UNIVERSITY OF CAPE COAST

CONSTRAINTS TO PRODUCTION, DISTRIBUTION AND CONSUMPTION OF LOCALLY PROCESSED POULTRY MEAT IN THE GREATER ACCRA REGION OF GHANA

RICHARD TAKYI-MENSAH

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BY

RICHARD TAKYI-MENSAH

THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION OF THE SCHOOL OF AGRICULTURE, UNIVERSITY OF CAPE COAST IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR AWARD OF MASTER OF PHILOSOPHY DEGREE IN AGRICULTURAL ECONOMICS

MAY 2012

DECLARATION

Candidate's Declaration

I, hereby, declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:_____ Date: _____

Name: Richard Takyi-Mensah

Supervisors' Declaration

We, hereby, declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:_____ Date: _____

Name: Mr Ernest G. Asante

Co-Supervisor's Signature:_____ Date: _____

Name: Dr. Simon Cudjoe Fialor

ABSTRACT

The study set out to examine in terms of severity, the constraints to production, distribution and consumption of locally processed poultry meat. A multi-stage sampling technique was used where simple random was used to select the farmers and snow-ball used to select the consumers and sellers. This summed up to 36 poultry farmers, 72 poultry meat sellers and 108 poultry meat consumers, making a total of 216 respondents for the study. Linear multiple regression model and Ordinary Least Square technique were used to estimate supply and demand for locally processed poultry meat. Kendall's Coefficient of Concordance was also used to rank the constraints in order of severity.

Disease outbreaks, relative high price of locally processed poultry meat and high average cost of inputs impacted significantly in the supply of locally processed poultry meat. In descending order of severity, high average cost of inputs and low tariffs on imported poultry meat were constraints to production. Price of locally processed poultry meat, income of consumers, proportion of consumer's income spent on poultry meat and cultural consideration were significant in the demand for locally processed poultry meat.

In decreasing order of severity, relative higher prices of locally processed poultry meat and relative cheaper prices of imported processed poultry meat constrained consumption. Poultry farmers, sellers and consumers agreed to the order of severity of the constraints. The Ministry of Trade and Industry should consider imposition of heavy tariffs on imported processed poultry meat and also poultry farmers should adopt more efficient technology in production.

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DEDICATION

To Dr. Simon Cudjoe Fialor and my wife-to-be, Miss Comfort Ampah

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LIST OF ACRONYMS

AI	Avian Influenza
CEPS	Customs, Excise and Preventive Services
DFID	Department of International Development
ECOWASS	Economic Community of West African States
FAPRI	Food and Agricultural Policy Research Institute
FAOSTAT	Food and Agriculture Organization Statistical Database
FASDEP	Food and Agriculture Sector Development Project
FSIS	Food Safety Inspection Services
GAIN	Global Agriculture Information Network
GAPFA	Greater Accra Poultry Farmers Association
GDP	Gross Domestic Products
GNAPF	Ghana National Association of Poultry Farmers
GNP	Gross National Product
GOG	Government of Ghana
GSS	Ghana Statistical Service
HPAI	Highly Pathogenic Avian Influenza
ISO	International Standards Organization
ISODEC	Integrated Social Development Centre

LDCs	Least Developed Countries
LMIC	Livestock Marketing Information Centre
LPIU	Livestock Planning and Information Unit
MDGs	Millennium Development Goals
MDPM	Mechanically Deboned Poultry Meat
MOFA	Ministry of Food and Agriculture of Ghana
MOTI	Ministry of Trade and Industry of Ghana
NCCE	National Commission for Civic Education
NHIL	National Health Insurance Levy
NGOs	Non-Governmental Organizations
OECD	Organization for Economic Corporation and Development
OLFA	Oyarifa Livestock Farmers Association
OLS	Ordinary Least Square
SPSS	Statistical Product and Service Solution
SRID	Statistics, Research and Information Division of Ghana's Ministry of Agriculture
SSNIT	Social Security and National Insurance Trust
TMLPFA	Tema Metropolitan Livestock and Poultry Farmers Association
UNIDO	United Nations Industrial Development Organization
USDA	United States Department of Agriculture

VAT	Value Added Tax
VSD	Veterinary Service Directorate
WPS	World’s Poultry Science

CHAPTER ONE

INTRODUCTION

Background to the Study

To alleviate poverty and to achieve the Millennium Development Goals (MDGs), African countries need to accelerate their per capita growth. It is widely accepted that industrial development and trade are important engines of growth since domestic African markets are too constrained for adequate industrial expansion and they require access to global markets if vital increases in employment and income levels are to be achieved (UNIDO, 2006). Agriculture is still the mainstay of Ghana's economy, and about 40% of the GDP is accounted for by agriculture and livestock, forestry, fishing and about 50% of the employment is dependent on agriculture; the majority of the people engaged in agricultural production are small-scale farmers involved in subsistence agriculture; about 80% of agricultural production is from smallholder family-operated farms, mainly below one hectare (African Development Bank, 2010).

Since the 1970s, global production, consumption and trade of poultry meat have grown faster than that of any other meat. During the 1990s, when demand growth slowed for other meats, including fish, demand growth for poultry meat accelerated and poultry continued to lead the expansion of meat trade (Barbut, 2002). Per capita consumption of poultry meat varies around the

world, ranging from 0.7 kg in India to 44 kg per annum in the US (Bilgili, 2002). With a population of more than 20 million and an increasing real per capita income, Ghana constitutes a potential market for poultry meat (Kudzodzi, 2008).

Agricultural Processing and its Contribution to Economic Development

Agricultural processing is defined as the horizontal set of activities engaged exclusively in the production of processed products from the processing of agricultural raw materials. Many economists believe the agricultural processing sector constitutes an important thrust for development in LDCs for the different accomplishments that it can bring about, such as: (1) increasing GDP through the provision of additional goods and new processed products in the country; (2) providing income and employment in rural areas, because of their strong backward linkage to primary agriculture, thus reducing uneven income distribution and diminishing ongoing rural-urban migration problems; (3) creating a source of exports and foreign exchange; (4) providing training to unskilled new employees, as well as fringe benefits, thus upgrading the level of education and living standards prevailing in underdeveloped areas; and (5) stimulating agricultural production by creating new stable intermediate markets for raw agricultural products and assisting producers in improving their farming know-how in some processing activities through vertical integration and production contracts with processors (Ricardo,2004). Another very important characteristic of processing industries is its strong relationship with

other important sectors of the economy, like the grocery and wholesale sectors, that create thousands of jobs, as well as with the service sector and the growing tourist industry, that bring about a vigorous expanding demand for food processed products. (Ricardo, 2004).

Problem Statement

Poultry meat is the most popular source of non-vegetarian protein in Ghana as a result of lower price, perceived safety and health advantages compared to other meat sources. Though Ghana's demand for poultry products has increased tremendously over the years, the local poultry industry has not been well positioned to meet the rising demand for poultry products in the country. Traders go to poultry farms to purchase birds in bulk for further retailing. They usually sell these birds live on the open market. Some producers also sell live birds at the farm-gate (Aning, 2006).

According to GOG sources, broiler production has experienced a steep decline from 80 percent of the market supply in 2000 to 10 percent in 2010. Asuming-Brempong, Osei-Asare & Anim-Somuah (2006), states that "a critical look at the chicken meat types consumed in Ghana provides evidence of consumption turning towards chicken parts than a whole chicken". The reasons for this trend are that it is cheaper than locally produced poultry and it is already pre-cut, into portions such as leg quarters, wings and processed whole chicken and gizzards. As such, the convenience of a ready-to-use chicken product has boosted consumer demand for imported poultry meat. In Ghana local processing

of poultry into cut portions to facilitate quick and easy use by consumers is limited (GAIN Report, 2011).

In every business enterprise, it is always said that production is not ended until the products have reached the final consumer. This clearly underscores the fact that merely producing processed poultry meat is simply not enough because distribution is needed to make the cycle complete and also the products need to be consumed for production to go on. In order to stay competitive, the poultry industry must process more of its products and distribute them to satisfy emerging consumer demands. To achieve this, the constraints militating against the production, distribution and consumption of locally processed poultry meat and also factors impacting on supply and demand for locally processed poultry meat need to be examined so that possible practical measures could be put in place to holistically address these constraints to boost the local poultry industry in the country.

Objectives of the Study

Main Objective

The main objective of this study was to examine in order of severity the constraints militating against the production, distribution and consumption of locally processed poultry meat in the Greater Accra region of Ghana.

Specific Objectives

This study, specifically aims to:

(a) estimate monthly demand for locally processed poultry meat within the Greater Accra Region

(b) estimate monthly supply for locally processed poultry meat within the Greater Accra Region

(c) rank in order of severity, constraints hindering the production of locally processed poultry meat by commercial poultry farmers in the Greater Accra Region of Ghana

(d) rank in order of severity, constraints militating against the consumption of locally processed poultry meat in the Greater Accra Region of Ghana.

(e) rank in order of severity, constraints hindering the distribution of locally processed poultry meat in Greater Accra Region of Ghana.

Research Questions

In order to achieve the objectives set out for the study, the following research questions were posed;

a) What is the estimate for the monthly demand of locally processed poultry meat in the Greater Accra Region?

b) What is the estimate for the monthly supply of locally processed poultry meat in the Greater Accra Region?

c) In order of severity what are the constraints hindering the production of locally processed poultry meat by commercial poultry farmers in the Greater Accra Region?

d) In order of severity what are the constraints militating against the consumption of locally processed poultry meat in the Greater Accra Region?

e) In order of severity what are the constraints hindering the distribution of locally processed poultry meat in the Greater Accra Region?

Hypotheses

The following statistical hypotheses were tested:

1. H_o: There is no agreement in the order of rankings of the severity of the constraints to the production of locally processed poultry meat by all poultry farmers within the Greater Accra Region.

2. H_o: There is no agreement in the order of rankings of the severity of the constraints affecting the distribution of locally processed poultry meat by all poultry meat sellers within the Greater Accra Region.

3. H_o: There is no agreement as to the order of rankings of the severity of the constraints affecting the consumption of locally processed poultry meat by all poultry meat consumers within the Greater Accra Region

Significance of the Study

Economic opportunities for poultry meat production are present in most developing countries such as Ghana. Recent reports (for instance OECD/FAO,

2006) on the future of chicken meat consumption indicate that developed countries such as the United States, United Kingdom, Holland and France will continue to be important import markets. This paints brighter future prospects for the poultry industry in countries like Ghana.

Poultry meat, which used to have a highly seasonal demand pattern, is now in constant demand throughout the year. The change in demand for chicken, paradoxically, has not been entirely to the benefit of the local poultry industry. For some time now, the Ghanaian market has witnessed an influx of cheap, frozen poultry products from Europe, South America and other parts of the world. For the local poultry industry to stay competitive, the poultry meat should be processed to meet consumer preferences. Therefore, this study sought to identify in terms of severity the factors constraining the supply, distribution and demand of locally processed poultry meat in the Greater Accra region of Ghana.

Technical publications that will come out of this study will be made available to the poultry industry policy makers, MOFA, universities and other institutions promoting value-added agriculture to inform decisions that seek to improve the poultry industry in Ghana.

Limitations of the Study

Most commercial poultry farmers hardly keep proper records on their poultry farming business and few sellers of poultry meat keep records on sales of poultry meat so the researcher relied on the respondents' power to recall and

or perceptions to obtain some of the data required for the study. Thus inferences from the findings of the study may reflect the views of processors of poultry meat, and consumers of poultry meat in the Greater Accra region but not the entire country.

Delimitations of the Study

In analyzing factors that affect the demand for locally processed poultry meat in the Greater Accra region, this study focused on 12 factors though there may be other factors that affect the demand for locally processed poultry meat. It is in the same vein that this research delimits itself to ten (10) factors that determine the supply of locally processed poultry meat by commercial poultry farmers in the Greater Accra region though there might be other factors that affect the supply of locally processed meat by commercial poultry farmers in the Greater Accra region.

Organization of the Study

This thesis is organized into five main chapters. Chapter One entails discussions of sections that make up the introductory chapter. Chapter Two deals with the review of both theoretical and empirical literature which are relevant to the study. In Chapter Three, the methodology employed in the study is discussed. Chapter Four presents analysis and discussion of results. The summary of the study, conclusions drawn from the study results as well as policy recommendations based on the conclusions are presented in Chapter Five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Overview

In this chapter, relevant theoretical literature, which were found relevant to the subject, have been reviewed and discussed.

Importance of Poultry Meat Production and the Increasing Poultry Meat Demand

The importance of poultry production to the biological needs, economic and social development of the people in any nation cannot be overemphasized. Oluyemi & Roberts (1979) claimed that poultry production in warm climate countries has a high priority rating compared with other types of livestock because poultry has better energy and protein conversion ratio and that net return on investment is relatively high. Apart from these, poultry product, most especially eggs and meat (broilers), is good sources of animal protein. Poultry production has been identified as a means of ensuring sustainable family income. Poultry can be established with minimum capital and as a side project (Sani., Tailor & Kushawa, 2000). Moreover, they can fend for themselves on free range without much care (Umeh & Odo, 2002). Poultry production also contributes to a nation's Gross Domestic Product (GDP) as it provides gainful employment and income for a sizeable proportion of the population (Adewumi, Ayodele & Lameed, 2008).

From 1970 to now, worldwide meat production has witnessed an annual growth of 2.8% (Lubchenco, 2003), with poultry and pig production growing at a double level than ruminants. Meat production is increased to fulfil the demand of developing countries. Demand is increasing and this has to be satisfied, being also a good opportunity for developing countries to participate in the lucrative international market, enhance economic growth and reduce hunger and poverty (Rivera-Ferre, 2009)

A widely accepted theory to explain the consumer behaviour with respect to the increasing demand of meat is that urbanisation changes the lifestyle and the dietary habits (Popkins, 1999). These changes in the diet are related to changes in the economic structure that shifts from a preindustrial agrarian economy to industrialisation, where afterwards the services sector increase rapidly and industrial production is dominated by capital-intensive processes (Popkins, 1999). This is the argument selected by the followers of the livestock revolution to support the present increasing consumption of meat: the economic growth. Steinfeld (2004) indicated that rapid increases in livestock production are the result of population growth, urbanization, changes in life styles and dietary habits, and increasing disposable incomes. The total demand for animal products in the developing countries is expected to more than double by 2030. Speedy in 2003 associated meat consumption with wealth. Lubchenco (2003) claimed that the increasing demand in developed countries is driven by increased consumer awareness of the health and nutrition benefits of poultry meat, increased standardization and availability of products and cheaper prices.

To a large extent, the increasing quality of life and urbanisation leads us to believe that consumers look for better quality products in order to improve the diet. According to Entrena (1999), once the basic needs are satisfied, food consumption is shifted to be experienced with a symbolic meaning, even as a hedonism action. However, this is not always so. A study performed in Spain showed that the number of consumers preferring quality products, whether with protected designation of origin or other quality certifications, is higher in the rural areas than in the urban ones (Moreno & Esparcia, 2000) and the main reason wielded is the price. Thus, for the urban consumer the price is an important shopping decision factor, while for the rural consumer the quality is more important. Probably, the ignorance about how food is produced and the disengagement with the rural areas limit urban consumers' decision capacity. Also, the unawareness of the social, environmental and health impacts of their food consumption may have some relevance.

In the opinion of Rivera-Ferre (2009), price has been in fact the most important factor favouring the increasing consumption of meat in developing countries and developed ones. A deep analysis of the evolution of meat with the time shows that prices have not increased with the level of life, but on the contrary have decreased or have remained the same (which implies a relative decrease of the net value). In that manner, increasing meat consumption is more a supply-driven process. Steinfeld (2003) pointed out a possibility suggesting that looking at price trends of the major livestock products; it could be assumed that the Livestock Revolution is as much supply driven as demand driven.

According to him, prices for livestock products have generally declined more than prices for food or feed grains, and the massive spread of improved technology in the intensive subsector has triggered vast efficiency gains. However, he just mentions this possibility, but he does not delve deep into it and ends defending the 'consumer-focused market'.

In the case of meat, the price of the grain used for animal feed is determinant in the final price. The price of these grains has fallen during the last few years or has remained the same. Animal feed is the higher cost in intensive animal production. In the case of poultry it can be up to 70% of direct costs (Walkery & Gordon, 2003). In developing countries, 31 % of cereals and 59 % of roots and tubers are used as animal feed (Gill, 1999) and worldwide more than 40% of the production of these types of grain is for animal feed. If soy, maize or wheat reduces their price in the international market, then meat price goes down. However, this trend can change in the near future due to the big push is being given for the production of bio- fuels. It is expected that the price of these grains will increase and this will have serious implications in the price of the meat, which can result in a reduction of the consumption.

In 2007, Ghana's balance of trade was negative, with domestic production accounting for only about 42 percent of consumption, as shown in Figure 1. This share had declined from 72 percent of consumption in 2000. The country produced 1.27 kg of chicken meat per capita in 2008, lower than the per capita average of 1.71 kg for all of West Africa. Per capita chicken meat and egg production has remained fairly steady since 2004(FAO, 2009). Poultry

production in Ghana includes local and exotic breeds of chicken, turkey, Guinea fowl, duck, quail, pigeon, and ostrich (Aning, 2006)

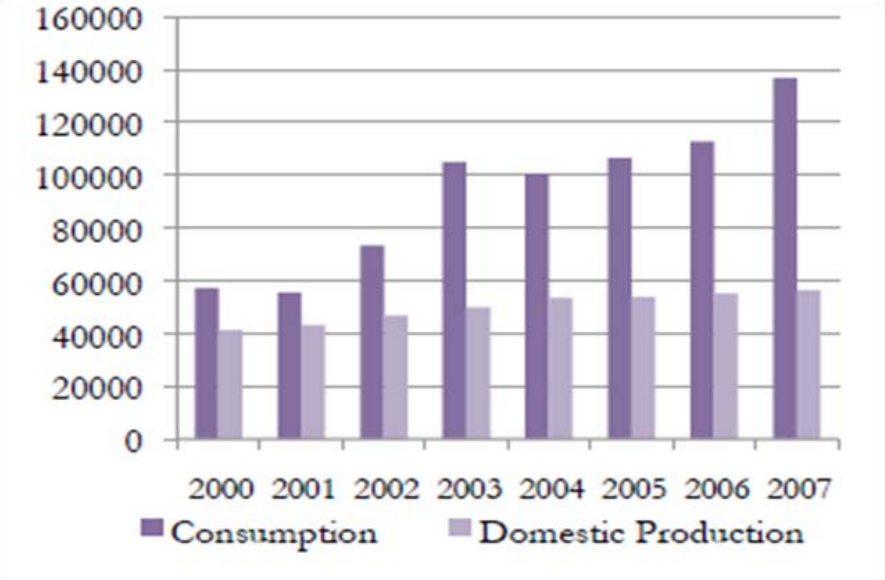

Figure 1: Domestic Poultry Production and Consumption in Ghana (Tonnes)
Source: Killebrew & Plotnick (2010).Computed from FAOSTAT Source

Local chicken breeds raised in rural areas account for 60 to80 percent of the country's total poultry population (Aning, 2006). Almost all rural households raise local chicken breeds as a source of meat, eggs, and emergency cash. Local breeds of Guinea fowl are also kept in rural areas, particularly in the country's poorer northern regions (Aning, 2006).

Commercial poultry operations are found mostly in the urban areas of Greater Accra and Ashanti administrative regions. Three hundred and eighty large-scale operations exist in the country, each with stocks of over 10,000 birds. Most large-scale operations are egg producers, with some raising exotic breeds of broiler chickens, Guinea fowl, and turkeys for meat. These operations

manage their own feed mills. Some maintain hatcheries and parent stocks. Almost 1,000 small- to medium-scale (50 to 10,000 birds) facilities operate in the country. They rely on external suppliers for day-old chicks and feed. Most commercial producers have adequate access to public or private veterinary services (Aning, 2006).

Seven hatcheries, four in Ashanti, two in Greater Accra, and one in the Eastern region, produce day-old chicks and Guinea fowl kept for commercial production. All but three of the facilities rely on imported fertile eggs. The country has 12 feed milling companies (Aning, 2006). All hatcheries and feed mills operate below capacity due to limited demand, at about 25 percent and 42 percent of capacity respectively (Dieye, Duteurtre, Cuzon & Dia, 2004).

