0 (0)	200 (100)
Meat causes bloody diarrhea	74 (37)	126 (63)
One can contract typhoid through food	29 (14.5)	171 (85.5)
Foodborne disease can induce abortion in pregnant women	1 (0.5)	199 (99.5)
Taking a sick leave is necessary when you have a skin disease	62 (31)	138 (69)
Freezer temperature is very important in the storage of meat	16 (8)	184 (92)
Other food items like vegetables can be stored together with meat in the freezer	39 (19.5)	161 (80.5)
It's necessary to allow meat to thaw before cutting	115 (57.5)	85 (42.5)
Foodborne pathogens may include:		
Salmonella	5 (2.5)	95 (97.5)
Hepatitis A virus	8 (4)	182 (96)
Hepatitis B virus	4 (2)	196 (98)
Staphylococcus	2 (1)	198 (99)
Clostridium Botulinum	6 (3)	194 (97)

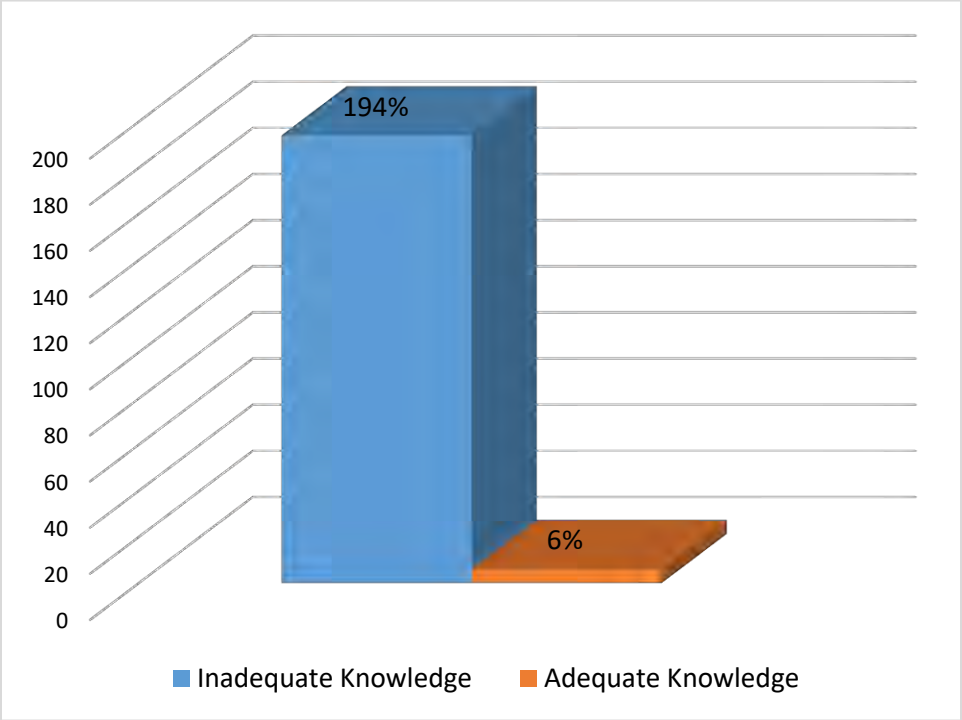


Figure 4: Knowledge on food safety practices among raw meat handlers

As shown in Figure 4 above, it's evident that respondent's did not have adequate knowledge on food safety (194%). With reference to Table 2, respondents were abreast with the mode of food contamination but had limited knowledge on the food pathogens (*Salmonella,* Hepatitis A and B viruses *Staphylococcus* and *Clostridium Botulinum*) associated with meat – 2.5%, 4%, 2%, 1% and 3% respectively.

4.4 Personal hygiene practices of raw meat handlers

Table 3 below shows personal hygiene practices among raw meat handlers. 22.5% of respondents confirmed that they use gloves while working and of this percentage, 19% washed hands before using gloves. Averagely (57.5%), raw meat handlers indicated that they wore

apron. 0.50% of raw meat handlers wear a nose mask whereas none 0% wore a hair cap. Further, 95.5% confirmed that they washed their hands regularly, however, 84% washed before touching raw meat and 95.5% washed after touching raw meat. Raw meat handlers indicated that smoking was not allowed in their workplace.