Poultry Processing and Products

Development of new and efficient processing systems, adoption of advanced technologies, and introduction of novel products that meet the market chain requirements and end-consumer needs have contributed significantly to the increases in global poultry meat consumption (Roenigk, 1998). Poultry production and processing technologies have become readily accessible, and implemented on a worldwide basis, and hence, will allow continued expansion and competitiveness in the poultry meat sector (Aho, 2001). Processing and marketing of poultry ranges from live bird markets or a very primitive onsite slaughter and sale, to a highly sophisticated, fully automated and International Standards Organization (ISO) certified facilities and ready-to eat convenience

products, in many parts of the world. Ironically, sometimes these extremes in processing and marketing methods are observed within the same country. Lack of or inadequate refrigeration is probably the single largest obstacle to the marketing of many perishable foods, including meat and poultry. In many developing countries, even the subtle improvements in the cold storage capabilities have significantly increased the trade, storage, distribution, and consumption of poultry products, whether domestic or imported (Babji, 2001).

On the other hand, the adoption of modern freezing, packaging, and transportation technologies has provided large poultry companies the flexibility to export their high quality, mostly value-added premium cuts to all corners of the world, especially at times of domestic surpluses and low market demands. However, as the global poultry market expands, differences in labor and freight costs and tariffs may alter the competitive advantages of traditional poultry exporters. Although whole birds, with or without giblets, and cut-up parts dominate the market forms of poultry in many parts of the world, there has been a global shift to "well-differentiated, name-branded" poultry products in the marketplace (Keeton, 1997). Whole bird and tray-pack markets, domestic or international, usually demand high quality (A Grade) product. High market share of whole birds in Middle East, South America and Eastern Europe directly relates to consumer preference for traditional meat preparation methods and chicken broth, and expanding roasting or rotisserie markets. Religious and cultural practices have always been important considerations for poultry products, especially in export markets, as many countries have strict

requirements (laws) for slaughter and processing of poultry (Regenstein & Chaudry, 2001).

Historically, introduction of many novel poultry products into the market of developed countries was an attempt to find outlets for trimmings, low-value cuts, and parts from fabrication of whole birds. Later, expansion of food service and fast-food chains, increasing demand for finger-foods, availability of mechanically deboned poultry meat (MDPM) for frankfurters and luncheon meats, and development of marination/injection technologies have all contributed to the product diversification at the retail level. Most of these value-added products, formulated primarily to suit the local palate, not only target the changing needs of consumers (i.e., convenience, nutrition, health, quality, variety, shelf-life), but also allows a marketing edge over imports (Bilgili, 1999). As we move into a global market economy, poultry production will continue to increase in those countries that have the natural resources, economically competitive and politically open to business investments. Many countries or regions, on the other hand, will continue to struggle to compete in this market, either because of limited infrastructure (raw materials, land, utilities, labor, transportation) or political constraints (environmental and welfare concerns, tax structure, trade policies) (Aho, 2001).

Profile of the Ghanaian Poultry Industry

The Ghanaian economy is based largely on agriculture, which accounts for 41% of Gross National Product (GNP). About 60% of the labour force is engaged in this sector, most operating a crop farm or mixed crop and livestock /poultry farming. According to a recent survey (MOFA/DFID, 2002) the livestock/poultry component serves as a 'safety net', providing an important source of ready cash for emergency needs. Thus even though livestock and poultry contributes only 7% to the agricultural GNP (FASDEP, 2002), their role in rural livelihoods and food security is enormous.

The poultry industry in Ghana is an important industry given its contribution to the national strategies for feeding and nutrition and for entrepreneurship. There are a number of small and medium enterprises operating in the sector as well as traditional and modern entrepreneurs. It is important also as an avenue for entrepreneurship and employment. Small scale farmers are able to keep a few hundreds of birds and supply the market with eggs and poultry meat. It is estimated that village chickens account for about 60-80% of the poultry population. (Aning , 2006) . Gyening (2006) & Aning (2006) estimate the rural poultry population to exceed 25 million.

Commercial poultry production in Ghana grew rapidly during the 1980-1990s, developing into a vibrant sector that supplied about 80 percent of the available chicken meat and eggs in the country. The development of the commercial poultry industry was initially slow, due to the irregular supply of imported day-old chicks, a lack of veterinary drugs, and frequent outbreaks of

poultry diseases. In order to increase growth, the Government of Ghana (GOG) removed customs duties on poultry inputs (feed, additives, drugs and vaccines) and improved access to veterinary services.

According to GOG's Ministries of Agriculture and Trade and Industry, broiler production has experienced a steep decline from 80 percent of the market supply 2000 to 10 percent in 2010. This downward trend is due primarily to a very high cost of production (feed, drugs,). Other constraints include the high energy prices which have pulled up production costs by over 60 percent. By 2005, commercial domestic poultry production was only able to meet 34 percent of total demand as most poultry producers shifted from producing broilers for meat to the production of eggs. Both GOG and industry sources have indicated that poultry meat (broiler) production for 2009/2010 fell to below 10 percent of the demand. Most of the small and medium-scale producers completely shut down. In Ghana, local processing of poultry into cut portions to facilitate quick and easy use by consumers is limited. Imported poultry products tend to be 30-40 percent cheaper than locally produced chicken. Ghana's current poultry layer count stands at 21 million birds while broilers are at 5 million (GAIN Report, 2011).

Poultry Meat Production and Population in Ghana

The official document of MOFA (FASDEP, 2002) estimates the annual poultry production to be 14,000MT of meat. Table 1 gives figures of poultry

meat production, import and demand as compiled by the Food and Agriculture Organization.

Table 1: Poultry Meat Demand and Supply in Ghana (x 1000 tonnes)

Year	Meat(chicken, turkey, guinea fowl, etc)			
	Production	Export	Import	Demand
2001	20.96	0	12.26	33.22
2002	23.40	0.79	27.30	49.91
2003	25.55	0.79	38.18	62.94
2004	28.27	0.39	48.0	75.88

Source: FAOSTAT, 2006

The production figures presented in Table 1 are based on projected poultry populations and actual import figures presented by VSD and MOFA.

Projections of poultry populations in each one of the administrative regions are reported in Table 2.

Table 2: Poultry Populations and Distribution in Ghana

Administrative Regions	Census				Projections		
	1995	**1996**	**2001**	**2002**	**2003**	**2004**	**2005**
Greater Accra	4,179,458	5,341,120	10,160,174	11,729,071	13,540,230	15,631,062	18,044,753
Central	676,089	684,778	939,391	871,023	903,308	936,790	971,514
Western	247,377	304,110	380,039	401,405	423,971	447,806	472,982
Eastern	747,496	826,940	1,223,531	1,328,907	1,443,358	1,567,665	1,702,679
Volta	1,160,028	970,845	1,192,775	1,206,122	1,219,619	1,233,267	1,247,067
Ashanti	2,103,541	2,286,841	3,880,693	4,290,010	4,742,500	5,242,716	5,795,693
Brong Ahafo	863,630	797,146	1,571,243	1,765,314	1,983,356	2,228,328	2,503,559
Northern	1,468,320	1,559,865	1,749,368	1,792,610	1,836,921	1,882,328	1,928,856
Upper East	888,475	811,925	763,276	747,563	732,174	717,101	702,339
Upper West	912,898	1,005,736	968,151	983,429	998,949	1,014,713	1,030,727
Total	13,082,557	14,589,306	22,828,641	25,115,454	27,824,386	30,901,776	33,525,809

Source: Aning (2006). Computed from Livestock Planning and Information Data, MOFA

Table 3: Local Poultry Meat Production and Imports

Year	Potential sources of poultry meat(tones)			% of total meat supply
	Domestic [1]	Imported [2]	Total	
2001	26,554	30,261	56,815	17.9
2002	28,962	19,986	48,947	15.2
2003	31,369	27,798	59,166	18.1
2004	33,776	39,089	72,864	22.0
2005	36,184	42,288	78,472	23.4

Note: 1-Estimated 2- Actual
Source: Aning (2006)

With a projected national poultry population of 33,525,869 in 2005 as depicted by Table 2, it was estimated that a total of 36,184MT of poultry meat was produced in that year according to Table 3.Table 4 depicts quantities of poultry meat produced domestically from 1999 -2010 in metric tons and Table 5 depicts the import quantities of poultry meat into Ghana from the year 2000 – 2007.

Table 4: Domestic Poultry Meat Production, 1999-2010(Metric Tons)

Year	Production(Metric Tones)
1999	14,534
2000	13,807
2001	14,580
2002	19,401
2003	21,116
2004	22,982
2005	22,709
2007	29,630
2006	27,224
2008	31,853
2009	34,656
2010	38,202

Source: SRID- MOFA, 2011.

Table 5: Imports of Chicken Meat to Ghana

Year	Imports(metric tones)
2000	9,548.0
2001	6,807.6
2002	20,752.3
2003	34,107.6
2004	40,357.3
2005	42,288.2
2006	47,794.1
2007	66,791.0
2008	93,257.8
2009	69,079.6
2010	72,418.1

Source: SRID- MOFA, 2011

Poultry Meat Consumption in Ghana

Poultry consumption in Ghana has continued to rise and Post forecasts Ghana's total poultry consumption for May, 2011 at approximately 115,000 MT, up from 108,000 MT in May 2010. Poultry meat imports to Ghana in 2010 accounted for nearly 90 percent of consumption while the domestic production of all types including commercial and non-commercial or backyard poultry production provided only about 10 percent. Ghanaians consume mostly chicken, but also consume guinea fowl, duck, turkey and ostrich. The estimated per capita consumption of poultry products in Ghana is increasing, from 3.5kg meat in 2003 to 4kg in 2010 (MOFA 2010 fact sheet). In Ghana, livestock and poultry meat contributes 40 percent of the national animal protein supply with the rest coming from fish (FAO report, 2010).

Consumption patterns of households in urban areas in Ghana are heavily weighted towards imported frozen poultry products. The reasons for this trend are that it is cheaper than locally produced poultry and it is already pre-cut, such as leg quarters and wings, and processed whole chicken and gizzards. As such, the convenience of a ready-to-use chicken product has boosted consumer demand. Furthermore, the rapid growth in the restaurant, hotel and fast food sector has increased demand for frozen poultry products in the past few years.

Consumption of chicken and eggs continues to increase, despite the significantly higher prices. The price of a kilo of imported chicken leg quarters is currently GH¢3.50- GH¢4.50 ($2.33-$3) compared to GH¢2.7-GH¢3.00 ($1.8-$2) this time last year. The wholesale price of a crate of eggs (30 eggs per

crate) in 2011 is GH¢ 6.50-GH¢ 8.00 ($4.33-$5.33), up from GH¢ 4.00-5.50 ($2.67-$3.67) in 2010.

Demand and Supply of Poultry Products

Commercial poultry production takes place largely in and around urban centres where the markets exist. There is rapid urbanization in the country. The urban population increased from 43.8% in 2000 to 50.9 % in 2010, according to 2010 census data. It is expected that poultry meat and egg demand, especially the latter will continue to increase. Increased peri-urban poultry production has been identified as a means to meeting the anticipated increased demands and also creating wealth (Okantah, Aboe,, Boa-Amponsem, Dorward & Bryant, 2003).

Effects of Importation on Local Production

It is generally known that the unrestricted importation from Europe and America of heavily subsidized poultry meat which sell cheaper on the local market as presented in Table 6 has contributed immensely to the depression of broiler bird production in Ghana. Most poultry operations therefore, are for eggs and some large scale farms have shut down their broiler operations for this reason.

Table 6: Comparing Average Market Prices of Locally-produced and Imported Poultry Meat (GH¢ x 100/Kg)

Year	Local [1]	Imported [2]
2001	15.0	13.0
2002	17.0	12.5 -13.5
2003	15.5	14.5 – 15.0
2004	21.0	14.5 – 19.5
2005	21.0	16.0

Source: Aning et al (2008). Computed from:1- ARI Technical Report, 2- LPIU data.

Trade Flows

Imports of poultry products worldwide have increased almost 400 percent since 2000, growing at an annual average rate of 57 percent. Most imported meat comes in the form of frozen chicken or turkey legs, wings, and other cut-portion by-products from the European Union. Egg imports are minor and offer little competition to the local market. There are the top four types, in terms of quantity, of poultry products imported from the EU. Imports of the category "frozen chicken backs, necks, rumps, and wingtips" have increased 476 percent since 2000. (Killebrew & Plotnick, 2010).

Imported poultry is generally offered at prices 30 to 40 percent cheaper than domestically produced birds (Aning, 2006). The Ghanaian government maintains that imports are necessary to conform to international trade rules and to give the population access to cheaper sources of protein. Low-quality roads

make transporting foods difficult and more expensive, suggesting that fewer poultry imports are sold in the poorer northern regions farther from coastal ports (FAO, 2009).

Employment Opportunities in the Poultry Sector

There is no information on the number of people employed in the poultry sector. Village poultry rearing is not the main occupation of farmers, although it provides substantial support to rural households (Aboe, Boa-Amponsem, Okantah, Butler, Dorward & Bryant, 2006b). 66% of the 3.7 million households living in rural Ghana keep village poultry. Therefore, it can be assumed that nearly 2.5 million households benefit from village poultry production. The number of commercial poultry workers, as estimated from the commercial farms with official records (table below) is about 7000 (Aning, Turkson & Asuming-Brempong, 2008).

Linkages between Poultry Sub-sector and other Industries

In addition to labour, the main inputs to the poultry sub-sector are day old chicks, feed as well as drugs and vaccines. Day old chicks are sourced from the hatcheries of the large-scale farms or from commercial importers. Commercial poultry production in Ghana relies heavily on local maize production, and is supplemented with yellow maize imports. Wheat bran is an important feed ingredient and it is supplied as a by-product of wheat flour milling by four factories in the country. The cost of production of maize in Ghana has increased steadily from ¢139,390 in 1994 to about ¢2,000,000 per

tonne in 2005 (refer to Table 7). Undoubtedly, this has contributed to the escalating cost of commercial poultry production.

Table 7: Producer Price of Maize in Ghana (1994 – 2005)

Year	Producer Price (Cedis/ton)
1994	139,390
1995	258,190
1996	317,920
19997	666,660
19998	559,051
1999	361,244
2000	749,304
20001	1,201,304
2002	1,073,344
2003	1,497,000
2004	1,824,946
2005	1,992,989

Source: Aning et al (2008).Computed from FAOSTAT Sources.

Other feed ingredients such as fishmeal, soya bean cake and vitamin-mineral premix are imported, as are poultry drugs and vaccines. Medium and small-scale commercial farms rely on feed milling companies.

There has been a modest annual increase in feed production over the period of 2001 -2005 in the Greater Accra region, however feed millers have stated that their production would have increased had poultry production increased,(Aning et al., 2008).

Structure of the Poultry Sector

Poultry production in Ghana may be classified into three categories according to installed capacity, marketing system and level of integration of its operations. These are commercial (or industrial), semi-commercial and backyard producers. The FAO classification, in addition to the above criteria, includes the level of biosecurity (Aning, 2006).

According to the FAO classification (1-4) (see Aning, 2006), Sector 1 (industrial and integrated) has a high biosecurity level, with clearly defined and implemented standard operating procedures for biosecurity. The operations are part of an integrated enterprise.

Sector 2 (commercial) supports a moderate to high biosecurity level; birds are kept indoors continuously and prevented from coming into contact with other poultry or wildlife.

Sector 3 (commercial) has low to minimal biosecurity, where birds are kept in open sheds and may even spend time outside these sheds. Birds/products may be sold at the live markets.

Finally, Sector 4 (Village and backyard) is characterized by minimal biosecurity and birds and their products are consumed locally .Poultry farms in Ghana operate their own biosecurity (cleaning/disinfection) standards, which are set according to farmers' experience, although veterinary authorities also provide advice. With the exception of imposed bans on movement during the HPAI outbreaks in Ghana in 2007, poultry farmers are not restricted by movement and transportation regulations.

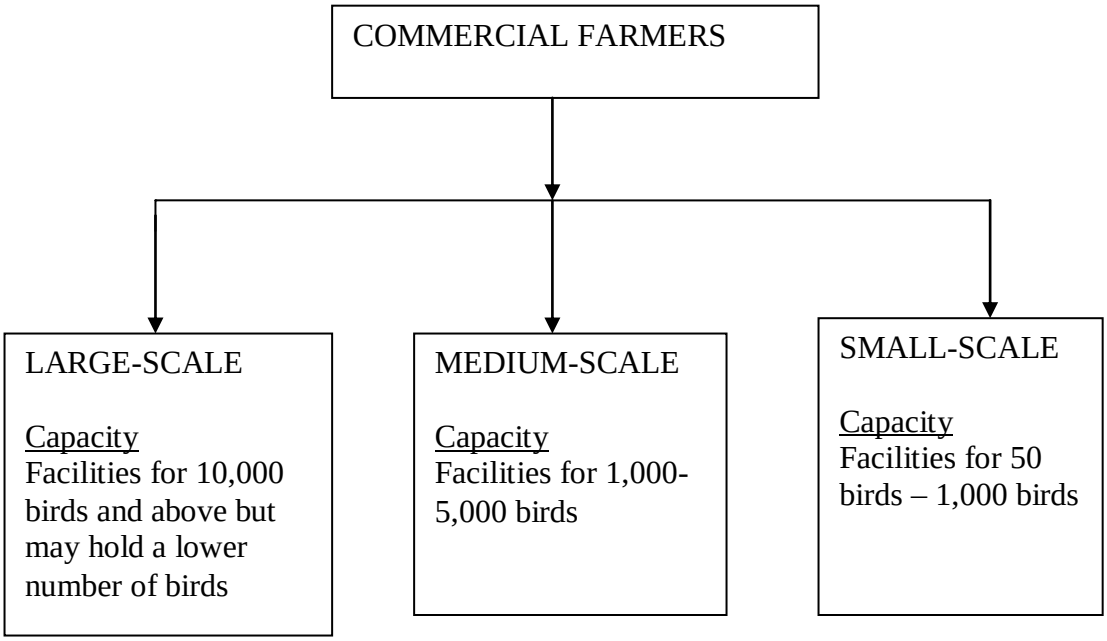

Figure 2: The Scale of Production of Commercial Poultry Industry in Ghana
Source: Aning et al (2008). Computed from GNAPF Sources.

Commercial (Industrial) System

Although there are a few large-scale commercial farms in Ghana, which are integrated with hatchery, production, feed mill marketing and sometimes processing units, none of these practise biosecurity levels that would qualify them for FAO Sector 1 status (Aning, 2006). Large-scale farms have an installed capacity of over 10,000 birds each, operating their own feed mill of at least a one ton mixer and hammer mill and employing at least five permanent workers registered with the Social Security and National Insurance Trust (SSNIT) of Ghana (Regulations of the Large Scale Poultry Farmers Association – Greater Accra). There are only five such farms in Ghana and they are privately owned. These operations are located mainly in the Ashanti, Greater Accra and Brong-Ahafo regions (Table 8). Medium commercial poultry farmers have

installed capacities of 1,000 to 5,000 birds, whereas small-scale farms produce less than 500 birds. Medium and small scale commercial farms rely on the large-scale integrated farms for their day old chicks and feed, but may also obtain feed from other sources. In these farms, birds are always kept indoors, on deep litter or in battery cages. These medium and small-scale operations fall under Sector 3 of the FAO classification (Aning et al, 2008).

Table 8: Distribution of Commercial Poultry Farms and Systems of Operation

Administrative Regions	FAO system (Number of farms in classifications)				Total
	1	2	3	4[a]	
Greater Accra	-	147	342		487
Central	-	8	24		32
Western	-	7	51		58
Eastern	-	6	27		33
Volta	-	-	6		6
Ashanti	-	169	329		498
Brong -Ahafo	1	44	173		281
Northern	-	-	21		21
Upper East	-	-	3		3
Upper West	-	-	15		15
Total	1	380	991		1372

Source: Aning, 2006

[a] – Comprises local chickens kept by the majority of almost all rural and peri-urban households (5-25 birds/household) and in a small number of cases, exotic birds (10-15 household) kept in backyards. Current distribution data by region are not available therefore the above was based on interview only.

Semi-Commercial System

Semi-commercial poultry farms are usually located in the owners' backyard, but the birds raised are exotic breeds, largely cockerels for sale during festive occasions (Henaku, personal communication). However, recently, some Non-Governmental Organizations (NGOs) have initiated schemes to encourage production of eggs in this system (Akunzule, 2006). The number of birds kept typically is below 500. In most cases, they are always housed on deep litter, but in some cases the birds may be allowed into chicken runs. The level of biosecurity in these farms is low.

Backyard/Village Poultry Production System

This system is predominantly comprised of traditional village poultry (chicken, guinea fowl, ducks, turkeys, doves) raised mainly to supplement household incomes and to supplement household meat and egg consumption (Aboe et al., 2006a). The birds are also given as gifts to esteemed visitors and may be used as payment for a dowry and in religious and cultural rites. This system is characterized by low-input of feeding and housing, which makes it profitable. Birds are scavengers, but are given supplementary feed and usually housed at night. Almost all households in the rural areas keep some poultry in this system. The main constraint to production is Newcastle disease (Aboe, Boa-Amponsem, Okantah, Dorward & Bryant, 2006a; Awuni, 2002). This system falls under Sector 4 (FAO classification) with very minimal biosecurity.

The total number of commercial poultry farms in Ghana (large-scale, medium and small-scale) was estimated at 1372 in 2005. Their regional distribution and FAO classifications are shown on Table 8

Poultry Production, Consumption and Trade in Ghana

Poultry production in Ghana is mainly a smallholder activity, even though a few large commercial farms exist. It is an important domestic source of meat, contributing as high as 25% (same as cattle) of the total domestic meat production between 2000 and 2004 (see Figure 3)

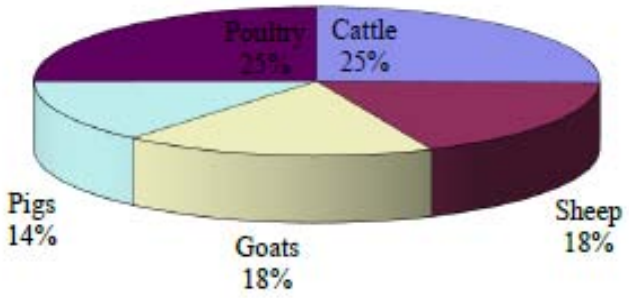

Figure 3: Average Contribution of Poultry to Domestic Meat Production (2000 to 2004)
Source: Aning et al (2008).Computed from SRID, MOFA Sources, Accra

Table 9 reports the sources of poultry meat (domestic production and imports) in Ghana from 1995 to 2004.

Table 9: Potential Sources of Poultry Meat (metric tons) in Ghana (1995-2004)

Year	Domestic (%)	Imports, Frozen (%)	Total
1995	12,112 (88)	1,691 (12)	13,803
1996	14,519 (80)	3,682 (20)	18,201
1997	16,926(74)	5,891 (26)	22,817
1998	19,333 (80)	4,811 (20)	24,144
1999	21,740 (67)	10,776 (33)	32,517
2000	24,147 (72)	9,160 (28)	33,307
2001	26,554 (47)	30,261 (53)	56,815
2002	28,962 (37)	48,947 (63)	77,909
2003	31,369 (53)	27,798 (47)	59,166
2004	33,776 (46)	39,098 (54)	72,864

Source: LPIU, MOFA (2005).

Since 1999, the proportion of poultry meat imported has increased tremendously to meet a demand that has not been met by local production. In 2003, an attempt was made by the government of Ghana to curtail levels of importation to protect and promote local production through the imposition of a 20% supplementary import duty on poultry meat imports. In that year, domestic production supplied 53% of total poultry meat in Ghana. But the policy was rescinded when it came under pressure from the International Monetary Fund

and other external donors. The following year, domestic poultry production dropped to 46% and imports rose to 54% (Table 9).Local poultry meat is derived from both exotic (commercial) birds and local (village) breeds, as reported in Table 10.

Table 10: Estimated Local Poultry Meat Production (in tons) (1995-2005)

Year	Exotic layers	(Commercial) Broilers	Birds Cockerels	Sub-Totals	Local chickens	Grand Total
1995	5,738	2,474	305	8,517	3,595	12,112
1996	5,804	3,201	1,062	10,067	4,452	14,519
1997	5,870	3,928	1,818	11,617	5,309	16,926
1998	5,936	4,655	2,575	13,167	6,167	19,333
1999	6,002	5,383	3,332	14,716	7,024	21,740
2000	6,068	6,110	4,088	16,266	7,881	24,147
2001	6,135	6,837	4,845	17,816	8,738	26,554
2002	6,201	7,564	5,601	19,366	9,595	28,962
2003	6,267	8,291	6,358	20,916	10,453	31,369
2004	6,333	9,018	7,114	22,466	11,310	33,776
2006	6,399	9,746	7,871	24,016	12,167	36,183

Source: Aning *et al*. (2008) .Quoted From LPIU, MOFA.

The above figures reflect the relative contributions of commercial and village poultry to local poultry meat production. Although it is generally assumed that village poultry forms about 80% of the national poultry populations, Table 10 shows that a greater proportion of poultry meat consumed in Ghana is of exotic poultry origin, and that locally produced poultry meat is unable to meet demand.

According to the National Association of Poultry Farmers (GNAPF) , this situation arose due to the 'dumping' of cheaper (subsidized) poultry meat on the Ghanaian market, while at the same time, Ghana government subsidies on some production inputs, such as drugs, were removed and import duties on others were increased with the restructuring of the Ghanaian economy.

Local broiler production has consequently become barely profitable and many farmers have switched to egg production. This has affected hatchery operations, with most hatcheries operating well below capacity. Their operations are currently limited to producing day old broiler chicks to meet the market for Christmas and Easter festivities and the pullet replacement operations of egg producers. Other activities in the poultry sector chain have also been adversely affected.

The recent increases in poultry meat imports, particularly for chicken which has increased more than four times between 2000 and 2005 (see Table 10), underscores the important role poultry imports have assumed in Ghana in recent years. A critical look at the chicken meat types provides evidence of consumption turning towards chicken parts rather than whole chicken.

The changes have been particularly significant in the case of chicken thighs (Figure 4), which seem to be preferred because of the ease of use in preparing many Ghanaian dishes. Prior to 1997, chicken wings and legs were the major chicken parts imported. However, this composition changed in favor of increasing imports of chicken thighs and this has been the trend since 1997. Importation of whole chicken is minimal. On the whole, chicken importation has risen consistently since 1995 with chicken thighs dominating and rising to

almost 30,000 tons in 2001 and in 2004. Poultry imports over the period between 2000 and 2004 have increased by about 1200%.

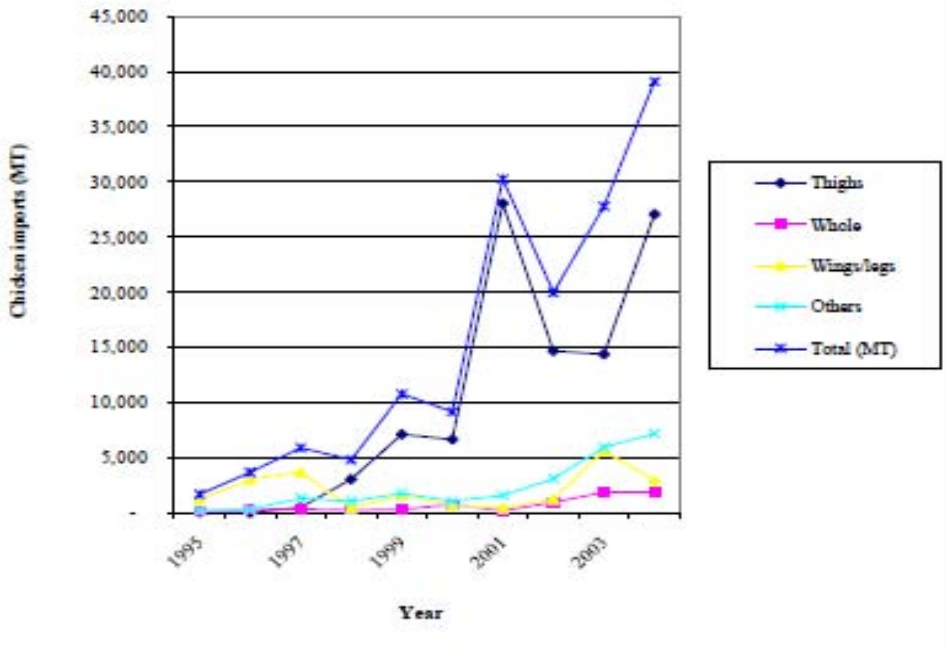

Figure 4: Imports of Chicken Parts, 1995 – 2004
Source: Asuming-Brempong *et al*. (2006)

The major countries exporting poultry meat to Ghana are Brazil, the member countries of the European Union and the United States of America, which together account for more than 75% of total poultry imports (see Figure 5), with the USA being the biggest exporter to Ghana followed by the Netherlands and Brazil.

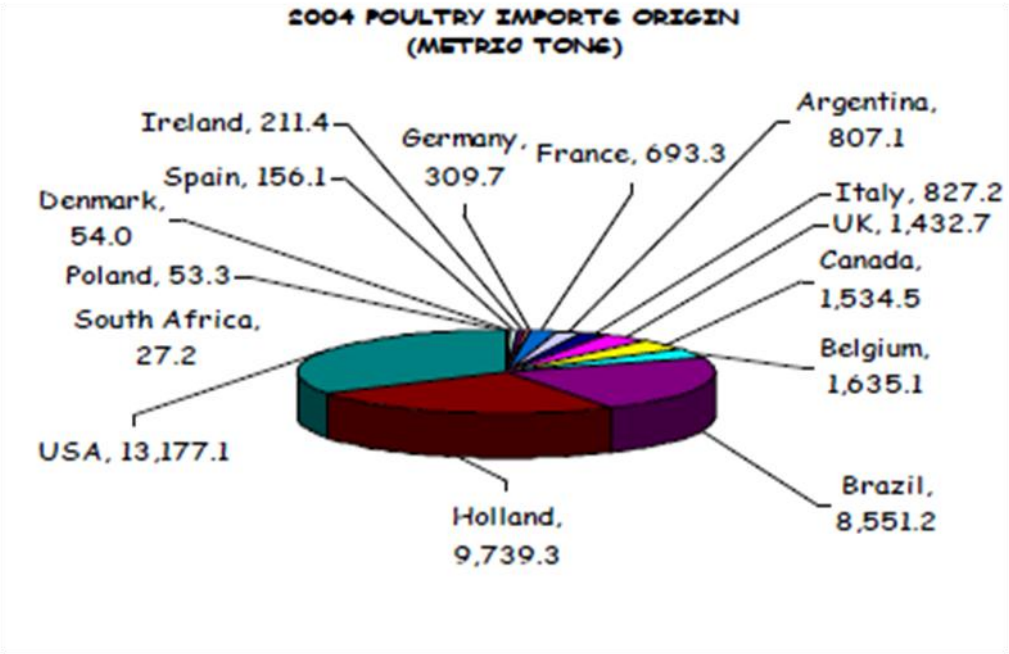

Figure 5: Major Countries that Exported Poultry Meat into Ghana in 2004 (tonnes)
Source: Aning et al (2008). Computed from data obtained from LIPU of MOFA and MOTI

The tariff imposed on imported food items, including poultry products, has not changed since the 1990s. The basic tariff has stood at 20%, but other taxes such as Value Added Tax (VAT), National Health Insurance Levy (NHIL) and Economic Community of West African States (ECOWAS) levy have been added over time (Table 11). Even though some identifiable bodies (such as the Ghana Poultry Farmers Association) have tried to pressure the government into raising the tariff on poultry imports to improve the competitiveness of local production, they have not succeeded, mainly due to the government's commitment to existing multilateral and bilateral arrangements.

Table 11: Tariff and Other Taxes on Imported Poultry Meat

Custom Duty (tariff)	Value Added Tax	National Health Insurance Levy	ECOWAS Levy	EDIF Levy	Destination Inspection Scheme	Total Taxes	WTO Bound Rate
20%	12.5%	2.5%	0.5%	0.5%	1.0%	37.0%	99%

Source: Aning et al (2008) quoted from MOTI and CEPS, Accra

Note*:* charges are the same for all imported commodities studied

Abattoirs and Meat Processing Plants

Table 12 lists poultry abattoirs and processing plant operators. Two of these (Afariwaa and Asamoa-Yamoa) in principle provide necessary facilities for "satellite" broiler producers. The latter are smaller farms located around the processing plants. They may be provided day old chick feed and other inputs for broiler bird production by the larger farms. The live birds are then acquired by these larger farms for processing into whole frozen chicken for sale. Alternatively, the "satellite" farms may produce at their own cost and sell to the processing plant operates at an agreed price. This practice does not seem to be working well. A large fast food company (Papaye) processes its own birds. SOTREC converts chicken meat into other products. A list of abattoirs and processors is given in Table 12. (Aning,Turkson & Asuming-Brempong, 2008).

Table 12: Abattoirs and Poultry Meat Processors

Processing Plant	Location	Integrated
Midland (Darko) Processing Plant	Akropong, AR	Yes
Asamoa-Yamoa[1]	Kegyasi, AR	Yes
Afariwaa Farms[1]	Michel Camp, GAR	Yes
Farmer George	Prampram, GAR	Yes
Papaye	Accra, GAR	No
SOTREC[2]	Accra, GAR	No
Stillwaters[3]	Kumasi, AR	No

[1] Provide processing facilities for "satellite" broiler producers

[2]Adds value, producing nuggets, sausages, frankfurters and marinated chicken

Source: (Aning, 2006).

Factors Affecting Demand for Meat

The factors affecting purchasing pattern of meat and meat products have to be identified in order to comprehend the changes in the purchasing behaviour of consumers to make a qualified prognosis for the further development of consumers demand. Stern, Dietz, Ruttan, Socolow & Sweeney (1997) described that consumption can only be properly understood through the analysis of a multiple factors. A range of economic, cultural, social, religious, marketing and personal factors determine the consumer behaviour (Dietz, Frisch, Kalof, Stern

& Guagnano, 1995). With respect to meat and meat products, factors such as safety guarantee, quality assurance and trustworthy information, as well as interest in animal welfare and convenience are the most relevant consumer considerations (Devine, 2003; Verbeke, 2005; Verbeke & Vackier, 2004).

Women have more moral and ecological concerns than men and thus differ from male in their eating habits. The elders are more concerned about health and ethical standards (Harvey, Erdos & Chalinor, 2001; Beardsworth, Bryman, Keil, Goode, Haslam & Lancashire, 2002). Religion influences consumer attitude and behaviour in general (Delener, 1994; Pettinger, Holdsworth, & Gerber, 2004; Musaiger, 1993) and food purchasing decisions and eating habits in particular (Mennell & Van Ootterloo, 1992; Steenkamp, 1993).

According to Schroeder & Mark (2000), numerous factors that jointly influence poultry meat demand over time can be broadly categorized as:

1) Consumer incomes,

2) Health/nutrition concerns,

3) Consumer preferences for meat product attributes

Explanations for the three factors enumerated above are:

Consumer Income: One of the non-price factors that affect poultry meat demand is consumer income or expenditure (Capps, Moen & Branson, 1988; Brester & Wohlgenant, 1991; Schroeder & Mark, 2000). Poultry meat is generally considered a normal good, that is, as consumer income increases, poultry meat demand increases. Consumer income has trended upward over time, increasing at an annual average inflation-adjusted rate of 1.7% per year since 1980 (LMIC,

1999). Economic theory suggests that at low levels of income, most goods are normal, but as income increases, the likelihood that a good becomes inferior increases (Tomek & Robinson, 1990). Schroeder, Barkley & Schroeder (1995) estimated meat demand across a wide range of income levels and found that all meat products are normal goods at low-income levels. Poultry is an inferior good (an increase in income generates a decrease in demand) at moderate to high income levels.

Health Concerns**:** Another important non-price issue of concern to poultry meat consumers is perceived health and nutrition effects of consuming red or white meat. Kinnucan, Xiao, Hsia & Jackson (1997) found that beef demand was adversely affected by health information, indicating that consumers have reduced beef consumption as additional information on cholesterol has been discovered and become publicly available. They suggested that poultry benefited from dissemination of cholesterol health information at the expense of beef, whereas pork and fish/seafood demand was unaffected by cholesterol information. Kinnucan et al. (1997) reported that health information elasticities were generally greater (in absolute value) than price elasticities, indicating that a relatively small percentage of change in health information leads to larger changes in meat consumption than an equivalently small percentage of change in relative prices.

Consumer Preferences for Meat Product Attributes

Consumer preferences have changed dramatically over time. Preference changes have occurred due to numerous demographic factors (Henneberry & Charlet, 1992). Aging population is one factor causing changes in meat consumption. The median age in the United States has been rising for nearly 50 years, and predictions indicate by the year 2010, persons 65 and over will comprise 16% of the U.S. population. Older people tend to consume more poultry and less beef (Blaylock & Smallwood, 1986). These trends offer the beef industry the opportunity to target leaner cuts of beef to older people because they typically indicate a desire for leaner beef (Capps et al., 1988).

According to a research conducted in Sri Lanka by De Silva, Atapattu & Sandika (2010), only 1 % of the respondents did not eat any type of meat. Many of the respondents (85%) had established their meat consumption pattern at their child age. The religious believes (74 %), economic concerns (47 %) and antipathy for killing animals (82 %) were the most cited reasons for not being meat consumers. Forty eight percent of consumers mentioned age as a factor for not being meat eaters. Several authors (Delener, 1994; Pettinger et al., 2004; Musaiger, 1993) have reported a strong influence of religious believes on meat consumption pattern. However, it is interesting to note that those who rejected meat on religious reasons and due to antipathy for killing animals consumed fish and/or egg.

When assessing consumption of the individual kind of meat, the most preferred meat types were chicken (84 %) followed by mutton (44 %), beef (33 %) and pork (24 %) and preference order for different types of meat was

significantly different from each other. Compared to pork and beef, the consumption of chicken is not regulated by ethno-religious beliefs and moreover, chicken is considered as healthy white meat. The above factors may be the reasons for the popularity of chicken over other types of meat. Chicken was more popular among females than males. Females have been found to be more health concerned than male (Almas, 1999) and thus it may be the reason for the popularity of chicken among them. Interestingly no Buddhists female respondent consumed beef.

In the same De Silva et al (2010), correlations between the consumption of raw and processed beef, chicken, mutton, pork and other with sample variables showed that there were no significant correlations ($P>0.05$) between the type of meat consumed and the factors such as the type of market (urban or rural), education level and occupation. But there were significant correlations ($P<0.05$) between the type of meat consumed and the factors such as sex, religion and family size.

The location of residence had no influence on the meat consumption habits of individuals. But gender was found to have significant affect on meat consumption. Males (97 %) tended to eat all meat types than females (79 %). Dietz, et al., (1995) also found that vegetarianism was more popular among females than males.

Again, from De Silva et al (2010), 34.7% of respondents considered 'availability', 76.2% considered religious sentiments, 39.2% health concerns, 78.5% financial capabilities and 38.5% traditional beliefs as factors in purchasing meat and meat products.

The results of De Silva et al (2010) showed that religion had a significant effect on the consumption of all types of meat.

The results showed an inverse relationship between age and different type of meat consumption. Senhui et al., (2003) also showed that when people become older they pay a special attention to health attributes of their diet and thus cut down their meat consumption. Education had no significant effect on meat consumption. The education level of the respondents was reasonably high; 78 % of the respondents had at least secondary education. Therefore, many of the respondents may be aware about the nutritional importance of animal protein sources. However, results showed that respondents with higher educational levels had less preference for beef. This is an expected result because more educated people may be better informed about beef to be a source of dietary cholesterol (Anderson & Shugan, 1991).Household size had a significant positive effect on overall meat consumption and on chicken consumption. Furthermore, households having kids were more likely to consume meat than households without having kids. This may be due to the difference in the nutritional and dietary needs arisen due to the age structure of the family. Professions of the respondents also did not have effect on meat consumption.

Hoffman, Nkhabutlane, De Schutte & Vosloo (2004) said that recent studies indicate that consumer food choices are influenced by health, taste, convenience, visual appeal and reasonable prices (Mermelstein, 2002). The main interest of consumers is to eat foods that provide more than the known traditional nutritional benefits in the sense that they tend to view food as medicine, because they are aware that prevention is better than treatment or cure

(Mermelstein, 2002; Sloan, 1999). They are therefore obsessed with so-called healthy foods, which are perceived to make them feel and look better.