Table 3: Responses on personal hygiene

	N (%)	
Statements on Personal Hygiene	YES	NO
Do you use gloves while working?	42 (22.5)	155 (77.50)
Do you wash your hands before using gloves?	38 (19)	162 (81)
Do you wear an apron during work?	115 (57.5)	85 (42.5)
Do you use a nose mask during work?	1 (0.50)	199 (99.50)
Do you wear cap during work?	0	200 (100)
Do you wash your hands regularly?	191 (95.5)	9 (4.50)
Do you wash your hands with soap before you touch raw meat?	168 (84)	32 (16)
Do you wash your hands with soap after you touch raw meat?	191 (95.5)	9 (4.50)
Is smoking allowed in your work place?	0	200 (100)

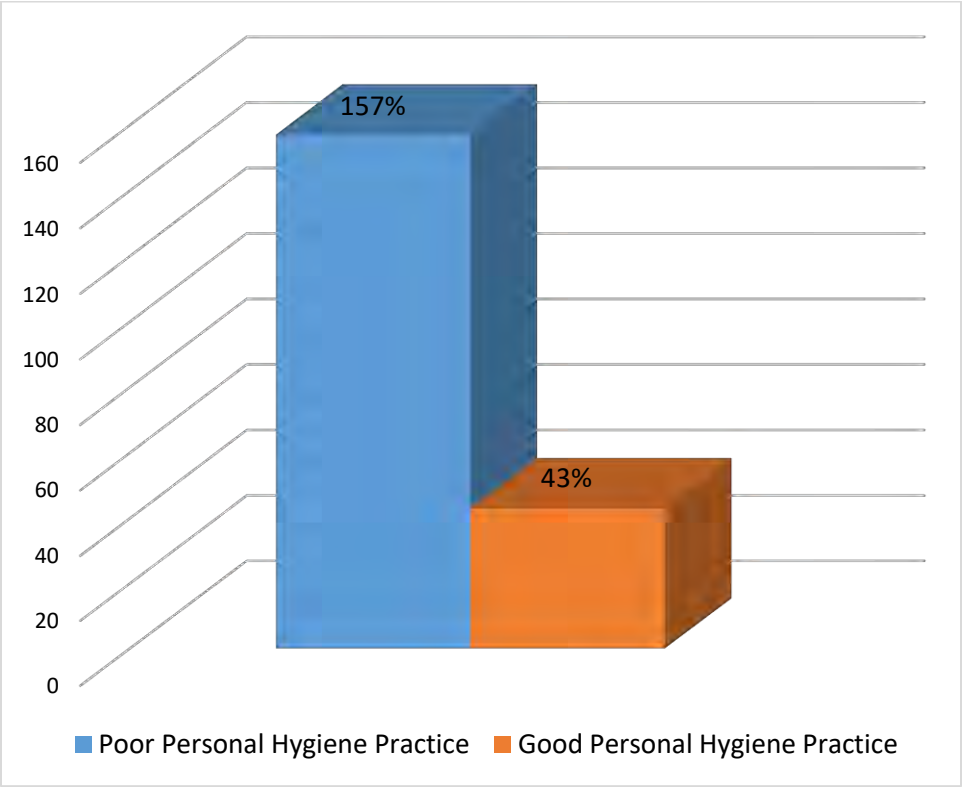


Figure 5: Personal hygiene practices on food safety

The Figure above confirms that raw meat handlers have poor personal hygiene practices. With reference to Table 3, personal protective equipment (gloves -77.5%; nose mask - 99.5%; hair cap - 100%) were not adequately used by raw meat handlers. However, hand washing practices were utilized (95.5%).