A few European studies have included both media coverage and advertising expenditures in meat-demand systems in order to measure to what degree advertising has helped reduce the influence of negative information on consumer food choices. Recent events in the North American market suggest the need for a similar evaluation. It is possible that advertising could ameliorate the effects of negative information. The own-generic advertising elasticity is positive and significant for pork. Thus increased advertising expenditures from hog producers significantly increases consumption of their product. On the other hand, pork consumption is negatively affected by increased generic advertising expenditures made by chicken producers. Both beef and chicken brand advertising have significant and positive own effects. Beef and pork brand advertising have significant but positive effects on chicken consumption. Beef fast food restaurant advertising significantly increases beef consumption and significantly impacts chicken consumption (positively) (Lomeli, Goddard & Lerohl , 2004).

Cultural factors are among the factors affecting consumer behaviour – society culture; social – a reference group, family, position in society; personal – age, occupation, economic situation, life style, and life-cycle including psychological factors such as motivation, perception, learning or attitudes.

According to Ingr (2004), the consumption of different kinds of meat depends on the following three factors: wholesomeness of meat, quality of meat

and, last but not least, the consumer price. Thus, it is evident that the consumer price will play one of the crucial parts in meat consumption.

Also, the research results of Pourová, Pour, & Čermáková, 2004, which focused on the perception of and the preferences in eight kinds of meat by Czech consumers (beef, pork, poultry, lamb, mutton, veal, fish and turkey), showed that consumers buying meat are most influenced by the seven following factors: fine taste, wholesomeness, fat content, price, availability on the market and easy preparation. These factors had a substantial impact on meat consumption and on the choice of consumers.

In Kubíčková & Šerhantová (2005), healthy lifestyle was a priority in determining the purchase decisions of consumers of fish where 49% of consumers considered this factor decisive, 38% of poultry consumers and 21% of consumers of kinds of meat such as game or rabbit. The healthy life style played role more frequently in all the studied categories; women found the healthy lifestyle a more important factor than men.

Ghafoor, Badar, Hussain & Tariq, 2010, stated that age and education of consumers were non-significant variables affecting poultry meat demand. A qualitative variable was used to capture effect of bird flu on demand of poultry meat, which was found significant.

Demand for food of animal origin in developing countries is expected to double by the year 2020 (Delgado, Rosegrant, Steinfeld, Ehui & Courbois, 1999). Enhanced by increases in urbanization, population and income growth, such demand will create markets for animal products and encourage commercialization of livestock production (Delgado et al., 1999). The extent of

this commercialization depends on the consumption of the products by consumers. Consumer tastes and preferences are reflected in the market. These are revealed through purchase decisions and price premiums that consumers pay for both visible (Langyintuo, Ntoukam, Murdock, Lowenberg-DeBoer & Miller, 2004) and invisible characteristics of meat.

The results of the maximum likelihood coefficients from estimation indicate that the current price of meat, household monthly income spent on food and the proportion spent on meat per month relative to household monthly income spent on food have a statistically significant influence on the probability of willingness to pay for a particular meat. Also, household size adult equivalent and perceived ranking of meat as of good quality relative to other meat have a statistically significant influence on the probability of willingness to pay for a particular meat (Juma, Baltenweck, Drucker & Ngigi, 2007).

The coefficient of the current price of meat is negative and significant ($p < 0.1$) in explaining the probability of willingness to pay for the small meat. This implies that the higher the current prices at which households are buying poultry meat, the lower the likelihood of households to be willing to pay for poultry meat. The coefficient on monthly income spent on food by households is positive and significant ($p < 0.05$) in explaining the probability of willingness to pay for the poultry meat. This indicates that the higher the household income, the higher is the probability that the household would be willing to pay for the poultry meat. The coefficient of the proportion spent on poultry meat per month, relative to household monthly income is negative and significant ($p < 0.05$) in explaining the probability of willingness to pay for the poultry meat. The results

indicate that the larger the household budget share paid for meat, relative to household income, the less the probability that the household will be willing to pay for the small poultry meat. This could be explained by the fact that household income is distributed among many food needs, so if the cost of meat increases then other food needs will not be achieved (Juma et al, 2007).

Factors Affecting Supply of Locally Processed Poultry Meat

In a study conducted by Adebayo & Adeola, (2005), it came out that, educational level of poultry farmers had positive and significant relationship with average production while age has negative and non-significant relationship with the average production of the respondents. However, the significant relationship between educational level and average production could be due to sound knowledge and efficient management required of poultry farmers to ensure profitability in poultry business. Among the constraints identified in that study, finance and input had significant relationship with average production of the respondents. Probable reason for this may be due to the fact that, only few respondents had access to credit facilities or loan from financial institutions. Earlier reports (Agbato, 1997; Akeeb, 1997) also confirmed that credit facilities or loans from financial institutions are not accessible to the poultry farmers. The rest of the factors, namely, access to extension and veterinary services, labour and market had negative and non-significant relationship while infrastructure facilities and government policy had positive and non-significant relationship with average production.

According to Ghafoor et al, 2010, sale price was found to be the most important variable affecting supply of poultry birds. The coefficient of sale price was positive and significant ($P<0.01$). The value of this coefficient revealed that in response to one unit increase in sale price, the supply of poultry live birds increased by 0.614 units.

Average cost of inputs was another important variable affecting supply of poultry birds. The coefficient of this variable was -5.89 ($P < 0.05$) which showed that for every one unit increase in average cost, there might be 5.89 mounds decrease in supply of live poultry birds. Experience of a person shows the level of technical know-how in the business activity. The coefficient of experience was 0.547 ($P<0.05$), indicating that for every one unit increase in experience, there might be an increase of 0.54 mounds in the supply of live poultry birds. Similar results were obtained by Javed, Farooq, Mian, Durrani & Mussawar, (2003), Islam (2003) and Adesiyan, Adeleke, Adelalu & Salako, (2007). Distance from the central market affects farmer's decision to take the produce to the market or sell at the farm. Farmer often decides to sell at farm as the distance from the market increases. The coefficient of distance from market showed a negative sign with the poultry live birds but was non-significant. Education is considered an important variable in the business enterprises as it increases the ability of a person to handle business more efficiently. The coefficient of this variable showed positive sign with the supply of live poultry birds but it was also non-significant. In addition, the effect of bird flu on the supply of live poultry birds was found significant ($P < 0.05$). The value of this

variable indicated that there might be 161 mounds decrease in supply of live poultry birds if farmer thought that their business would be affected by bird flu.

According to Akanni (2007), the poultry industry in developing countries of Africa is continually characterized by low production levels (Okoli, 1991).This is largely associated with lack or limited finance (credit facilities) for the procurement of basic poultry equipment and materials. Feed ingredients are also expensive. This makes it difficult for the farmers to produce and supply sufficient and good quality feeds to the poultry birds (Oyenuga, Jakondas, Babatunde ,Oluyemi, Ogunfowora.& Fetuga, 1977; Ogunfowora, Fetuga, Ademosun, Offion, Akinola & Koopman, 1975).

Again, in Akanni (2007), the variables that had significant co-efficient are educational status, years of poultry keeping, household size, interest rate on loans and number of poultry birds. Only level of education, poultry keeping experience, number of poultry birds and input usage were significant variables at 1% while household size and interest rate were significant at 5 % level.

Ja'afar-Furo & Gabdo (2010) said that lack of support from the government in terms of provision of soft loan, extension services to boost poultry production was the third most (97.5%) pressing constraint experienced in the study area. This finding reconfirmed the negligence of government towards the promotion of improved poultry practices among the poultry farmers in the surveyed area. High cost of feeds is one of the factors of poultry production among these constraints.

Distributors and Distribution

Wholesalers and other kinds of distributors can be very effective and useful channels for selling to ones ultimate customers and consumers. Lawless (1991), states that an established distributor can give an immediate access to one's target market without the need to build your own sales presence. A sales agent or distributor can also be particularly useful if a production firm is trying to break into a new market, for example overseas where firms do not have experience and expertise. Such activities of marketing agents or distributors reduce advertising cost of poultry producers.

CHAPTER THREE

METHODOLOGY

Overview

The issues discussed under this chapter explain the methodology used to conduct the research. They cover the research design, study population and source and type of data. It also includes instrumentation, sampling procedure and sample size, pre-testing of instrument, selection and training of field assistants. Again, field data collection procedure, data analysis and model specification are captured under this chapter.

Description of the Study Area

The Greater Accra region is the study area. Greater Accra region was purposively selected based on the fact that according to Aning (2006), Greater had the highest number of poultry population in 2005 amongst the ten regions of Ghana as depicted by Table 2. Greater Accra region is the smallest region in terms of landmass covering a total surface area of 4,450km.sq. It is centrally located within the coastal belt of Ghana and shares boundaries with the Eastern Region to the north, Central region to the west and Volta Region to the east. To the south of the region lies the Gulf of Guinea which spans 220km coastline stretching from Langma near Kasoa in the west to Ada in the east.

Administratively, the region is divided into ten (10) Assemblies namely Accra Metropolitan Assembly, Tema Metropolitan Assembly, Ga West

Municipal Assembly, Ga East Municipal Assembly, Ga South Municipal Assembly, Adentan Municipal Assembly, Ashaiman Municipal Assembly, Ledzokuku-Krowor Municipal Assembly, Dangme East district Assembly and Dangme West district Assembly (www.ghanadistrict.com). According to GSS (2012), the total population of the Greater Accra Region is 4,010,054 which consist of 1,938,225 males, 2,071,829 females and in all Greater Accra Region accounts for 16.3% of the total national population. The Greater Accra Region has the highest population of urban dwellers of 90.5%. The concentration of industries and commercial activities in the Greater Accra Region may partly account for the relatively higher urban population in the region. In Greater Accra region, most of the economically active population is more likely to be engaged as service and sales workers (35.3%) and less likely to be engaged as skilled agricultural, forestry and fishing workers (5.8%).

In the Greater Accra, the agricultural sector employs 41.6% of the economically active population aged 15 years and older. (GSS, 2012). The main agricultural activities are livestock and poultry production, fishing, and production of maize, cassava, vegetables notably pepper, okro, garden eggs, cabbage, tomatoes, Asian vegetables, fruits such as pineapple, water melon pawpaw and tree crops such as mango. Haussmann (2007) conducted fact findings into poultry producing districts in the Greater Accra Region, namely Koluedor and Ashaiman which revealed that if Ghana fixed its tariffs to agree with the ECOWAS Common External Tariff, Ghana would be infringing on provisions of the International Covenant on Economic, Social and Cultural Rights it ratified in 2000. Hausmann noted that the survey also showed that

poultry production in the Greater Accra region was at a high risk of collapsing, as most farmers had moved from the production of broilers to eggs due to the influx of imported chicken in markets. She also identified increase in price inputs as a major challenge to the farmers. All the farmers complained that production costs had increased more than producer prices. For poor peasants, the increasing gap means that they will have to reduce their meals, since they had started running into debts. The pre-condition for the development of a vibrant poultry sector would be a higher level of market protection and a simultaneous development of processing infrastructure in the country. Hausmann said the survey also showed that Government's support for farmers in the sectors had not been encouraging and appealed to both Government and the international community to support the farmers to raise household incomes and improve food security. (Hausmann, 2007).

Greater Accra region dominates in terms of poultry birds' population in the country. Exotic birds are kept for commercial purposes, and they are more abundant in the urban areas of Greater Accra where markets for their products exist (LPIU, 2006). According to the literature, though poultry birds were found throughout the Greater Accra region, they were concentrated in urban areas where incidentally the three main poultry farmers associations were located. The three main poultry farmers associations are Greater Accra Poultry Farmers Association (GAPFA), Tema Metropolitan Livestock and Poultry Farmers Association (TMLPFA) and Oyarifa Livestock and Poultry Farmers Association (OLPFA). Hence, the decision to select Accra Metropolis, Tema Metropolis and Ga District as the study area within the Greater Accra region. Members of the

Greater Accra Poultry Farmers Association (GAPFA) were mainly located within the Accra Metropolitan Assembly, Ga South Municipal Assembly and Ga West Municipal Assembly. Members of the Tema Metropolitan Livestock and Poultry Farmers Association (TMLPFA) were largely from the Tema Metropolitan Assembly, Ashaiman Municipal Assembly and the Ledzokuku-Krowor Municipal Assembly. Also, the Oyarifa Livestock and Poultry Farmers Association (OLPFA) members were mainly from the Adentan Municipal Assembly and the Ga East Municipal Assembly.

Research Design

The research employed descriptive survey design. The survey permitted the researcher to summarize the characteristics of different groups of poultry farmers, poultry meat sellers and poultry meat consumers to ascertain the underlying causes for the inability to produce locally processed poultry meat to meet the demand of the Ghanaian consumer, problems associated with the poultry meat business and reasons for the Ghanaian consumer's preference for imported processed poultry meat and locally processed poultry meat.

Study Population

The population for this study was all poultry farmers who belonged to known or recognized poultry farmers' associations, consumers of poultry meat and sellers of poultry meat in the Greater Accra region. Poultry farmers, sellers and consumers are spread out in the whole Greater Accra region and therefore a sample of the population of poultry farmers, sellers and consumers were taken

from the Greater Accra region. The Greater Accra Poultry farmers Association (GAPFA) is made up of about 200 members, Tema Metropolitan Poultry Farmers Association (TEMPFA) making up of about 50 active members and Oyarifa Livestock Farmers Association (OLFA) comprising of about 45 active members. Also, according to ISODEC (2004), the number of registered poultry farmers in the Greater Accra region was 344.

Sampling Procedure and Sample Size

This study employed combination of purposive and random sampling techniques. The study area, Greater Accra, was selected purposively.

With the help of information gathered from the respective poultry farmers associations, the researcher used a multi-stage sampling technique and settled on a conservative proportion of 1:2:3 which translate into one (1) poultry farmer producing for two (2) poultry meat sellers and in turn selling to three (3) poultry meat consumers. The random sample size was 216, which constituted 12 commercial poultry farmers from each of the three main poultry farmers' associations within three districts the region, 36 poultry meat consumers from each of the three selected districts and 24 poultry meat sellers from each of the three districts within the region.

Twelve (12) poultry farmers were randomly selected from each of the membership of the three poultry farmers associations within the study area. This sums up to 36 poultry farmers sampled for this study. In sampling the poultry meat consumers and sellers, the snow-ball sampling method was used using the poultry farmers selected randomly as point of reference where each poultry

farmer selected indentified two poultry meat sellers he or she had interacted with and each seller linking the researcher up with three poultry meat consumers buying from him or her. In all, 72 sellers of poultry meat and 108 consumers of poultry meat were selected making the total sample size 216 drawn from the population.

13: Summary of Population, Population Size, Sample Size and Sampling Technique Used

Population	Population Size	Sample Size	Sampling Technique
1.Poultry farmers	All poultry farmers who belong to a registered poultry farmers' association in the Greater Accra region , 344(ISODEC,2004)	36	Simple Random
2.Consumers of locally processed poultry meat	All consumers of locally processed poultry meat in the Greater Accra region	108	Snow-ball
3. Sellers of locally processed poultry meat	All Sellers of locally processed poultry meat in the Greater Accra region	72	Snow-ball
Total	-	216	

Source: Field data, 2009

Data Collection Procedure

Primary data was largely used in the study. Cross-sectional information was obtained through a field survey of poultry farmers, poultry meat consumers and poultry meat sellers in the study population who were selected to form the study sample. Secondary data was also obtained from poultry farmers associations. In general, data was obtained on the socio-economic characteristics, socio-demographic characteristics of poultry farmers, type of poultry enterprise, level of poultry meat production, severity of factors

responsible for low or non-processing of poultry meat, demand and sale of their products and sources of funding. With the consumers, data was obtained on the socio-economic characteristics, socio-demographic characteristics, income, demand for poultry meat on the socio-economic characteristics, socio-demographic characteristics of poultry farmers, factors affecting their demand for poultry meat, severity of those factors and opportunities for locally processed poultry meat and reasons for preference for imported processed poultry meat. For sellers of poultry meat, data was obtained on the socio-economic characteristics, socio-demographic characteristics, sales, demand for poultry meat, availability of locally processed meat on the market visa vis the imported processed poultry meat, factors militating against availability of locally processed poultry meat on the market and consumers preference.

Validated structured interview schedule was used to gather data from the respondents. The structured interview schedule was administered by trained enumerators under close supervision of the researcher. In order to maximize response, the items in the interview schedule were explained in the local language of the respondents and their responses were transcribed into the English Language for easy use by the researcher during analysis and interpretation. The period for the data collection was between 5th October and 11th December, 2009.

Instrumentation

The main instrument that was used to collect the data from the respondents was structured interview schedule (see Appendices A, B and C). The instrument was considered most suitable for the research survey based on the following reasons: (i) it provided uniform information which assured the comparability of data (ii) it could easily be used to collect information from any respondent whether literate or illiterate (Kumar, 1999). Moreover, observations were made to obtain information on issues such as the current state of the poultry industry, concentration of poultry farmers and sellers within a particular area within the study area.

Basically, instrumentation for the study was based on the research objectives and the research questions. Specifically, the instruments were developed by looking into variables to be studied, dividing them into a number of indicators and then translating into a number of questions. Finally, the questions were set in a structured interview schedule for the respondents. This process (i.e. translating research topic into variables, variables into indicators and indicators into questions) ensured that each questions had a certain purpose and elicited information related to a specific aspect of research objective/question/hypothesis. In this regard, for example, the respondents' survey structured interview schedule was developed to elicit information on respondents' demographic characteristics (age, education), marital status, and profession, among others.

Instrument Design

In designing the instrument used for the study necessary precautions were taken by the researcher including the instrument administered by researcher and enumerators. For example, the structured interview checklists were designed in such a way that it allowed the researcher to develop rapport with respondents, who in turn provided in-depth information pertaining to research theme.

With regard to the format of items used in the structured interview schedule administered by enumerators, Sarantakos (1998) noted that there are several formats of structured interview schedule. A common requirement for all formats is that the questions have to be listed in a logical order, allowing for transition and flow. Moreover, a particular type of structured interview schedule format is chosen to suit the nature of the survey, the type of respondents, length of structured interview schedule, and nature of administering the structured interview schedule. For this research, following Sarantakos (1998), mixed format was used. This was in consideration of the logic of the research.

The structured interview schedule contained both pre-coded, close ended with fixed alternatives and open-ended questions. For fixed-alternative questions, necessary methodological requirements were considered. According to Sarantakos (1998), the most important standard and principles required in fixed-alternative questions are to be considered in designing such questions. These were the responses categories accuracy, exhaustiveness, mutual exclusivity, and uniformity. In this regard, for instance, severity of constraints

and factors (i.e. ranked scale) with categories responses ranging between most severe to non-severe were divided into appropriate level of severity corresponding to a numerical scale.

Instrument Validation

The research ensured different aspects of instrument validation at different stages of the research by employing appropriate methods. At the initial stage of the research, face validity was determined by the researcher based on the theoretical and empirical literature as well as the objectives and research questions of the study. Supervisors of the researcher at University of Cape Coast and experts in the study area also determined the content validity of the instrument. With regard to content validity, it is noted that content validity of the instrument is determined by looking into the content of instruments in terms of appropriateness, comprehensiveness, adequacy of the question to represent the content, whether logically get to the intended variable, and consistency of the content with the definition of the variable (Fraenkel & Wallen, 2000). Following these authors, construct related validity of the instruments was determined by looking at the items the instrument measures (i.e. indicators of the variables) in line with theoretical and empirical tests showing how these measures show the difference between objects of measure.

Pre- Testing

Pre-testing of the instrument was done as part of the field assistants' training. Smaller number (10) of each of the target groups (poultry farmers,

poultry meat sellers and poultry meat consumers) who were not part of the actual study sample was interviewed. There was close monitoring and coaching of the assistants by the researcher during the pre-test to ensure that the questions were clearly understood by the data collectors and respondents. The survey was introduced properly and responses were properly recorded.

The pre-test was expected to reveal problems with the items in the interview schedule that required changes. Thus after the pre-test, the interview schedule questions were fine-tuned where necessary, and finally photocopied for the main survey. The pre-test was carried out in the Kumasi Metropolis and the Atwima Nwabiagya district in the Ashanti region of Ghana in September, 2009.