Table 4: Responses on food safety practices

Statements to determine practices on food safety	Not always	Sometimes	Always
Working environment must be tidied in advance	1 (0.5%)	4 (2%)	195 (97.5%)
Hands must be washed before work starts	5 (2.5%)	24 (12%)	171 (85.5%)
Working with unclean hands must be avoided	3 (1.5%)	20 (10%)	177 (88.5%)
Mouth and nose is covered when coughing or sneezing	5 (2.5%)	152 (76%)	43 (21.5%)
Hands can be cleaned with an apron	167 (83.5%)	1 (0.5%)	32 (16%)
Smoking while working is inappropriate	2 (1%)	-	198 (99%)
Rubbing hands on face and hair while working isn't appropriate	4 (2%)	11 (5.5%)	185 (92.5%)
Wedding ring and a watch can be worn while handling meat	32 (16%)	2 (1%)	166 (83%)
Many places can be cleaned with the same towel	182 (91%)	9 (4.5%)	9 (4.5%)
Defrosted meat should not be refrozen	154 (77%)	41 (20.5%)	5 (2.5%)
Meat should not come in contact with wounded (sore) hand	37 (18.5%)	112 (56%)	51 (25.5%)

4.5 Respondents' practices on food safety

Respondents' were asked statements to ascertain their practices on food safety and when raw meat handlers were asked whether working environment must be tidied in advance, 0.50% said they didn't do that always but majority (97.50%) of them said they always do whiles 2% does it sometimes. 85.5% of them always washed their hands before work begins, 2.5% and 12% did that not always and sometimes, respectively.

Apart from 1.5% and 10% of respondents who worked with unclean hands not always, and sometimes respectively, 88.5% avoided working with unclean hands. 76% of the meat handlers sometimes cover their mouth and nose when coughing or sneezing, 2.5% did that not always whiles 21.5% did it always. Most (83%) of the respondents selected always in response to whether they wear wedding ring and watch while handling meat. However, they (112%) sometimes touched meat with wounded (sore) hand.

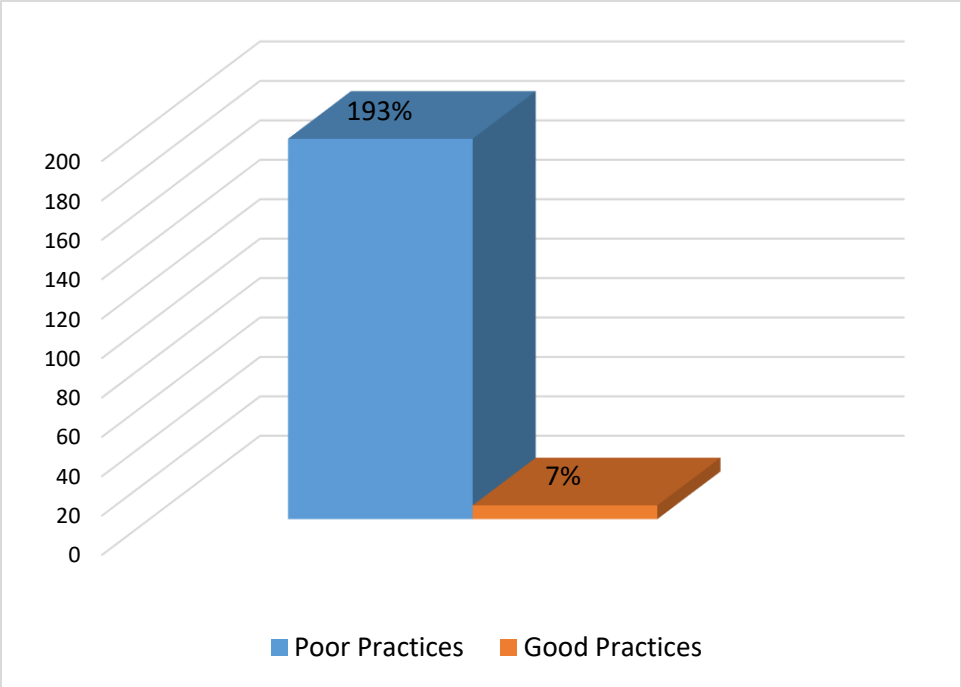


Figure 6: Practices on food safety

In Figure 6 above shows that a great number (193%) of the raw meat handlers do not practice good food safety practices. From Table 4, in as much as 97.5% cleaned their environment before starting work, 76% and 56% sometimes covered their mouth or nose when sneezing or coughing and contacted meat with a wounded (sore) hand, respectively.

Table 5: Socio-demographic characteristics associated with knowledge of respondents' on food safety

Characteristics	N (%)	Chi - Square (χ^2)	*P*-value
Knowledge on food safety			
Age			
18-30 years	2 (2.5)		
31-45 years	0 (0)		
46-60 years	2 (4.65)		
60+ years	2 (100)	67.4578	<0.001
Education			
None	0 (0)		
Basic(Primary/JHS	2 (2.06)		
Secondary(SHS/Vocational/Technical)	2 (4.76)		
Tertiary/(Polytechnic)	6 (3)	7.3912	0.060
Work position			
Worker	2 (1.31)		
Owner	4 (8.51)	6.4113	0.011
Working experience			
1 month-1 year	2 (0)		
1-5 years	2 (1.64)		
6-10 years	2 (6.67)		
10+ years	2 (4.44)	2.5342	0.469

Table 5 above displays a cross tabulation between socio-demographic characteristics and knowledge on food safety among respondents. It can be seen that there is a significant association between work position (χ^2= 6.4110; p= 0.011) but there was no association between age, education and work experience.

The table below shows a cross tabulation of socio-demographic data and personal hygiene on food safety. It can be seen that there is a relationship between all the socio-demographics; age (χ^2=128.3239; p= <0.001) education (χ^2=130.752; p= <0.001), work position (χ^2=137.5872; p= <0.001), work experience (χ^2=155.4417; p= <0.001).

Table 6: Socio-demographic characteristics associated with personal hygiene of respondents' on food safety

Characteristics	N (%)	Chi- Square (χ^2)	*P*-value
Personal Hygiene on Food Safety			
Age			
18-30 years	2 (2.50)		
31-45 years	4 (5.33)		
46-60 years	36 (83.72)		
60+ years	1 (50)	128.3239	<0.001
Education			
None	1 (2.94)		
Basic(Primary/JHS	3 (3.09)		
Secondary(SHS/Vocational/Technical)	3 (11.11)		
Tertiary/(Polytechnic)	36 (85.71)	130.752	<0.001
Work position			
Worker	4 (2.61)		
Owner	39 (82.98)	137.5872	<0.001
Working experience			
1 month-1 year	0 (0)		
1-5 years	2 (1.64)		
6-10 years	1 (3.33)		
10+ years	40 (88.89)	155.4417	<0.001

Results in table 7 below shows a chi-square test that was used to find an association between respondent's socio-demographic characteristics and their food safety practices. From the results, there is a relationship between years of working experience and food safety practices (χ^2 =19.1774; p=<0.001).

Table 7: Socio-demographic characteristics associated with food safety practices of respondents

Characteristics	N (%)	Chi-square (χ^2)	*P*-value
Food safety practices			
Age			
18-30 years	4 (5)		
31-45 years	1 (1.33)		
46-60 years	2 (4.65)		
60+ years	0 (0)	1.8166	0.611
Education			
None	0 (0)		
Basic(Primary/JHS	3 (3.09)		
Secondary(SHS/Vocational/Technical)	3 (11.11)		
Tertiary/(Polytechnic)	1 (2.38)	6.0674	0.108
Work position			
worker	4 (2.61)		
owner	3 (6.38)	1.5119	0.219
Work experience			
1 month-1 year	1 (50)		
1-5 years	1 (0.82)		
6-10 years	3 (10)		
10+ years	2 (4.44)	19.1774	<0.001

Table 8: Factors influencing food safety practices

	Beta Coefficient	**(95% CI)**		***P*-value**
Knowledge	0.060338	-0.06731 -	0.187984	0.352
Personal hygiene	0.784141	0.469065 -	1.099217	<0.001
Age				
18-30 *(Ref)*				
31-45 years	-0.94598	-1.69549 -	-0.19647	0.014
46-60 years	0.44454	-1.56637 -	2.455455	0.663
60+ years	0.74503	-1.80089 -	3.290948	0.564
Education				
None *(Ref)*				
Basic(Primary/JHS)	-0.31998	-0.97637 -	0.33641	0.337
(SHS/Vocational/Technical)	-1.23655	-2.00904 -	-0.46406	0.002
Tertiary/ (Polytechnic)	-0.97144	-2.93522 -	0.99233	0.33
Work position				
Worker *(Ref)*				
Owner	2.340116	0.459763 -	4.22047	0.015
Work experience				
1month-1year *(Ref)*				
1-5years	-1.00784	-3.06481 -	1.049129	0.335
6-10years	-1.02921	-3.13502 -	1.076613	0.336
10+years	-4.82739	-7.02729 -	-2.62748	<0.001
Constant	13.09927	10.71959 -	15.47895	<0.001