Reliability (consistency of score obtained for ranked scale instruments) was determined by using Cronbach's alpha coefficient using responses obtained during field pre-testing of the instrument. Pallant (2001) indicated that Cronbach's coefficient alpha is the most commonly used statistics to test the degree to which the items that make up the scale are all measuring the same underlying attributes. Accordingly, for the research variables assessed using ranked scale items, the alpha coefficients were found to be more than the minimum recommended by Pallant (i.e. 0.7).

Data Management and Analysis

With the help of Statistical Product and Service Solution (SPSS) computer software, the field data was subjected to statistical analysis by the researcher and two research assistants in the case of computer data entries.

Descriptive statistics such as graphs, pie chart, bar chart, tables, frequencies and percentages were used to examine the distribution of data on demographic and socio-economic features of respondents. Supply for poultry meat was estimated from the point of poultry farmers and demand for poultry meat was also estimated from the point of sellers. Poultry farmers, poultry meat sellers and consumers were asked about factors affecting the supply and demand for locally processed poultry meat. A regression analysis was done to access the effect of these factors on the demand and supply of the locally processed poultry meat estimated. Also, poultry farmers, poultry meat consumers and sellers were asked to rank the severity of the factors affecting the demand and supply of locally processed poultry meat. Kendall's Coefficient of Concordance (W) was then employed to measure the extent of association or agreement of the ranks.

Theoretical Framework of Kendall's Coefficient of Concordance

As cited by Legendre (2010), it was proposed by Kendall & Smith (1939) that Kendall's coefficient of concordance (***W***) is a measure of the agreement among several 'judges' (p) who are assessing a given set of *n* objects. Depending on the application field, the "judges" can be variables, characters and so on. It can be computed in several ways but for the purpose of this study the following approach was used:

$W = \frac{S}{\frac{1}{12}k^2(n^3-n)}$ Is the Kendall's Coefficient of Concordance

Where $\boldsymbol{W}$ = Kendall's Coefficient of Concordance and ranges between 0 and 1. $S = \sum(SR)^2 - n\left(S\tilde{R}\right)^2$

Where k = number of judges (poultry farmers, poultry meat consumers or poultry meat sellers); n = numbers of problems ranked; S = sum of ranks; *SR* = sum of squares; $S\tilde{R}$ = mean of sum of ranks.

According to Legendre (2005), W of $0 \leq W \leq 1$ indicates increasing strength of agreement; the closer to 1, the higher the level of agreement or concordance and W of zero signifies disagreement.

Testing for Significance of Kendall's Coefficient of Concordance (*W*)

According to Kothari (2004), the method for judging whether the calculated value of ***W*** is significantly different from zero depends on the size of n as stated below:

(i) If n is 7 or smaller, Appendix H gives critical values of **s** associated with ***W**'s* significance at 5% and 1% levels. If an observed **s** is equal to or greater than that shown in the table for a particular level of significance, then H_o may be rejected at that level of significance.

(ii) Kothari (2004), again, states that if n is larger than 7, we may use Friedman's chi-square (χ^2) = k (n-1) w, with d. f. = (n-1) for judging ***w's*** significance at a given level in the usual way of using χ^2 values.

W is significant if $\chi^2_{cal} > \chi^2_{crit}$ at the prescribed level of significance.

Chi-Square distribution table was used to find the tabulated or critical values of Friedman's chi-square (χ^2).

Model Specification

Theoretical Demand Model

In economics, as in other sciences, explanations and other predictions are based on theories. Economic theories are developed to explain observed phenomena in terms of a set of basic rules and assumptions. Economic theories also form the basis for making predictions. With the application of statistical and econometric techniques, theories can be used to construct models from which quantitative predictions can be made. A model is mathematical representation, based on economic theories of a firm, a market or some other entity. Statistics and econometrics also let us measure the accuracy of our predictions (Pindyck & Rubinfeld, 1995).

According to Jhingan (2003), theoretically, the demand for a commodity is its quantity which consumers are able and willing to buy at various prices during a given period of time. So, for a commodity to have a demand, the consumer must possess willingness to buy it , the ability or means to buy it, and it must be related to per unit of time (per day, per week, per month or per year). Demand (D) is a function of price (X_1), income(X_2), prices of related goods (X_3) and tastes (X_4) and the functional expression of this is given as:

$$D = f(X_1, X_2, X_3, X_4) \quad \ldots\ldots\ldots\ldots \quad 1$$

The general specification of the model can be formulated as

$$D = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots\ldots\ldots\ldots \quad 2$$

Where:

D = demand of the good

β_0= constant

$\beta_{1<0}$, $\beta_{2>0}$, $\beta_{3>0}$ and $\beta_{4<1}$

X_1 = price of the commodity in question

X_2 = income of the consumer

X_3 = price of other related commodity

X_4 = tastes of the consumer.

Empirical Demand Model

In estimating the demand function for locally processed poultry meat per unit of time, there was the need to consider other physical, economic and socio-economic factors, apart from those in the theoretical model, as variables that have specific influence on the demand for locally processed poultry meat. Such variables include health considerations, advertisement, religious considerations, easiness of cooking, availability, prices of imported poultry meat and cultural considerations. Therefore, the empirical model for estimating the demand for locally processed poultry meat will take the form of the theoretical function in equation (2) in addition to the other factors that were not considered in the theoretical function but are important in estimating the demand for locally processed poultry meat. It takes the form:

$$D_{LP} = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

$$+\beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + U_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Where: D_{LP} = Demand for locally processed poultry meat

β_o= Constant

β_1 to β_{12} are coefficients with

$\beta_{1<0}$, $\beta_{2>0}$, $\beta_{3<0}$, $\beta_{4<0}$, $\beta_{5<0}$, $\beta_{6>0}$, $\beta_{7>0}$, $\beta_{8<0}$, $\beta_{9<0}$, $\beta_{10<0}$, $\beta_{11>0}$ and $\beta_{12>0}$

X_1= Price of locally processed poultry meat (monthly price per 1 kg in GH¢)

X_2= Income of consumers (monthly income in GH¢)

X_3= Price of imported poultry meat (price per 1 kg in GH¢)

X_4= Proportion of consumer's income spent on poultry meat per month (in GH¢)

X_5 = Health benefits with respect to other meat (dummy: Yes = 1, No = 0)

X_6 = Advertisement (dummy: Yes = 1, No = 0)

X_7 = Easiness of cooking (dummy: Yes = 1, No = 0)

X_8 = Availability (dummy: Yes = 1, No = 0)

X_9 = Religious consideration (dummy: Yes = 1, No = 0)

X_{10} = Cultural consideration (dummy: Yes = 1, No = 0)

X_{11} = Price of other meat on the market (price of beef, chevon or pork per 1 kg in GH¢)

X_{12} = Taste of the poultry meat (dummy: Favourable = 1, Unfavourable = 0)

U_t = Error term

Theoretical Supply Model

The concept of supply describes as the quantity of a good or service a household or firm would like to sell at a particular price. As with demand, the quantity supplied can change according to a variety of factors. These factors include a change in the price of inputs (Y_1), a change in technology (Y_2), a change in the natural environment (Y_3), a change in expectations (Y_4) and a change in the availability of credit (Y_5) , (Stiglitz, 1993). The functional expression is given as:

$$S = f(Y_1, Y_2, Y_3, Y_4, Y_5) \ldots\ldots\ldots\ldots 4$$

The general specification of the model is:

$$S = \beta_0 + \beta_1 Y_1 + \beta_2 Y_2 + \beta_3 Y_3 + \beta_4 Y_4 + \beta_5 Y_5 \ldots\ldots\ldots\ldots 5$$

Where:

S = Supply of a good

β_0= Constant

$\beta_{1>0}$, $\beta_{2>0}$, $\beta_{3<0}$, $\beta_{4>0}$ and $\beta_{5>0}$

Y_1 = Price of inputs

Y_2 = Level of technology

Y_3 = Natural environment

Y_4 = Expectations

Y_5 = Availability of credit

Empirical Supply Model

In specifying the model for estimating the supply of locally processed poultry meat in the Greater Accra Region, there are other real factors that specifically influence the supply of locally processed poultry meat in the Greater Accra that should be factored in the model specification. Hence, the empirical model for estimating the supply of locally processed poultry meat in the Greater Accra Region will include the theoretical supply function in equation (4) in addition to those specific factors not considered in the theoretical model but are of importance in estimating the supply of locally processed poultry meat in the Greater Accra Region. Those specific factors are price of imported poultry meat (Y_2), Government policy in terms of tariffs on imported poultry meat, borrowing

rate of interest to agriculture (Y_5), processing know-how (Y_6), distance from the consuming market (Y_9), technical support (Y_{10}) and disease outbreaks (Y_8). It takes the form:

$$S_{LP} = \beta_o + \beta_1 Y_1 + \beta_2 Y_2 + \beta_3 Y_3 + \beta_4 Y_4 + \beta_5 Y_5 + \beta_6 Y_6 + \beta_7 Y_7 + \beta_8 Y_8 + \beta_9 Y_9 + \beta_{10} Y_{10} + U_t \quad \ldots\ldots 6$$

Where: S_{LP}= Supply of locally processed poultry meat

β_o= Constant

β_1 to β_{10} are coefficients with

$\beta_{1>0}$, $\beta_{2>0}$, $\beta_{3<0}$,$\beta_{4>0}$, $\beta_{5<0}$,$\beta_{6>0}$,$\beta_{7>0}$,$\beta_{8<0}$,$\beta_{9<0}$ and $\beta_{10>0}$

Y_1 = Price of locally processed poultry meat (price per 1 kg in GH¢)

Y_2 = Price of imported poultry meat (price per 1 kg in GH¢)

Y_3 = Average cost of inputs for local production (monthly average cost in GH¢)

Y_4 = Government policy in terms of tariffs on imported poultry meat (dummy, favourable = 1, unfavourable = 0)

Y_5 = borrowing rate of interest to agriculture (per annum borrowing rate in %)

Y_6 = Processing know-how (dummy: Yes = 1, No = 0)

Y_7 = Availability of credit to local poultry farmers (dummy: Yes = 1, No = 0)

Y_8 = Disease outbreaks (dummy: Yes = 1, No = 0)

Y_9 = Distance from the consuming market (in kilometers)

Y_{10} = Technical support (dummy: Yes = 1, No = 0)

U_t = Error term

Before carrying out the multiple regression analysis, the relationships between the dependent variables D_{LP} and S_{LP} and each explanatory variable were examined by drawing scatter graphs for linear, quadratic and cubic forms. The relationships between D_{LP} and S_{LP} and all explanatory variables were observed to be linear. Only their linear terms were, therefore, included in the model.

Using Linear Multiple Regression Model to Estimate Demand and Supply of Locally Processed Poultry Meat

In multiple regressions, a linear composite of explanatory variables is formed in such a way that it has maximum correlation with a criterion variable. This technique is appropriate when the researcher has a single, metric criterion variable which is supposed to be a function of other explanatory variables. The main objective in using this technique is to predict the variability of the dependent variable based on its covariance with all the independent variables. One can predict the level of the dependent phenomenon through multiple regression analysis model, given the levels of independent variables. Given a dependent variable, the linear-multiple regression problem is to estimate constants. (Kothari, 2004)

Information on both quantitative and qualitative variables was collected to estimate the demand and supply functions for this study. Different forms of the regression analysis were tried but based upon model fitness criteria; multiple linear form of the regression was found the most suitable (Chattarjee & Price,

2000). Again, in 2010, Ghafoor et al also used linear multiple regression model to estimate demand and supply of poultry meat in Pakistan.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

This chapter presents the results of the study. The results presented are categorized with headings that make the sub-headings in the chapter. Among the sub-headings discussed are: social and demographic characteristics of poultry farmers, sellers and consumers of poultry meat costs on inputs (labour, medication, feed and energy), identification of production constraints, ranking results for constraints and specific model results and interpretation.

Social and Demographic Characteristics of Poultry Farmers

The study focused on the age distribution of poultry farmers for reasons such as finding out whether the poultry industry has been the preserve of a particular age group or it is an enterprise that embraces all sorts of age groups which to a larger extent determines the attractiveness of the industry in the study area.

Table 14 presents the age distribution of the poultry farmers interviewed for this study. The Table reveals that the majority (86.1%) of the farmers were between the age group of 20 – 50 years. According to SRID-MOFA (2011), ages between 15 and 49 are known as the Economically Active Population age group; hence, about 86% of the poultry farmers interviewed for this study were economically active. However, the modal age group of the poultry farmers

interviewed was within the age group of 41-50 (36.1%) years which indicates that the poultry industry is not all that attractive to those below the age of 40 years who constitute the bulk of the work force. Also, the Table reveals that the poultry business is not attractive to the too aged who are above the age of 60 years. 6 (16.7%) of the farmers were within the age group of 20 – 30 years, 12(33.3%) were within the age group of 31–40 years, 13(36.1%) of the respondents were within the age group of 41 – 50, 2(5.6%), 2(5.6%) falling within the age group of 61 -70 years and 1(2.8%) being above the age of 70 years.

Table 14: Age and Sex Distributions of Poultry Farmers

Age Distribution			Sex Distribution		
Age group (Years)	Frequency	Percent	Sex	Frequency	Percent
20-30	6	16.7	Male	33	91.7
31-40	12	33.3			
41-50	13	36.1			
51-60	2	5.6	Female	3	8.3
61-70	2	5.6			
>70	1	2.8			
Total	36	100.0	Total	36	100.0

Source: Field data, 2009

Also, Table 14 presents the details of the sex distributions of the poultry farmers interviewed. The table shows that generally, the poultry industry is predominantly a male job. Out of the 36 poultry famers interviewed, 33(91.7%) were males and the females and the females were 3(8.3%).

Prior Professional Experience and Educational Level Distribution of Poultry Farmers

As Table 15 depicts, the poultry birds raising business is dominated by people who have had some form of formal education. The levels of formal education range from the basic level to the tertiary level. The modal level of education of poultry farmers interviewed was the secondary school level which accounted for 14(38.9%) of the poultry farmers. 9(25.0%) of the respondents were educated up to the Middle School level or Junior Secondary school level, 4(11.1%) were graduates of the Teacher Training college, 8(22.2%) being graduates of tertiary institutions and only 1(2.8%) of the poultry farmers had no formal education. The sort of technicalities associated with the poultry business such as feed formulation, medication, assessment of health condition of poultry birds and determining meat quality might have accounted for the high level of educated people engaged in the poultry business.

Out of the 36 poultry farmers interviewed, 21(58.3%) were people who had no prior professional poultry farming training before entering poultry farming. 15(41.7%) of the poultry farmers had prior professional training before entering poultry farming. This suggests that the majority of the poultry farmers had no prior professional poultry farming training before entering poultry farming as shown in Table 15.

Table 15: Prior Professional Experience and Educational Level Distributions of Poultry Farmers

Prior Professional Experience Distribution			Educational Level Distribution		
Professional or not	Frequency	Percent	Educational level	Frequency	Percent
Not professional	21	58.3	No formal education	1	2.8
Professional	15	41.7	MSLC/JSS	9	25.0
			Secondary School	14	38.9
			Training College	4	11.1
			Tertiary	8	22.2
Total	36.0	100.0	Total	36	100.0

Source: Field data, 2009

Table 16 shows that 23(63.9%) of the poultry farmers interviewed did not engage in any other income generating activities apart from poultry farming whilst 13(36.1%) of the poultry farmers engaged in other income generating activities apart from poultry farming. From this, the majority of the poultry farmer respondents engaged in full time poultry farming.

Table 16: Poultry Farmers Engaging in Poultry Farming on Full Time or Part- Time Basis

Part – time or full time poultry farming	Frequency	Percent
Full –time poultry farming	23	63.9
Part –time poultry farming	13	36.1
Total	36	100.0

Source: Field data, 2009

The Type of Birds Kept and the Distribution of Scale of Production by Poultry Farmers

On the type of poultry birds kept by poultry farmers, Table 17 shows that out of 36 poultry farmers interviewed, 35(97.2%) farmers solely kept chicken whereas 1(2.8%) respondent kept guinea fowls in addition to the chicken. From the above, the poultry industry is dominated by chicken.

On the number of birds kept by poultry farmers interviewed and its categorization in terms of scale of production, 27(75.0%) of the farmers' number of birds were below 5,000 and fell into the 'small scale' category, 3(8.3%) of the farmers' number of birds was between 5,000-10,000 and fell under the 'medium scale' category whereas 6(16.7%) of the farmers had the number of birds kept being above 10,000 and fell under the 'large scale' category as depicted by Table 17.

Table 17: The Type of Birds Kept and the Distribution of Scale of Production by Poultry Farmers

Type of Birds Kept			Scale of Production		
Type of Birds Kept	Frequency	Percent	Scale and number of birds kept	Frequency	Percent
Chicken	35	97.2	Small scale(<5000)	27	75.0
Chicken & Guinea fowl	1	2.8	Medium scale(5,000-10,000)	3	8.3
			Large scale(>10,000)	6	16.7
Total	36.0	100.0	Total	36.0	100.0

Source: Field data, 2009

Type of Poultry Enterprise Kept by Farmers

From Table 18, it is clear that the poultry industry is dominated by layer birds which were kept by 18(50.0%) of the respondents. These layer birds come into the poultry meat business after they have finished or about to finish laying and become spent layers. Those farmers who were solely into broiler raising were 3(8.3%) and 15(41.7%) of the respondents kept both broiler and layers. The reason for the dominance of the layers in the poultry industry could be attributed to the cheap poultry meat imports and high input cost making broiler production unattractive to poultry farmers.

Table 18: Distribution of Poultry Enterprise Kept by Farmers

Poultry enterprise	Frequency	Percent
Broiler	3	8.3
Layer	18	50.0
Both broiler and layer	15	41.7
Total	36	100.0

Source: Field data, 2009

Processing Capacity of Poultry Farmers

On the processing capacity of poultry farmers, out of 36 respondents, 30(83.3%) of the poultry farmers did not process poultry meat at all but sold live birds. Reasons cited by those respondents for not processing poultry meat were customers' preference for live birds, high electricity bills, high processing cost, lack of processing equipment, lack of storage facilities, lack of processing know-how and others not willing to go into processing of poultry meat at all.

The result also shows that 1(2.8%) of the respondents completely process poultry meat, whereas 5(13.9%) of the respondents sell live birds and also process poultry meat as well. As depicted by Table 19, the poultry industry is highly dominated by farmers who sell live birds as compared to those who process the meat for the market.

Table 19: Poultry Farmers Who Process and Do not Process Poultry Meat

Producers processing and not processing	Frequency	Percent
Process poultry meat	1	2.8
Sell live birds	30	83.3
Process and sell live birds	5	13.9
Total	36	100.0

Source: Field data, 2009

Comparison of Price of Locally Produced Poultry Meat to that of Imported Poultry Meat

In comparing the prices of locally processed poultry meat to that of imported processed poultry meat, the majority of poultry farmers agreed that the price of locally processed poultry meat was relatively costly than that of imported processed poultry meat. Farmers who said that locally processed poultry meat was more expensive cited high local production cost, low tariffs on imported poultry meat, subsidies from governments for poultry production abroad and these situations being non-existent in Ghana; hence, locally produced poultry meat being more costly than imported poultry meat. There was a general consensus amongst the poultry farmers that locally processed poultry meat was more costly than imported processed poultry meat.

Sources of Funding for Producers' Poultry Business

On the sources of credit for poultry business, 12(33.3%) of the farmers cited the bank or the government as source of credit for their business whereas 17(47.2%) also depended on personal or family sources for funding for their productions. Those who depended on both bank and government and personal or family sources for funding were 7(19.4%) of the farmers. It is therefore depicted by Table 20 that the majority of the farmers depended on bank/government family sources for funding of their productions.