A linear regression analysis was carried out to establish an association between independent variables and the dependent variable (food safety practices) and results shown in table 8 above. Out of all the independent variables, the coefficient of the personal hygiene practice of meat handlers ($p<0.001$), age of those between 31 – 45 years ($p=0.014$), those with secondary level of education ($p=0.002$), owners of a meat shop ($p= 0.015$) and meat handlers with above 10

years of working experience ($p<0.001$) were significant. This implies that owners of a meat shop and their years of working experience increases the probability of one practicing good safety practices. The coefficient for the age of the respondents ($p=0.014$) was significant with a negative sign showing an inverse relationship between age and the probability of a raw meat handler practicing good food safety practices. This shows that older raw meat handlers show less interest in food safety practices.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

The chapter discusses the results of the study on the factors associated with food safety practices among raw meat handlers at the Turaku Slaughter Slab and Madina Butchery Shop, Accra.

5.2 Background of Respondents

The study revealed that all the participants were males and none had attended any food safety training. Results obtained on gender was contrary to most literature as researchers documented more females in many food handling facility as females are well-known of their proper personal hygiene and food handling practices (Chipabika, 2014; Wandolo, 2016; Abdallah *et al*., 2013). It wasn't surprising in this study with results obtained on male's food safety practices. However, a different study on knowledge and practices among food handlers conducted by Kasturwar and Mohd (2011) found that majority of food handlers were males 52(62.7%) and 31 (37.3%) were females which is parallel to this study.

A research conducted by Haileselassie *et al.* (2013) opined that abattoir workers had never taken any food safety training which corroborates with this study. It was however indicated that food safety training is very important and forms the basic requirement of meat handlers. Further, a study on food hygiene practices among head chefs in Ireland additionally confirmed that members had no hygiene schooling and reiterated that it is a public health situation as human errors have been proposed as a contributory element in 97% of foodborne ailment

outbreaks and the frequency of human fault is because of the lack of education (Clayton & Griffith, 2004).

Most of the raw meat handlers were primary school leavers (48.5%). This finding is in contrast to a report by Owusu, P. (2010) that all food handlers in Accra have high educational level. Koraish (2014) reported the findings in a study on the assessment of food safety knowledge and hygiene among street food vendors in Alexandria that almost half of the study participants had either primary school education or none. Findings were similar to that of this study. Again, Koraish (2014) confirmed a link between food handlers with low educational levels and poor food safety practices. Findings from this study revealed a significant association between secondary school leavers and food safety practice ($p=0.002$).

Almost all (76.5%) of the raw meat handlers were workers and of this proportion, 61.3% had worked between one and five years. Addison (2015) reported on a trend which is similar to the results from this study that a good proportion of food handlers worked for people but the percentage reduced with increasing number of working experience.

5.3 Knowledge on food safety

According to Rahman *et al.* (2012), positive knowledge influences good practices. An observational study conducted by Ansari-Lari *et al*. (2010) indicated that food handlers who have good knowledge towards food safety depicted it in their practices but those with poor knowledge did not practice it. Results from this current study showed that respondent's had inadequate knowledge (97%) on food safety practices although correct responses were selected on the mode of food contamination. Raw meat handlers were not aware of foodborne pathogen and this was not surprising taking their educational level into consideration and the absence of

food safety training. Again, studies by Ansari-Lari *et al.* (2010) showed more than half of meat handlers who did not know foodborne pathogens like *Salmonella, Clostridium Botulinium*, Hepatitis A virus and Hepatitis B virus. In view of this study, unsatisfactory results were recorded when raw meat handlers were asked whether high risk population (children, pregnant women and the old age group) are likely to get food poisoning when they consume meat. It was not surprising when respondents gave wrong responses on whether eating meat can induce abortion in pregnant women. Jemmi & Stephan (2006) reported that *Listeria monocytogenes* is a disease found in ruminants who graze on grass with high pH therefore capable of inducing abortion in pregnant women who consume meat as "*Listeria monocytogenes* takes advantage of the natural localized immunosuppression at the maternal-fetal interface and causes abortions in pregnant women".