Table 20: Producers' Sources of Funding for their Poultry Businesses

Sources of funding	Frequency	Percent
Bank or government	12	33.3
Personal or family	17	47.2
Both bank or government and personal or family	7	19.4
Total	36	100.0

Source: Field data, 2009

Producers' Perception on Impact of Tariff on Imported Poultry Meat on Local Production

On the effect of tariffs imposed on imported processed poultry meat on local poultry production, 33(91.7%) of the poultry farmers responded that it had a positive effect on the local poultry production. However, 3(8.3%) of the farmer respondents disagreed that imposition of tariffs on imported processed poultry meat impacted positively on local poultry production. Poultry farmers who saw something positive about the imposition of tariffs on imported

processed poultry meat cited restriction on the quantity of imported poultry meat which in turn boosts demand for locally processed poultry meat. Those farmers who expressed divergent view about the positive impact of tariffs imposed on imported processed poultry meat on local poultry production said that the tariff percentage imposed was insignificant hence its inability to deter importation of processed poultry meat to any meaningful extent as presented on Table 21.

Table 21: Producers' Perception on Impact of Tariffs on Imported Poultry Meat on Local Production

Perception	Frequency	Percent
Positive	33	91.7
Negative	3	8.3
Total	36	100.0

Source: Field data, 2009

Producers' Satisfaction with the 20% Tariff on Imported Poultry Meat

As presented on Table 22, 7(19.4%) of the farmer respondents were satisfied with the current 20% tariff imposed on imported processed poultry meat. However, the majority of the farmers, representing 29(80.6%), were not satisfied with the current 20% tariff imposed on imported poultry meat by government.

Table 22: Producers' Satisfaction with the 20% Tariff on Imported Poultry Meat

Satisfaction	Frequency	Percent
Satisfied	7	19.4
Not satisfied	29	80.6
Total	36	100.0

Source: Field data, 2009

The Ideal Percentage Tariff Suggested by Producers for Imported Poultry Meat

The ideal percentage tariff suggested by respondents ranged between 10 – 100 %. The majority of the respondents suggested percentage tariffs higher than 35%. It can be concluded that the majority of the poultry meat producers were not satisfied with the current (i.e. 2009) 20% tariff on imported poultry meat.

Poultry Meat Processing Know-how and Possession of Processing Equipment by Poultry Farmers

On poultry meat processing know-how of poultry farmers, the majority of the farmer respondents had no poultry meat processing know-how. Those farmers with poultry meat processing know-how said that they acquired the know-how from a friend poultry farmer, through schooling, training workshops and seminars. Those with the processing know-how intimated that the know-how had really helped them to process poultry meat to suit the taste of consumers.

Thirty two poultry farmers (88.9%) of the farmer respondents did not possess poultry meat processing equipment which implied that those poultry farmers did not process the poultry meat they produced but rather sold live birds to consumers who rather did the processing. Four (11.1%) farmer respondents had poultry meat processing equipment. This gives credence to the fact that only few poultry farmers process the poultry meat they produce for the market as depicted by Table 23.

Table 23: Possession of Poultry Meat Processing Equipment by Poultry Farmers

Possession of processing equipment	Frequency	Percent
Possess processing equipment	4	11.1
Do not possess processing equipment	32	88.9
Total	36	100.0

Source: Field data, 2009

Impact of Transportation Cost on Production

From Table 24, it can be seen that 26(72.2%) of the farmers responded that the cost of transporting their produce to the market centres had no effect on their levels of production and also profit margins but 10(27.8%) of the farmers agreed that transportation cost had effect on their levels of production and also profit margins.

Table 24: Impact of Transportation Cost on Levels of Production and Profit Margins

Impact	Frequency	Percent
No impact	26	72.2
Has impact	10	27.8
Total	36	100.0

Source: Field data, 2009

Availability of Technical Support for Poultry Production

On the availability of technical support for poultry farmers from the Ministry of Agriculture, an agency or NGO, 26(72.2%) respondents confirmed that they had been receiving a kind of technical support from the Ministry of

Agriculture, an agency or NGO on production and management practices. These farmers said the technical support impacts positively on their productions. 9(25.0%) respondents do not receive any technical support from the Ministry of Agriculture, an agency or NGO and this did not help them in their productions. They said that this made it difficult to deal with certain situations that cropped up on their farms where they did not have any idea about the solutions to the situations. 1(2.8%) respondent could not tell whether technical support from the Ministry of Agriculture, an agency or NGO was available or not. This is presented on Table 25.

Table 25: Availability of Technical Support for Poultry Farmers

Availability of technical support	Frequency	Percent
Receive technical support	26	72.2
No technical support	9	25.0
No response	1	2.8
Total	36	100.0

Source: Field data, 2009

Cost of Inputs (Labour, Feed, Medication and Energy)

The poultry farmers sampled for this study were asked to state the average monthly expenditure or cost incurred on inputs such as labour, feed, medication and energy. The average percentage contribution of monthly labour cost to the average total monthly inputs cost of all the farmers sampled was 19.5% as Table 25 depicts. The average percentage contribution of monthly feed

cost to the average total monthly inputs cost of all the farmers sampled was 69.0%.

Further with respective cost of labour, feed, medication and energy incurred by farmers in a month, the average percentage contribution of monthly medication cost to the average total monthly inputs cost of all the farmers sampled was 9.0%.

On energy, the percentage contribution of monthly energy cost to the average total monthly inputs cost of all the farmers sampled was 2.5% as presented on Table 26.

Table 26: Weighted Average Percentage Contribution of each Input's Monthly Cost to the Total Average Inputs Cost

Input	Weighted average % contribution of a particular input cost to average total monthly inputs cost
Labour	19.5
Feed	69.0
Medication	9.0
Energy	2.5
Total	100

Source: Field data, 2009

Identification of Production Constraints by Poultry Farmers

The poultry farmers that were selected for the survey were asked to state the constraints they encounter in their quest to produce locally processed poultry meat. Table 27 presents the constraints identified and the corresponding number of poultry farmers.

Table 27: Constraints Identified by Poultry Farmers

Constraints Identified	Number of Farmers	Percent
1.Price of locally processed poultry meat	33	91.6
2.Price of imported processed poultry meat	36	100
3.Average cost of inputs	36	100
4.Government policy in terms of tariffs on imported poultry meat	26	72.2
5.Borrowing rate of interest to agriculture	30	83.3
6.Processing know-how	31	86
7.Availability of credit to poultry farmers	27	75
8.Distance from the consuming market	20	55.5
9.Technical support	18	50
10.Disease outbreaks	29	80.5

n = 36

Source: Field data, 2009

Ranking of Constraints to Production of Locally Processed Poultry Meat by Poultry Farmers

The poultry farmers (poultry meat producers) were asked to rank the constraints to the production of locally processed poultry meat identified in order of severity on a scale of 10 to 1 with 10 being the most severe and 1 being not severe. The rankings by the poultry farmers are presented in Appendix D. The total rankings and the positions assigned to the constraints are presented in Table 28.

Table 28: Rank Totals of Constraints

Constraints	**Rank Totals**	**Position**
1.High average cost of inputs	296	1st
2. Low tariffs on imported poultry meat	252	2nd
3 High borrowing rates of interest	243	3rd
4. Relative cheaper prices of imported poultry meat	237	4th
5.Relative higher prices of locally processed poultry meat	235	5th
6. The unavailability or difficulty in accessing credit	204	6th
7.Lack of processing know-how	186	7th
8.Disease outbreak	133	8th
9.Lack of technical support	98	9th
10.Distance from the consuming market	85	10th

n = 36
Source: Field data, 2009

Degree of Agreement of Rankings by Poultry Farmers

The degree of agreement of rankings by poultry meat producers was computed by using the Kendall's Coefficient of Concordance, W. It is expressed as: $W = \frac{S}{\frac{1}{12}k^2(n^3-n)}$;and $S = \sum(SR)^2 - n\left(S\tilde{R}\right)^2$

From Table 28, S = $(296)^2$ + $(252)^2$ + $(243)^2$ + $(237)^2$ + $(235)^2$ + $(204)^2$ + $(186)^2$ + $(133)^2$ + $(98)^2$ + $(85)^2$ - $10(196.9)^2$ = 44596.9. Hence, $W = \frac{44596.9}{\frac{1}{12}*1296(1000-10)}$

W = 0.42. This implies that W is 42% and hence indicates a fair agreement by poultry farmers as to the order of severity of the constraints to the production of locally processed poultry meat.

Test of Hypothesis

H_0: W = 0 (there is no agreement as to the order of severity of rankings by producers)

H_1: W = 0 < W≤ 1 (producers are in a fair agreement as to the order of rankings of severity).

Here, n > 7 and as such the null hypothesis is tested by employing the Friedman's Chi-Square (χ^2) statistic. It is computed by the formula expressed below:

χ^2 = 36(10 – 1) 0.42

χ^2 = 136.08

Statistical and Non-Statistical Conclusions

Tabulated χ^2 at 1 percent probability with 9 degrees of freedom is 21.7. Since $\chi^2_{cal} > \chi^2_{crit}$, we reject the null hypothesis of no significant agreement of ranks. Therefore, poultry farmers were in a fair agreement as to the order of ranks hence poultry farmers in the study area perceived the constraints similarly in terms of severity and their influence on their production.

Estimation of Supply

The OLS regression results for estimated supply of locally processed poultry meat are presented in Table 29.

Table 29: Summary of Supply Function for Locally Processed Poultry Meat

Variables	Coefficients	t-value	
Constant	2.1663	1.11	
Distance from the consuming market	-0.0090	-0.32^{NS}	
Government policy on tariffs	-0.0247	-0.04^{NS}	
Borrowing rate of interest to agriculture	0.0038	0.11^{NS}	
Technical Support	-0.4433	-0.99^{NS}	
Average cost of inputs	-0.3475	-1.97*	
Price of imported poultry meat	0.2395	0.85^{NS}	
Price of locally processed poultry meat	0.1818	2.22**	
Availability of credit to local poultry farmers	0.1474	0.31^{NS}	
Disease outbreaks	-1.0146	2.56***	
Processing know-how	0.3004	0.66^{NS}	
Model Summary			
R^2	Adjusted R^2	F	p- value
0.54	0.51	2.23	0.05

*** = significant ($p < 0.01$), ** = significant ($p < 0.05$), * = significant ($p < 0.1$), NS = Not significant.
Source: Field data, 2009

From Table 29, it can be seen that the distance of the place of producing locally processed poultry meat from the consuming market did not affect the producer's decision to process and take the produce to the market or sell live birds at the farm. This outcome is in line with the research finding of Ghafoor *et al.* (2010).

The borrowing rate of interest also had the expected sign of negative (-). The reason could be that because the farmers mentioned the unavailability of credits for their production, they did not see the rate of interest on credits advanced to poultry farmers as a major factor in their decisions to supply locally processed poultry meat. This is contrary to the finding of Akanni (2007), that high interest rate impacts significantly on poultry meat production.

Technical support such as veterinary services, extension services and training workshops was statistically non significant in this study. Though the coefficient did not have the expected sign (+), which would have meant that provision of technical support positively affects the production of locally processed poultry meat. This factor not being statistically significant is similar to the finding of Adebayo and Adeola (2005).

The average cost of inputs was significant ($p < 0.10$). The coefficient (-0.3475) means that a GH¢ 1 increase in the average cost of inputs would result in an average reduction in the supply of locally processed poultry meat by 0.3475 Kg. Similar findings were made by Ghafoor et al. (2010), Adebayo and Adeola (2005) and Ja'afar-Furo & Gabdo(2010) in other countries.

The coefficient of price of imported poultry meat was 0.2395, which means that the price of imported has positive effect on the supply quantity of locally processed poultry meat. As per economic theory, imported poultry meat, being the closest substitute for locally processed poultry meat, there is a direct relationship between the price of imported poultry meat and the supply quantity of locally processed poultry meat. In practical terms, especially in Ghana, that is not the case. The reason is that in Ghana, the price of imported poultry meat is always cheaper compared to that of the locally produced poultry meat that an increase in the price of imported poultry meat will not serve as an incentive for the poultry farmer to supply more locally processed poultry meat over a period. Though the coefficient of price of imported poultry meat had the expected sign as far as theory is concerned, this variable was statistically non-significant contrary to the finding of FAO (2010).

Own-price of locally processed poultry meat was statistically significant ($p < 0.05$) in this study. The coefficient (0.1818) means that a GH¢ 1 increase in the price of locally processed poultry meat would result in 0.1818 Kg increase in the supply of locally processed poultry meat. This is in line with economic theory that an increase in price of commodity leads to an increase in the supply quantity of the commodity over a period.

Availability of credit to local poultry farmers has positive impact on the supply of locally processed poultry meat but in this study, this variable is non significant in its effect on the supply of locally processed poultry meat. The non significance of this variable is contrary to the research finding of Akanni (2007)

that availability of credit impacts significantly on the production decisions of poultry farmers.

Disease outbreak had significant ($p < 0.01$) effect on the supply of locally processed poultry meat in the study area. The coefficient (-1.0146) has the expected sign (-). Similar research finding was made by Ghafoor et al. (2010) in terms of the significance of this variable in affecting supply decisions of poultry meat producers.

Know-how or experience in processing local poultry meat was statistically non-significant in this estimation. This is contrary to the research finding of Ghafoor *et al*. (2010) where Know-how or experience was significant in influencing the supply of poultry meat.

The value of Adjusted R^2 in the supply estimation was 0.509 which implies that the independent variables included in the supply model for locally processed poultry meat explained about 51% variation in the dependent variable. The p-value (0.05) of the regression model shows that the model fit the data set, thereby showing the correct specification of the model.

The Way Forward Suggested by Poultry Farmers

Opportunities to boost the trade of locally processed poultry meat were sought from the producers interviewed. Producers' suggestions on the ways to boosting the production of locally processed poultry meat are categorized under the role of consumers, producers and government respectively.

Consumers' role:

a). Have positive perception about locally processed poultry meat and patronize locally processed poultry meat

Producers' roles:

a). Seek financial assistance in the form of loan/credit to expand the scale of production

b). Acquire equipment for processing local poultry meat and seek technical know-how on poultry meat processing

c). Study the taste, packaging and product preferences of consumers and produce to meet that

Government's roles:

a). Provide poultry farmers with subsidies on agricultural inputs such as feed, medicine and electricity

b). Highly increase tariffs on imported processed poultry meat

c). Provide credit/loan facilities to local poultry farmers

d). Reduce considerably, taxes on imported poultry meat processing equipment and support poultry farmers to acquire poultry meat processing equipment.

Social and Demographic Characteristics of Poultry Meat Consumers

Out of 108 consumers of poultry meat interviewed in the study area, the majority of the respondents representing 58 (53.7 %) were females whereas males constituted the minority of consumers which accounted for 50 (46.3%) of respondents. As it is clearly depicted by Table 30, the consumption of poultry meat is dominated by females.

Table 30: Sex and Educational Level Distributions of Poultry Meat Consumers

Sex Distribution			Educational Level Distribution		
Sex	Frequency	Percent	Educational Level	Frequency	Percent
Male	50	46.3	No formal education	8	7.4
Female	58	53.7	MSLC/JSS	31	28.4
			SSS	29	26.9
			Training College	7	6.5
			Tertiary	26	24.1
			Others	7	6.5
Total	108.0	100.0	Total	108.0	100.0

Source: Field data, 2009

On the educational levels of poultry meat consumers interviewed, the levels ranged between those who had no formal education at all to the tertiary education levels. Eight(7.4 %) respondents had no formal education at all, 31 (28.7 %) were educated up to the Middle School or Junior Secondary School level, 29 (26.9 %) were educated up to the Senior Secondary School level ,7 (6.5 %) of respondents went through the Teacher Training College,26 (24.1%) of consumer respondents had formal education up to the tertiary level and 7 (6.5 %) of the respondents had other forms of formal education which included Commercial, Vocational, Technical and Agricultural Training Colleges. It can be deduced from Table 30 that poultry meat is consumed by all sort of people

with different levels of education and those with no formal education at all. This means that poultry meat is attractive to all sorts of consumers and not a particular level in terms of education as presented on Table 30.

Out of 108 consumers, the majority of them representing 63 (58.3 %) were married, whereas 41 (38.0 %) being those not married before, 1 (0.9 %) divorcee and 3 (2.8%) being widow or widower as presented on Table 31.

On the basis of categorizing poultry meat consumers according to the consumers' profession, it can be seen from Table 31 that poultry meat is consumed by a range of professionals including those without a specific profession. 24(22.2%) of the respondents were teachers, 6(5.6 %) are agriculturists, 2 (1.9 %) being accountants, 2(1.9%) into banking, 3 (2.8 %) are students, 14(13.0%) being artisans comprising seamstresses, tailors, masons, carpenters, plumbers and the modal profession of consumers being the 'others' categorization which included contractors, cooks, farmers, traders and other professions respondents could not specify.

Table 31: Marital Status and Profession Distributions of Poultry Meat Consumers

Marital Status Distribution			Profession Distribution		
Marital Status	Frequency	Percent	Profession	Frequency	Percent
Married	63	58.3	Teaching	24	22.2
Not married before	41	38.0	Agriculture	6	5.6
Divorced	1	0.9	Accounting	2	1.9
Widow or Widower	3	2.8	Banking	2	1.9
			Artisan	14	13.0
			Student	3	2.8
			Others	57	52.8
Total	108.0	100.0	Total	108.0	100.0

Source: Field data, 2009

Family Size Distribution and Average Quantity of Poultry Meat Consumed by Consumers

The size of the families of the poultry meat consuming respondents ranged between one-member families to nine-member families .The modal family size of poultry meat consumers was 4 –member family size. This means poultry meat was consumed within different family sizes as depicted by Table 32.

The average monthly quantities of poultry meat consumed by the various family sizes of consumers ranged between 1 pound and 8 pounds. There was a positive correlation between the family size and the quantity consumed. The bigger the family size, the higher the average monthly quantity of poultry meat consumed and vice versa. Averagely, 2 pounds of poultry meat per month was the quantity that the majority (40 or 37.0 %) of the families consumed.

Table 32: Family Size Distribution and Monthly Average Quantities of Poultry Meat Consumed by the Consuming Families

Family Size Distribution			Monthly Average Quantities Consumed		
Family Size	Frequency	Percent	Quantity(pounds)	Frequency	Percent
1	7	6.5	1	12	11.1
2	8	7.4	1.5	2	1.9
3	18	16.7	2	40	37.0
4	47	43.5	2.5	1	0.9
5	15	13.9	3	26	24.1
6	11	10.2	4	12	11.1
7	1	0.9	5	6	5.6
9	1	0.9	6	6	5.6
			8	3	2.8
Total	108.0	100.0	Total	108.0	100.0

Source: Field data, 2009

Price of Locally Produced Poultry Meat

According to the consuming sample interviewed, the price they paid for a pound of locally processed poultry meat ranged between GH¢ 2 and GH¢ 4.5 depending on the season. Consumers pay higher prices for poultry meat in seasons like Christmas, Easter and other festive occasions. A higher number of consumers bought a pound of locally processed meat at an average price of GH¢ 3.

Affordability of Locally Produced Poultry Meat

Out of the total of 108 consumers sampled, 18 (16.7%) of the consumers had a problem with the affordability of the average prices at which they bought a pound of locally processed poultry meat. However, the majority (89 or 82.4 %) of the consumers could afford the average prices at which they bought a pound of locally processed poultry meat. One consumer (0.9%) could not tell whether the average price at which a pound of locally processed poultry meat was sold was affordable or not. These are presented on Table 33.

Table 33: Affordability of the Average Price of One Pound of Locally Processed Poultry Meat to Consumers

Price affordability	Frequency	Percent
Affordable	89	82.4
Not affordable	18	16.7
Could not tell	1	0.9
Total	108	100.0

Source: Field data, 2009

Effect of Income on Quantity of Poultry Meat Consumed

Out of 108 respondents, 40 (37.0 %) disagreed that their average quantity of poultry meat consumed monthly was influenced by their levels of monthly income. This means their quantity of poultry meat consumed monthly was irrespective of the incomes obtained within the month. However, the majority of respondents, 64 (59.3%) agreed that their monthly incomes had bearing on the average quantity of poultry meat consumed and affirmed that the correlation between their monthly incomes and the average monthly quantity of poultry meat consumed was a positive one. Hence, the higher their monthly incomes, the more poultry meat consumed within the month. Four(3.7%) of the consumers of poultry meat could not tell whether their average quantities of poultry meat consumed within a month were influenced by their average monthly incomes or not as presented on Table 34.

Table 34: Consumers' Perception on Impact of Income on the Quantity of Poultry Meat Consumed

Impact of income on quantity of poultry meat consumed	Frequency	Percent
Positive impact	40	37.0
No impact at all	64	59.3
Could not tell	4	3.7
Total	108	100.0

Source: Field data, 2009

Place of Residence of Consumers in Terms of Urban or Rural Area about Ten Years Ago

In an attempt to find out the place of residence of consumers in terms of urban or rural area about ten years ago ,81(75.0%) of consumers lived in the urban area about ten years ago whereas 27 (25.0%) lived in the rural area about ten years ago. From this, as depicted by Table 35, the majority of consumers interviewed were in the urban areas about ten years ago.

Table: 35: Place of Residence of Consumers in Terms of Urban or Rural Area about Ten Years Ago

Place of residence ten years ago(urban/rural)	Frequency	Percent
Urban area	81	75.0
Rural area	27	25.0
Total	108	100.0

Source: field data, 2009

Comparison of the Effects of Place of Residence and Income on Poultry Meat Consumption

With the current places of residence of consumers whether urban or rural, 106 (98.1%) of respondents were staying in the urban areas during the time of data collection and 2 (1.9%) were staying in the rural area. Out of the 108 consumers sampled, 82(75.9 %) them affirmed that there had been an increase in their respective monthly incomes compared to what pertained about ten years ago from the time of data collection, 16 (14.8 %) of the consumers denied an increase in their average monthly incomes compared to the situation about ten years ago whereas 10 (9.2 %) could not tell whether there had been an

increase or decrease in their current monthly incomes compared to their incomes ten years ago.

To ascertain whether place of residence and monthly income have impact on the quantity of poultry meat consumed by an individual, 60 (55.6%) of the consumers said that there has been an increase in the quantity of poultry meat they currently consume compared to the quantity they used to consume about ten years ago. 5(23.1%) of the consumers refused to accept that there had been an increase in the monthly quantity of poultry meat consumed currently compared to the monthly quantity consumed about ten years ago. However, 23(21.3%) could not tell whether there has been an increase or decrease in the monthly quantity of poultry meat consumed currently compared to the quantity they used to consume about ten years ago. In all, it is depicted by Tables 35 and 36 that there had not been any change in the place (urban) of residence of the majority of the consumers interviewed for about ten years at the time of data collection. Also, the majority of the consumers agreed that there had been an increase in the quantity of poultry meat consumed currently compared to the quantity they were consuming about ten years ago. In addition, the majority of the consumer respondents responded that there had been an increase in their incomes currently compared to their incomes about ten years.

Table 36: Comparison of Consumers' Place of Residence, Income and their Impact on Poultry Meat Consumption

Current place of residence	Frequency	Percent	Income increase/ decrease	Frequency	Percent	Quantity of poultry meat consumed	Frequency	Percent
Urban	106	98.1	Increase	82	75.9	Increase	60	55.6
Rural	2	1.9	Decrease	16	14.8	Decrease	25	23.1
			Could not tell	10	9.2	No change	23	21.3
Total	108	100.0	Total	108	100.0	Total	108	100.0

Source: Field data, 2009

Type of Poultry Meat (Processed or Unprocessed) Consumers Normally Purchase

From Table 37, the majority of consumer respondents representing 84(77.8%) said that they always bought processed poultry meat for cooking and 24 (22.2%) bought unprocessed or live birds and processed before cooking with it.

Table 37: The Form in Which Consumers Obtain their Poultry Meat

Form of meat (processed or unprocessed)	Frequency	Percent
Processed	84	77.8
Unprocessed	24	22.2
Total	108	100.0

Source: Field data, 2009

The Level of Consumption of Poultry Meat by Consumers

Out of the 108 consumers interviewed, 4 (3.7 %) of the poultry meat did not consume any other meat apart from poultry meat but 104(96.3%) of the consumers of poultry meat interviewed consumed other meats apart from poultry meat. These other meats they consumed apart from poultry meat included beef, mutton chevon, game and pork. This means that poultry meat had several substitutes which make the poultry meat trade very competitive. The competitive advantage that poultry meat has over the other meat substitutes in terms price because poultry meat is cheaper compared to the average prices of the other meat substitutes.

Preference of Consumers for either Locally Produced or Imported Poultry Meat

The majority, 80(74.1%), of the consumers interviewed said they preferred locally processed poultry meat to imported processed poultry meat whereas 28 (25.9 %) of the consumer respondents preferred imported processed poultry meat to locally processed poultry meat as depicted by Table 38.

Table 38: Consumers' Preference for a Type of Poultry Meat Based on Place of Origin

Preference (based on origin)	Frequency	Percent
Locally processed poultry meat	80	74.1
Imported processed poultry meat	28	25.9
Total	108	100.0

Source: Field data, 2009

Availability of Locally Produced Poultry Meat on the Market

Though the majority of consumers interviewed preferred locally processed poultry meat to imported processed poultry meat, the majority (81 or 75.0%) of the consumer respondents ended up commonly buying imported processed poultry meat and the reason being that the locally processed poultry meat was virtually unavailable on the market. 27 (25.0%) of the consumer respondents commonly bought locally processed poultry meat on the market as presented by Table 39.

Table 39: The Type of Poultry Meat Consumers Commonly Buy Based on Origin

Type of poultry meat	Frequency	Percent
Locally processed poultry meat	27	25.0
Imported processed poultry meat	81	75.0
Total	108	100.0

Source: Field data, 2009

The Parts of Poultry Meat Consumers Consume

On the parts of poultry meat commonly purchased by consumers, 17(15.7%) of consumers commonly bought a full chicken, 14(13.0%) bought wings, 46(42.6%) bought thighs, 2(1.9%) bought drumstick, 4(3.7%) bought gizzard, 1(0.9%) bought breast, 10(9.3%) commonly bought wings, thighs and drumstick combined,7(6.5%) commonly bought gizzard, thighs and breast combined and 7(6.5%) commonly bought wings, thighs and back combined. As depicted by Table 40, the poultry meat part that the majority of consumers bought was the thigh and this was in line with the findings of Asuming-Brempong *et al*. (2006).

Table 40: Parts of Poultry Meat Commonly Bought by Consumers

Poultry meat parts	Frequency	Percent
Full chicken	17	15.7
Wings	14	13.0
Thighs	46	42.6
Drumsticks	2	1.9
Gizzard	4	3.7
Breast	1	0.9
Wings, thighs, drumstick	10	9.3
Gizzard, thighs, breast	7	6.5
Wings, thighs, back	7	6.5
Total	108	100.0

Source: Field data, 2009

Out of the 108 consumers sampled for this study, 13(12.0%) of the consumers expressed dissatisfaction with parts of poultry meat they bought from the market whereas 95(88.0%) of the consumers expressed satisfaction with the parts of poultry meat they purchased from the market as Table 41 depicts.

Table 41: Consumers' Satisfaction with Parts of Poultry Meat Purchased

Satisfaction	Frequency	Percent
No satisfaction	13	12.0
Satisfaction	95	88.0
Total	108	100.0

Source: Field data, 2009

Taste as a Factor in Poultry Meat Consumption

On consumers response to the factors that they considered in their choice for poultry meat, 92(85.2%), which constituted the majority of respondents, cited taste of poultry meat as a factor in their choice for poultry meat but 16 (14.8%) of the consumers did not consider taste as a factor in their choice of poultry meat but other factors as presented in Table 42.

Table 42: Consideration of Taste as a Factor in Consumers' Choice of Poultry Meat

Taste consideration	Frequency	Percent
Consider taste	92	85.2
Not consider taste	16	14.8
Total	108	100.0

Source: Field data, 2009

Health as a Factor in Poultry Meat Consumption

The majority of the consumer respondents, 77(71.3%), considered health issues in their choice for poultry meat and 31(28.7%) did not make health considerations a factor in their choice of poultry meat as presented in Table 43.

Table 43: Consideration of Health Issue as a Factor in Consumers' Choice of Poultry Meat

Health Consideration	Frequency	Percent
Consideration	77	71.3
No consideration	31	28.7
Total	108	100.0

Source: Field data, 2009

Religion as a Factor in Poultry Meat Consumption

As Table 44 depicts, the majority, 93(86.1%), of the consumer respondents said that their choice of poultry meat was not affected by their religious beliefs or considerations but on the contrary, 15(13.9%) of the consumer respondents affirmed that their choice for poultry meat hinged on religious considerations.

Table 44: Consideration of Religion as a Factor in Consumers' Choice of Poultry Meat

Religious consideration	Frequency	Percent
Consider Religion	15	13.9
Not consider religion	93	86.1
Total	108	100.0

Source: Field data, 2009

Cultural Belief as a Factor in Poultry Meat Consumption

Out of the 108 consumers interviewed, 97(89.8%) of the respondents said that their choice of poultry meat was not affected by their cultural beliefs or values but on the contrary, 11(10.2%) of the consumer respondents affirmed that their choice of poultry meat was hinged on their cultural beliefs. This is presented on Table 45.

Table 45: Consideration of Cultural Belief as a Factor in Consumers' Choice of Poultry Meat

Cultural beliefs consideration	Frequency	Percent
Consider cultural beliefs	11	10.2
Not consider cultural beliefs	97	89.8
Total	108	100.0

Source: Field data, 2009

Advertisement as a Factor in Poultry Meat Consumption

Out of the 108 consumers interviewed, 76(70.4%) of them said that their choice of poultry meat was not affected by advertisement but 32(29.6%) said that their consumption of poultry meet was affected by advertisement by increasing their quantity of consumption because it helped them to locate where they could get a particular poultry meat that suited their taste and choice as presented in Table 46.

Table 46: Effect of Advertisement on Poultry Meat Consumption by Consumers

Effect of advertisement	Frequency	Percent
Has effect	32	29.6
Has no effect	76	70.4
Total	108	100.0

Source: Field data, 2009

Poultry Disease as a Factor in Poultry Meat Consumption

On the effect of outbreak of poultry disease on consumers consumption of poultry meat, 16(14.8%) of the consumers interviewed responded that their consumption of poultry was not affected any time there was an outbreak of poultry disease(s). Most respondents representing 92(85.2%) said that an outbreak of disease(s) affected their poultry meat consumption negatively whereby they consumed no poultry meat or drastically reduced the quantity of consumption of the supposedly 'diseased' poultry or switched to alternatives as presented by Table 47.

Table 47: Effect of Poultry Disease(s) Outbreak on Poultry Meat Consumption

Effect of disease outbreak	Frequency	Percent
Has effect	92	85.2
Has no effect	16	14.8
Total	108	100.0

Source: Field data, 2009

Consumers' Opinions on the Percentage Tariffs on Imported Poultry Meat

Though an increase in tariffs on imported processed poultry meat will result in an increase in the retail prices of poultry meat which will in the end be borne by the consumer, surprisingly, almost all the consumers interviewed agreed that government should increase the current rate of tariff on imported

poultry meat as a way to boost local production. They suggested tariff rates between 35% and 73%.

Identification of Factors Affecting Locally Processed Poultry Meat Demand

The consumers of poultry meat interviewed for this study were asked to identify factors that influence their demand for locally processed poultry meat. Table 48 presents the factors identified by consumers and the corresponding numbers of consumers.

Table 48: Factors Identified by Poultry Meat Consumers

Factors Identified	Number of Consumers	Percent
1.Taste	100	92.6
2.Health considerations	92	85
3.Price of imported poultry meat	108	100
4.Price of other meat on the market apart from poultry meat	102	94.4
5.Advertisement	80	74
6.Easiness of cooking	65	60
7.Religious consideration	58	53.7
8.Cultural consideration	63	58.3
9.Income of consumers	108	100
10.Proportion of consumer's income spent on poultry meat	104	96.3
11.Price of locally processed poultry meat	108	100

n = 108
Source: Field data, 2009

Ranking of Factors Affecting Demand for Locally Processed Poultry Meat by Poultry Meat Consumers

The poultry meat consumers were asked to rank the factors affecting their demand for locally processed poultry meat identified in order of severity on a scale of 11 to 1 with 11 being the most severe and 1 being not severe. The rankings by the poultry meat consumers are presented in appendix E. The total rankings and the positions assigned to the factors are presented in Table 49.

Table 49: Rank Totals of Poultry Meat Demand Factors Identified by Consumers

Factors Affecting Demand	Rank Totals	Position
1.Relative higher prices of locally processed poultry meat	1160	1st
2.Relative cheaper prices of imported processed poultry meat	1070	2nd
3. Perceived increased income of consumers	952	3rd
4.Price of other meat on the market apart from poultry meat	828	4th
5.Proportion of consumers income spent on poultry meat	768	5th
6. The perceived better taste of locally processed poultry meat	640	6th
7.Health consideration	555	7th
8.Easiness of cooking	389	8th
9.Religious consideration	310	9th
10. Cultural consideration	278	10th
11.Advertisement	151	11th

n = 108
Source: Field data, 2009

Degree of Agreement of Rankings by Poultry Meat Consumers

The degree of agreement of rankings by poultry meat consumers is computed by using the Kendall's Coefficient of Concordance, W. It is expressed as,

$W = \frac{S}{\frac{1}{12}k^2(n^3-n)}$; and $S = \sum(SR)^2 - n\left(S\tilde{R}\right)^2$

From Table 49, S = $(1160)^2$ + $(1070)^2$ + $(952)^2$ + $(828)^2$ + $(768)^2$ + $(640)^2$ + $(555)^2$ + $(389)^2$ + $(310)^2$ + $((278)^2$ + $(151)^2$ - $11(645.5)^2$ = 1153970.25.

Hence, $W = \frac{1153970.25}{\frac{1}{12} * 11664(1331-11)}$

W = 0.899. This implies that W is 89.9% and hence indicates a higher level of agreement by poultry meat consumers as to the order of severity of the factors to the demand of locally processed poultry meat.

Test of Hypothesis

H_0: W = 0 (there is no agreement as to the order of severity of rankings by consumers)

H_1: W = 0 < W≤ 1 (consumers are in agreement as to the order of rankings of severity)

Here, n>7 and therefore the null hypothesis is tested by employing the Friedman's Chi-Square (χ^2) statistic. It is computed by the formula expressed below:

χ^2 = 108(11 – 1) 0.899

χ^2 = 970.92

Statistical and Non-Statistical Conclusions

Tabulated χ^2 at 1 percent probability with 10 degrees of freedom is 23.2. Since $\chi^2_{cal} > \chi^2_{crit}$, we reject the null hypothesis of no significant agreement of ranks. Therefore poultry meat consumers are in a high agreement as to the order of ranks hence poultry meat consumers in the study area perceive the demand factors similarly in terms of severity and their influence on their demand.

Estimation of Demand

The Ordinary Least Square (OLS) regression results for estimated demand for locally processed poultry meat are presented in Table 50.

Table 50: Summary of Demand Function

Variables	Coefficients	t-value
Constant	-0.1980	-0.17
Price of locally processed poultry meat	-0.4402	-2.02**
Income of consumers	0.0076	6.58***
Price of imported poultry meat	0.3201	1.25
Proportion of consumer's income spent on locally processed poultry meat	-0.3219	-5.70***
Health consideration	0.1012	0.36^{NS}
Advertisement	0.0808	0.31^{NS}
Religious Consideration	0.2023	0.57^{NS}

Table 50 Continued

Cultural consideration	0.8955	2.11**	
Average price of other meat on the market	0.0440	0.71^{NS}	
Taste of locally processed poultry meat	0.2855	0.87^{NS}	
Ease of cooking	0.1446	0.53^{NS}	
Availability	-0.0418	-0.15^{NS}	
Model Summary			
R^2	Adjusted R^2	F	p-value
0.67	0.61	7.30	0.00

*** = highly significant ($p < 0.01$), ** = significant ($p < 0.05$), NS = Not significant
Source: Field data, 2009

From Table 50, it can be seen that the price of locally processed poultry meat is one of the most important variables affecting the demand for locally processed poultry meat. The coefficient of this variable was -0.4402 ($p < 0.05$) showing that for every one unit increase in price (GH¢/Kg) there would be 0.4402 Kg decrease in the demand for locally processed poultry meat. Similar findings were recorded by Rasool (1991) and Zahid (1994).

Income is an important variable in the estimation of demand for locally processed poultry meat. In the estimated demand model, the coefficient of consumer's income was 0.0076 ($p < 0.01$) which reveals that for one unit increase in income (GH¢), there might be 0.0076 Kg increase in demand for locally processed poultry meat. This variable is highly significant in its effect on demand for locally processed poultry meat. This is consistent with economic

theory that higher income results in increased demand for poultry meat, Ghafoor et al. (2010) established. This means that poultry meat is a normal good.

The coefficient of proportion of consumer's income spent on locally processed poultry meat per month was -0.3219 and was highly significant ($p < 0.01$) in explaining the probability of willingness to pay for locally processed poultry meat. The negative (-) coefficient indicates that the larger the individual or household's budget share paid for locally processed poultry meat relative to one's income, the less the probability that the individual or consumer will be willing to pay for the locally processed poultry meat. This could be explained by the fact that consumer's income is distributed among many food needs, so if the cost of locally processed poultry meat increases then other food needs will not be achieved. This finding is in line with that of Juma et al (2007).

The coefficient (0.3201) of price of imported processed poultry meat, which is the closest substitute for locally processed poultry meat, had the expected sign (+) which means that an increase in the price of imported poultry meat would result in increased demand for locally processed poultry meat though this factor was statistically non-significant in the estimation of demand for locally processed poultry meat.

The average price of locally processed poultry meat relative to that of other meat on the market, according to Schroeder & Mark (2000), is a major demand determinant. This is because meat products compete with each other in terms of price. This illustrates one of the most basic economic concepts that relative prices of substitute goods (e.g., pork, beef and game) affect demand for

locally processed poultry meat. In this estimation of demand, the coefficient of average price of other meat on the market relative to the price of locally processed poultry meat was 0.0440 with the expected sign (+) which means that an increase in the average price of other meat by one unit might result in the increased demand of locally processed poultry meat by 0.0440 though this variable is not significant in its effect on the demand for locally processed poultry meat. This implies that the consumers in the study area did not consider the price of other meat as major factor in determining their demand for locally processed poultry meat. This is contrary to the finding of Schroeder & Mark (2000).

According to Mermelstein (2002) ,one of the factors affecting consumer's food choices is taste, but in the estimation of demand for locally processed poultry meat in this study, the coefficient for taste is 0.02855 with the expected sign (+) which means that taste consideration in the choice of locally processed poultry meat positively affects the consumer's choice for locally processed poultry meat, it is not significant in this study which is contrary to the findings of researchers such as Mermelstein (2002); Stillings (1994) that taste has a strong influence on the choice of meat. This implies that with respect to this study, the consumers did not see taste as a major factor in their demand for locally processed poultry meat.

In estimating the demand for locally processed poultry meat in the study area, cultural consideration in the consumers' choice for locally processed poultry meat was significant ($p < 0.05$). This means that cultural consideration

was a major factor in determining the consumers demand for locally processed poultry meat. The sign for the coefficient (0.8955) was positive which means that in terms of cultural consideration, locally processed poultry meat was positively affected by cultural considerations. This could be the result of poultry meat not being regulated by ethno-religious beliefs and this finding was in line with that of Dindyal & Dindyal (2004) that culture has large impact on the choice of meat.

The value of adjusted R^2 in the demand estimation was 0.614 which meant that the independent variables included in the model explained 61% variation in the dependent variables. The p-value (0.00) in the estimation was significant, showing correct specification of the model.

Social and Demographic Characteristics of Poultry Meat Sellers

The sex of poultry meat sellers interviewed was skewed towards females which made up 54(75.0%) and 18(25.0%) respondents were males. As Table 51 depicts, the selling of poultry meat is largely a female business.

On the age distribution of poultry meat sellers interviewed, 20 (27.8%) were within the age range of 20 -30 years, 20 (27.8%) were in the age bracket between 31 – 40 years, 24(33.3%) falling in the age group 41 – 50 years which also constituted the modal age group of poultry meat sellers interviewed, 7(9.7%) of sellers were within the age group of 51 – 60 years and 1(1.4%) being in the age group 61 – 70 years. The ages of the sellers were fairly distributed

and the majority of them were within the active force age group bracket as depicted by Table 51.