In this current study, 57.5% of respondents said it was necessary to allow meat to thaw before cutting with the notion that frozen meat is light in weight and therefore more meat pieces will be weighed and sold at a cheaper price. Unsafe thawing and inadequate temperature, however facilitates the growth of pathogens (Bolton *et al.*, 2008).s

The results from the regression module undoubtedly, indicates that there is no significant relationship between levels of knowledge and food safety practices at 95% level of confidence interval (P = 0.352).

Again, knowledge on food safety is vital because poor food safety practices has been suggested to be a contributory factor to foodborne disease outbreaks (Chipabika, 2014).

5.4 Practices of food safety

Personal hygiene is very essential in all food handling venture as the body is a mode of contamination. In the present study, results indicated that raw meat handlers have poor personal hygiene practices as 77.5% of raw meat handlers did not use gloves while touching meat, none (100%) wore a hair cap and 0.50% wore a nose mask. A similar study reported by Abdullah & Siow (2014) revealed that meat handlers admitted that they did not use gloves and was confirmed in a study by Abdallah & Elneim (2013). Addison (2015), reported a high proportion of food handlers used gloves, hair caps and aprons which contradicted with this study. She further reported that those who wore these equipment were females which again was contrary to this current study.

It was revealed in a study by Tokuç *et al.* (2009) that meat handlers were aware of the importance of personal hygiene practices but did not implement it because of lack of safety training. The study is similar to this current study where raw meat handlers have not attended food safety training thereby did not implement good hygienic practices. According to World Health Organization (1996), the hand is the principal source of pathogens from the body to food and pathogens like *Salmonella* and *E coli*. can survive at the finger tips. A study conducted by Addison (2015) attested to the fact that all food handlers washed their hands before touching food. The finding is similar to this study where raw meat handlers washed their hands regularly (95.5%), washed their hands with soap before and after touching meat (84%) and (95.5%) respectively.

Results from this study showed that raw meat handlers had poor practices (91%) of food safety with 77% of them not always refreezing meat once defrosted. According to Abdul-Mutalib *et al.* (2012), about 83% of meat handlers were uncertain as whether meat must be refrozen after

thawing or not. This finding was also confirmed in a study by Abdullah & Siow (2014) on the knowledge, attitude and food safety practice of food handlers in Malaysia which further indicated that frequent defrosting makes growth for microorganism favorable.

Only 25.5% of respondent in this study agreed on wounded sore (hand) not coming in contact with meat. This contradicted with a report by Abdullah & Siow (2014) that all (93.2%) meat handlers were conscious of the consequences in touching meat with wounded hand. Also, 99% of meat handlers were found not touching meat with their wounded hand (Angelillo *et al.*, 2000).

Encouraging remarks were obtained from most of the raw meat handlers on the fact that working environment was tidied before work began (97.5%). Smoking was also recognized inappropriate in the workplace (99%) and jewelries must not be worn while handling meat (83%).

5.5 General factors influencing food safety practices

The linear regression revealed that some categories in the socio demographic variables, ages between 31 and 45 years ($p= 0.014$), secondary level of education ($p= 0.002$), owner ($p= 0.015$) and 10 years and above working experience ($p<0.001$) had an influence on food safety practices. A similar study by Nee and Sani (2011) showed a significant relationship between (food handlers aged 31 years and above, and more working experience) and food safety practice. It was further reported in the study that employees had high educational level and translated in their hygiene practices.

5.6 Relationship between knowledge on food safety and food safety practices

Generally, raw meat handlers' knowledge on food safety did not translate in their practices (CI= -0.06731-0.187984; p=0.352). This result was not surprising as it was buttressed and confirmed by Egan *et al.* (2007) that food safety training and education is very important and its most likely to improve the practices of food handlers .

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter presents the conclusion and recommendations from the study to determine the factors associated with food safety practices among raw meat handlers in Turaku Slaughter Slab and Madina market, Accra.

6.2 Conclusion

Only 6% of the raw meat handlers had reasonable knowledge on food safety. This study findings addressed the first objective of assessing the knowledge on food safety among raw meat handlers. Though dissatisfactory results were obtained on the knowledge of foodborne pathogens and high risk groups, raw meat handlers affirmed some responses.

With respect to the second objective, assessing raw meat handler's practices on food safety, the results showed that meat handlers had poor food safety practices (193%). About half of them (56%) sometimes handled meat with sores on their hand and 91% used the same towel to clean at the work place.

The third specific objective that sought to determine the relationship between knowledge and practice revealed an insignificant relationship between knowledge and practice of food safety ($p= 0.325$).

6.3 Recommendations

In order for raw meat handlers to have good food safety practices, the following must be taken into consideration.

- Raw meat handlers should undergo food safety training to make them knowledgeable on food safety practices;
- Regular but unannounced inspections by environmental officers must be conducted to meat facilities to help maintain a sanitary standard among raw meat handlers.
- Owners of meat shops should employ those with long years of working experience as their hygienic practice is better than those with less years of experience.
- Sanctions must be meted out by owners to workers who do not observe food safety rules.

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APPENDICES

APPENDIX I: INFORMED CONSENT FORM

Project title

FACTORS ASSOCIATED WITH FOOD SAFETY PRACTICES AMONG RAW MEAT HANDLERS IN TURAKU SLAUGHTER HOUSE AND MADINA MARKET.

Institutional Affiliation

Department of Biological, Environmental, Occupational Health Sciences (BEOHs), School of Public Health, College of Health Sciences, University of Ghana, Legon.

Background

Dear Participants, my name is Jennifer Naa Oyoe Quartey, a student of the School of Public Health, University of Ghana, Legon, Department of Biological, Environmental, Occupational Health Sciences (BEOHs). The purpose of this study is to determine the factors associated with food safety practices among raw meat handlers in Turaku Slaughter house and Madina market. It further seeks to determine the level of knowledge on food safety practices among the meat handlers which includes their hygienic practices and, the level of food safety practiced. This is entirely an academic project which forms part of my work for the award of a Master of Public Health.

Procedure

The study was a quantitative study and also involved a non-participant observation. A four (4) part structured questionnaire was used take information from participants. Section A (socio-demographic data), Section B (knowledge on food safety), Section C (personal hygiene) and

Section D (general questions on food safety practices) adapted from Angelillo *et al.*, (2000). Participants were observed without their notice based on their practice.

Risk and benefits

This study is not invasive in any way and will not cause discomfort upon participating. However, results gotten from the study will be beneficial to the proper handling of meat and food in general in order to reduce the risk of foodborne diseases.

Right to refuse

Participation to this study is voluntary and participants are at liberty to withdraw from the study at any time. However, I will encourage you to fully participate as your opinions will lead to the effectiveness of the study to us.

Right as a participant

This study is voluntary, however, it has been reviewed and approved by the Ghana Health Service Ethical Review Committee. Any question pertaining your right as a research participant could be directed to the Ethical Review Committee Administrator on 0507041223 (Ms. Hannah Frimpong).

Confidentiality and Anonymity

I would like to inform you that, you will be given the opportunity to ask questions before you decide to take part in the study. If you agree to take part in the study, you will be asked to provide personal information. However, information provided will be handled with strict confidentiality and will be used purely for research purposes. Your responses will not be

shared with anybody who is not part of the study team. Data analysis will be done at the aggregate level to ensure anonymity.

CONSENT FORM

I……...

declare that the purpose and procedures have been explained to me in English language and / or Twi and/ or Ga/ and Ewe and I have understood. I understand that I have the right to withdraw from this study at any point in time without it affecting my job.

I hereby agree to answer the questionnaire provided below

Signature/Thumbprint of volunteer…….

Date ……. / …… / …….

If participants cannot read the form themselves, a witness must sign here

I was present while the benefits, risks and procedures were read to the volunteer. All questions have been answered and the volunteer has agreed to partake in the study.

Name of witness……

Signature/Thumbprint of witness…….

Date ……. / …… / …….

I certify that the nature and purpose, the potential benefits and risks with regards to this research have been elaborately explained to the above individual.

Name of Person Who Obtained Consent……

Signature/Thumbprint of Person Who Obtained Consent witness…….

Date ……. / …… / …….

APPENDIX II

RESEARCH WORK: FACTORS ASSOCIATED WITH FOOD SAFETY PRACTICES AMONG RAW MEAT HANDLERS IN ASHAIMAN AND MADINA MARKETS

QUESTIONNAIRE FOR RAW MEAT HANDLERS

Date: …… Unique ID No.: ……..

Dear respondents,

I, Jennifer Naa Oyoe Quartey seek to determine the factors associated with food safety practices among raw meat handlers in Turaku Slaughter Slab and Madina market. Please indicate your responses by ticking against your preferred choice(s). It is of utmost importance that you give clear and concise responses that would facilitate smooth data analysis. All information provided will be treated as confidential.

SECTION A: **DEMOGRAPHIC INFORMATION**

Please tick (✓) the appropriate responses

Characteristics	
1. Sex	Male [ ] Female [ ]
2. Age	Below 18 [ ] 31-45[ ] 18-30 [ ] 46-60 [ ] Above 60 [ ]
3. Level of education	None[ ] Basic(Primary/JHS) [ ] Secondary(SHS/Vocational/Technical) [ ] Tertiary/(Polytechnic) [ ]

4. Attended any food safety training?	Yes [ ] No [ ]
5. Position at work	Worker [ ] Owner [ ]
6. Working experience	one month - one year [ ] one – five years [ ] six –ten years [ ] ten years and above[ ]

SECTION B: **KNOWLEDGE ON FOOD SAFETY**

The following are statements to ascertain knowledge on food safety. Please indicate your agreement by ticking (✓) in the (Yes) column and disagreement by ticking in the (No) column.

Statements	**Yes**	**No**
7. Food contamination is minimized when hands are washed before work begins		
8. Food contamination is minimized when gloves are used during work		
9. Food contamination increases when one eats and drinks in the work place		
10. Children, adults, pregnant women and old-ages can get food poisoning		
11. Eating meat causes food borne disease		
12. Eating meat can cause AIDS		
13. Meat can cause bloody diarrhea		
14. One can contract typhoid through food		
15. Foodborne disease can induce abortion in pregnant women		

16. Taking a sick leave is necessary when you have a skin disease		
17. Freezer temperature is very important in the storage of meat		
18. Other food items like vegetables can be stored together with meat in the freezer		
19. It's necessary to allow meat to thaw before cutting		
Foodborne pathogens may include: (16-20)		
20. Salmonella		
21. Hepatitis A virus		
22. Hepatitis B virus		
23. Staphylococcus pathogens		
24. Clostridium botulinum		

SECTION C: **PERSONAL HYGIENE**

Please indicate your agreement (Yes) and disagreement (No) in each

Questions	**Yes**	**No**
25. Do you use gloves while working?		
26. Do you wash your hands before using gloves?		
27. Do you wear an apron during work?		
28. Do you use a nose mask during work?		
29. Do you wear cap during work?		
30. Do you wash your hands regularly?		

31. Do you wash your hands with soap before you touch raw meat?		
32. Do you wash your hands with soap after you touch raw meat?		
33. Is smoking allowed in your work place?		

SECTION D: **PRACTICE**

The statements below is to determine practices on food safety. Please indicate your response by ticking appropriately.

Statements	**Disagree**	**Uncertain**	**Agree**
34. Working environment must be tidied in advance			
35. Hands must be washed before work starts			
36. Working with unclean hands must be avoided			
37. Mouth and nose is covered when coughing or sneezing			
38. Hands can be cleaned with an apron			
39. Smoking while working is inappropriate			
40. Rubbing hands on face and hair while working isn't appropriate			
41. Wedding ring and a watch can be worn while handling meat			
42. Many places can be cleaned with the same towel			
43. Defrosted meat should not be re-frozen			
44. Meat should not be come into contact with wounded (sore) hand.			

-- Thank you for participating --