Table 51: Sex and Age Distributions of Poultry Meat Sellers

Sex Distribution			Age Distribution		
Sex	Frequency	Percent	Age range(Years)	Frequency	Percent
Male	54	75	20-30	20	27.8
Female	18	25	31-40	20	27.8
			41 -50	24	33.3
			51- 60	7	9.7
			61 - 70	1	1.4
Total	72.0	100.0	Total	72	100.0

Source: Field data, 2009

Educational Level Distribution of Poultry Meat Sellers

The educational levels of the poultry meat sellers were fairly distributed across all levels of education including people who had no formal education at all but a slight majority of them being educated up to the Middle School or Junior Secondary School level. This could be attributed to the situation where the poultry meat selling business does not require special technical skills and one basically has to know how to read and write to be in this business.10(13.9%) of the respondents had no formal education at all, 25(34.7%) being educated up to the Middle or Junior Secondary school level,21(29.2%) of the sellers educated up to the Senior Secondary school, Ordinary Level or Advanced Level, 12(16.7%) went through Vocational or

Technical education and 4(5.6%) were educated up to the tertiary level as presented in Table 52.

Table 52: Educational Level Distribution of Poultry Meat Sellers

Educational level	Frequency	Percent
No formal education	10	13.9
MSLC/JSS	25	34.7
SHS/O'level/A'level	21	29.2
Vocational/Technical	12	16.7
Tertiary	4	5.6
Total	72	100.0

Source: Field data, 2009

Categorization of Poultry Meat Sellers

In the categorization of the poultry meat sellers, 11 (15.3%) were in the 'wholesaler' category, 52(72.2%) were in the 'retailer' category, 2 (2.8%) were in the 'hotelier' category, 3 (4.2%) were in the 'chop bar operator' category and 4(5.6%) were in the 'fast food joint operator' category. Basically, the poultry meat trade was skewed towards retailers because the 'chop bar operators', fast food joint operators and hoteliers are all retailers of the poultry meat and these categories put together constituted 84.7% of sellers of poultry meat interviewed. This is presented in Table 53.

Table 53: Categorization of Poultry Meat Sellers

Category	Frequency	Percent
Wholesaler	11	15.3
Retailer	52	72.2
Hotelier	2	2.8
Chop bar operator	3	4.2
Fast food joint operator	4	5.6
Total	72	100.0

Source: Field data, 2009.

Comparison of Unit Price of Poultry Meat Price to that of other Meat

In comparing prices of poultry meat and that of other meat to know which one was cheaper, the majority, 86.1%, of the poultry meat sellers agreed that relatively, poultry meat was cheaper in price.

Consumers' Preference for Poultry Meat

Inquiring from poultry meat sellers to know the type of meat consumers prefer to buy the most, 66(90.7%) of the sellers cited poultry meat as the meat that consumers bought the most. However, 6(8.3%) of the seller respondents cited the other meats they sell as the one consumers bought the most. As depicted in Table 54, the majority of consumers' preference is skewed towards poultry meat according to the poultry meat sellers.

Table 54: The Type of Meat that Enjoys Most of Consumers' Preference

Consumers' preference	Frequency	Percent
Poultry meat	66	90.7
Other meats	6	8.3
Total	72	100.0

Source: Field data, 2009

Origin and Parts of Layer Poultry Meat Sold

On the parts of poultry meat and the origin (local/imported) of poultry meat that sellers sold, 1(1.4%) of the respondents sold 'full chicken' locally processed layer whereas the majority of respondents, representing 71(98.6%) did not sell 'full chicken' of locally processed layer. However, 44(61.1%) sellers sold 'full chicken' of imported processed layer and 28(38.9%) of sellers not selling 'full chicken' imported processed layer as presented in Table 55.

Table 55: Sale of 'Full Chicken' of Locally/Imported Processed Layer Meat

'Full chicken' locally processed layer			'Full chicken' imported processed layer		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	1	1.4	Sell	44	61.1
Not sell	71	98.6	Not sell	28	38.9
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

In Table 56, it can be seen that out of the 72 sellers interviewed, 1(1.4%) of the sellers interviewed affirmed that he/she sold "wings' of locally processed

layer, 71(98.6%) respondents did not sell 'wings' of locally processed layer. On the other hand, 69(95.8%) of sellers sold 'wings 'of imported processed layer whereas 3(4.2%) of sellers did not sell wings of imported processed layer.

Table 56: Sale of 'Wings' of Locally/Imported Processed Layer

'Wings' of locally processed layer			'Wings' of imported processed layer		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	1	1.4	Sell	69	95.8
Not sell	71	98.6	Not sell	3	4.2
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

Out of the 72 sellers of poultry meat sellers interviewed, 1(1.4%) of the respondents sold 'drumsticks' of locally processed layer and 71(98.6%) of the respondents did not sell 'drumsticks' of locally processed layer. However, 51(70.8%) of the respondents sold drumsticks of imported processed layer whereas 21(29.2%) did not sell 'drumsticks 'of imported processed layer as presented in Table 57.

Table 57: Sale of 'Drumsticks' of Locally/Imported Processed Layer

'Drumsticks' of locally processed layer			'Drumsticks' of imported processed layer		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	1	1.4	Sell	51	70.8
Not sell	71	98.6	Not sell	21	29.2
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

Out of 72 processed poultry meat sellers interviewed, 1(1.4%) of them sold gizzard' of locally processed layer and 71(98.6%) did not sell 'gizzard' of locally processed layer. On the contrary, 57(79.2%) of respondents sell gizzard' of imported processed layer and 15(20.8%) of the sellers did not sell 'gizzard' of imported processed layer as Table 58 depicts.

Table 58: Sale of 'Gizzard' of Locally/Imported Processed Layer

'Gizzard' of locally processed layer			'Gizzard' of imported processed layer		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	1	1.4	Sell	57	79.2
Not sell	71	98.6	Not sell	15	20.8
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

All the 72(100%) poultry meat sellers interviewed could not tell the other parts of processed poultry layer they sold, be it that of local or exotic origin.

Origin and Parts of Broiler Poultry Meat Sold

On the sale of broiler parts from the local or foreign origin, 69(95.8%) of the respondents did not sell 'full chicken' locally processed broiler but 3(4.2%) of the respondents sell 'full chicken' locally processed broiler. However, 40(55.6%) of the respondents sold 'full chicken' imported processed broiler and 32(44.4%) not selling 'full chicken' imported processed broiler as depicted by Table 59.

Table 59: Sale of 'Full Chicken' of Locally/Imported Processed Broiler

'Full chicken' locally processed broiler			'Full chicken' imported processed broiler		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	3	4.2	Sell	40	55.6
Not sell	69	95.8	Not sell	32	44.4
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

From Table 60, few sellers, 3(4.2%), sold 'wings' of locally processed broiler and 69(95.8%) not selling 'wings' of locally processed broiler. On the other hand, 64(88.9%) of the respondents sold 'wings' of imported processed broiler but 8(11.1%) of the sellers not selling 'wings' of imported processed broiler.

Table 60: Sale of 'Wings' of Locally/Imported Processed Broiler

'Wings' of locally processed broiler			'Wings' of imported processed broiler		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	3	4.2	Sell	64	88.9
Not sell	69	95.8	Not sell	8	11.1
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

Out of the 72 sellers interviewed, 70(97.2%) of them did not sell 'drumsticks' of locally processed broiler but 2(2.8%) sold 'drumsticks' of locally processed broiler. However, 46(63.9%) of respondents sold 'drumsticks' of imported processed broiler and 26(36.1%) not selling 'drumsticks' of imported processed broiler as presented in Table 61.

Table 61: Sale of 'Drumsticks' of Locally/Imported Processed Broiler

'Drumsticks' of locally processed broiler			'Drumsticks' of imported processed broiler		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	2	2.8	Sell	46	63.9
Not sell	70	97.2	Not sell	26	36.1
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

Only 1(1.4%) of the sellers interviewed sold 'gizzards' of locally processed broiler but 71(98.6%) of them did not sell 'gizzards' of locally processed broiler. Contrary, 56(77.8%) of respondents sold 'gizzards' of imported processed broiler and 16(22.2%) of respondents not selling 'gizzards' of imported processed broiler as depicted by Table 62.

Table 62: Sale of 'Gizzard' of Locally/Imported Processed Broiler

'Gizzards' of locally processed broiler			'Gizzards' of imported processed broiler		
Sell/Not sell	Frequency	Percent	Sell/Not sell	Frequency	Percent
Sell	1	1.4	Sell	56	77.8
Not sell	71	98.6	Not sell	16	22.2
Total	72	100.0	Total	72	100.0

Source: Field data, 2009

Comparison of the Patronage of Locally Produced and Imported Poultry Meat

The majority, 88.9%, of the sellers interviewed said that the imported processed poultry meat enjoyed a higher patronage from consumers than the locally processed poultry meat and therefore the imported processed poultry meat selling faster than the locally processed poultry meat. The sellers attributed this to the affordability of the imported poultry meat in terms of prices, its processed and packaged nature, its availability and the scarcity of the locally processed poultry meat. On the contrary, 8(11.1%) of the sellers countered by saying that locally processed poultry meat sold faster than imported processed poultry meat. The reasons cited were the relative better taste of the locally processed poultry meat and the perceived wholesomeness of it as presented in Table 63.

Table 63: Sellers' Perception on the Origin of the Processed Poultry Meat that Enjoys Higher Patronage

Origin of processed poultry meat enjoying higher patronage	Frequency	Percent
Imported processed poultry meat	64	88.9
Locally processed poultry meat	8	11.1
Total	72	100.0

Source: Field data, 2009.

Assessment of Current Patronage of Poultry Meat and about Ten Years Ago

On comparing the current patronage of poultry meat to the situation some years back (10 years back), 15(20.8%) of the sellers affirmed that there had been a dramatic increase in the current patronage of poultry meat compared to the level of patronage some years ago, 23(31.9%) of the sellers also agreed that there had been an increase in the current patronage of poultry meat compared to the situation some years ago though the increase was marginal. To sum up, the majority, 38(52.7%), of the sellers at least affirmed that, currently (at the time of data collection), there had been an increase in the patronage of processed poultry meat compared to the situation that pertained some years back. However, 9(12.5%) of the sellers stated that the patronage of poultry

meat had not changed compared to what pertained some years back. Furthermore, 19(26.4%) of the sellers disagreed with the stance taken by the other sellers and said that there had been a marginal decrease in the current patronage of poultry meat compared to the situation some years back. Apart from these, 6(8.3%) of the sellers stated that the current patronage of poultry meat had not just declined but declined dramatically. In all, 25(34.7%) of the sellers at least said that there had been a decrease in the current patronage of poultry meat compared to the situation some years back as depicted on Table 64.

Table 64: Sellers' Assessment of the Current Patronage of Poultry Meat and Some Years Back

Sellers' assessment	Frequency	Percent
Dramatic increase	15	20.8
Marginal increase	23	31.9
Remained the same	9	12.5
Marginal decrease	19	26.4
Dramatic decrease	6	8.3
Total	72	100.0

Source: Field data, 2009

Comparison of Prices of Locally Processed and that of Imported Poultry Meat

Comparing the prices of one pound of locally processed poultry meat to that of imported processed poultry meat, the prices of one pound of locally processed poultry meat ranged between GH¢4 - GH¢ 5 whereas that of the imported processed poultry meat ranged between GH¢ 2.5 - GH¢ 4. By this, it is obvious that on the market, comparatively, the price of one pound of locally

processed poultry meat was more expensive than that of imported processed poultry meat. As every consumer is assumed to be a rational being, most consumers would patronize the imported processed poultry meat because of cheaper prices irrespective of other advantages that the locally processed poultry meat may have over the imported ones, hence, the high patronage that the imported processed poultry meat enjoyed. The majority of the poultry meat sellers, 93.1%, asserted that consumers preferred poultry meat to other meats that they sold.

Comparison of the Cheapness of Locally Processed Poultry and Imported Poultry Meat

The majority of the sellers, 65(90.3%), saw the price of poultry meat to be cheaper than that of other meats on the market whereas 7(9.7%) of the sellers interviewed saw the prices of other meats being cheaper than that of poultry meat as depicted by Table 65.

Table 65: Sellers Perception of the Relative Cheapness of Poultry Prices Compared to that of other Meats

Sellers perception on relative cheapness of prices	Frequency	Percent
Poultry meat prices are cheaper	65	90.3
Other meat prices are cheaper	7	9.7
Total	72	100.0

Source: Field data, 2009

Factors that Sellers Considered to Affect the Quantity of Poultry Meat Consumed

The majority of the sellers interviewed, 81.9%, were of the opinion that the availability of the poultry meat compared to other meats (substitutes) had effect on the quantity of poultry meat consumption. Again, 87.5% were of the opinion that the taste of poultry meat had effect on the consumption of poultry meat.

Sellers' Opinion on the Imposition of Tariffs on Imported Poultry Meat

The majority, 55.6% , of the sellers were against the imposition of heavy tariffs on imported processed poultry meat citing reasons that imposition of tariffs would reduce imports whereas locally produced poultry meat could not meet market demand and thereby resulted in increased prices of poultry meat in the country and would negatively affect their businesses but 44.4% were in favour of the imposition of heavy tariffs on imported processed poultry meat and the reasons being that it would increase local poultry production and boost patronage of locally processed poultry meat.

Identification of Factors Affecting Demand for Locally Processed Poultry Meat by Sellers

The sellers of poultry meat interviewed for this study were asked to identify factors that influenced the sale of locally processed poultry meat. Table 66 presents the factors identified by sellers and the corresponding number of sellers.

Table 66: Factors Identified by Poultry Meat Sellers as Affecting Demand for Poultry Meat

Factors Identified	Number of Sellers	Percentage
1. Taste of poultry meat	72	100
2. Low fat content of poultry meat	60	83.3
3. The relative cheaper prices of poultry meat	70	97.2
4. Its easiness to cook	40	55.5
5. Perceived increased income of consumers	65	90.3
6. Urbanization	30	41.6
7. The availability of poultry meat in 'spare parts' to satisfy all kinds of consumers	72	100

n = 72
Source: Field data, 2009.

Ranking of Factors Affecting Demand for Locally Processed Poultry Meat by Poultry Meat Sellers

The poultry meat sellers were asked to rank the factors affecting consumers' demand for locally processed poultry meat identified in order of severity on a scale of 7 to 1 with 7 being the most severe and 1 being not severe. The rankings by the poultry meat sellers are presented in appendix F. The total rankings and the positions assigned to the factors are presented in Table 67.

Table 67: Rank Totals of Factors Identified by Poultry Meat Sellers

Demand Factors	Rank Totals	Position
1.The relative cheaper prices of poultry meat	469	1st
2.The availability of poultry meat in 'spare parts' to satisfy all kinds of consumers	402	2nd
3. Perceived increased income of consumers	365	3rd
4.Taste of poultry meat	311	4th
5.Urbanization	169	5th
6.Low fat content of poultry meat	160	6th
7.Its easiness to cook	144	7th

Source: Field data, 2009

Degree of Agreement of Rankings by Poultry Meat Sellers

The degree of agreement of rankings by poultry meat sellers is computed by using the Kendall's Coefficient of Concordance, W. It is expressed as, $= \frac{S}{\frac{1}{12}k^2(n^3-n)}$; and $S = \sum(SR)^2 - n\left(S\tilde{R}\right)^2$

From Table 67, S = $(469)^2 + (402)^2 + (365)^2 + (311)^2 + (169)^2 + (160)^2 + (144)^2$ - $7(288.6)^2$ = 77673.28. Hence, $W = \frac{103378.20}{\frac{1}{12}*5184(343-7)}$

W = 0.71. This implies that W is 71.0% and hence indicates an agreement by poultry meat sellers as to the order of severity of the factors affecting consumers' demand for locally processed poultry meat.

Test of Hypothesis

H_0: W = 0 (there is no agreement as to the order of severity of rankings by sellers)

H_1: W = 0 < W≤ 1 (sellers are in a fair agreement as to the order of rankings of severity)

Here, the worked out value of ***s*** is 103378.20 which is greater than those shown in the table values in appendix H for 1 percent level of significance, then we reject the null hypothesis.

Preliminary Conclusions

As the worked out value of ***s*** is 103378.20 which is greater than those shown in the table values in appendix H for 1 percent level of significance, we

reject the null hypothesis of no agreement in the order of rankings. Therefore poultry meat sellers are in a significant level of agreement as to the order of ranks hence poultry meat sellers in the study area perceive the factors similarly in terms of severity and their influence on poultry meat consumption.

The Way Forward Suggested by Sellers

On the way forward to ensure increased production of locally processed poultry meat, sellers suggested improvement in production technology; reduction in cost of production by increasing scale of production, producers should acquire more processing know-how, ensure proper packaging and acquire credit to expand businesses.

Sellers interviewed also suggested that consumers of poultry meat should consume more of locally processed poultry meat, have positive perception about locally processed poultry meat.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter is the concluding chapter of the thesis report. It summarises the report, and presents the conclusions on the findings found from the analysis and discussions. The chapter also presents policy recommendations that might help to improve the poultry industry in the country.

Summary

Poultry meat is the most popular source of non-vegetarian protein in Ghana as a result of lower price, perceived safety and health advantages compared to other meat sources. Though Ghana's demand for poultry products has increased tremendously over the years, the local poultry industry has not been well positioned to meet the rising demand for poultry products in the country. Traders go to poultry farms to purchase birds in bulk for further retailing. They usually sell these birds live on the open market. Some producers also sell live birds at the farm-gate (Aning, 2006).

According to GOG sources, broiler production has experienced a steep decline from 80 percent of the market supply in 2000 to 10 percent in 2010. Consumption patterns of households in urban areas in Ghana are heavily weighted towards imported frozen poultry products. The reasons for this trend

are that it is cheaper than locally produced poultry and it is already pre-cut, such as leg quarters and wings, and processed whole chicken and gizzards. As such, the convenience of a ready-to-use chicken product has boosted consumer demand for imported poultry meat. In Ghana local processing of poultry into cut portions to facilitate quick and easy use by consumers is limited (GAIN Report, 2011).

In order to stay competitive, the poultry industry must process more of its products to satisfy emerging consumer demands. To achieve this, the constraints militating against the production, distribution and consumption of locally processed poultry meat need to be identified so that possible practical measures could be put in place to address these constraints to boost the local poultry industry in the country.

Thus, the main objective of this study was to identify and rank in order of severity the major constraints militating against the production, distribution and consumption of locally processed poultry meat in the Greater Accra region of Ghana.

Technical publications that will come out of this study will be made available to the poultry industry policy makers, MOFA, universities and other institutions promoting value-added agriculture to inform decisions that seek to improve the poultry industry in Ghana. There was a review of related literature.

The Greater Accra region was the study area. The Greater Accra Region is the smallest of the ten administrative regions in Ghana in terms of area. The political administration of the region is through the local government system.

The research employed descriptive survey design. The population for this study was all poultry farmers who belonged to known or recognized poultry farmers' associations, consumers of poultry meat and sellers of poultry meat in the Greater Accra region. Poultry farmers, sellers and consumers are spread out in the whole Greater Accra region and therefore a sample of the population of poultry farmers, sellers and consumers were taken from the Greater Accra region. The Greater Accra Poultry farmers Association (GAPFA) is made up of about 200 members, Tema Metropolitan Poultry Farmers Association (TEMPFA) making up of about 50 active members and Oyarifa Livestock Farmers Association (OLFA) comprising of about 45 active members. This study employed combination of purposive and random sampling techniques. The study area, Greater Accra, was selected purposively.

The study relied basically on the primary data gathered from respondents in the study area through the use of structured interview schedule. The target population for this study was commercial poultry farmers who belonged to an association within the study area, consumers of poultry meat and sellers of poultry meat in the study area. The results for the study were obtained (from the data collected from the field with the help of SPSS computer software) using largely quantitative statistics and descriptive statistics including frequencies, percentages, mean, standard deviation, Kendall's Coefficient of Concordance, Friedman's chi-square test statistics and OLS regression.

Key Findings

The study results revealed the following findings:

a) In decreasing order of severity of constraints identified by the poultry farmers, the order was: High average cost of inputs, low tariffs on imported poultry meat, high borrowing rates of interest, relative cheaper price of imported poultry meat, relative higher prices of locally processed poultry meat, the unavailability or difficulty in accessing credit, lack of processing know-how, disease outbreak, lack of technical support, distance from the consuming market.

b) In estimating the supply of locally produced processed poultry meat, the constraints: disease outbreaks, relative high price of locally processed poultry meat and high average cost of inputs were found to be significant at probability levels of $p < 0.01$, $p < 0.05$ and $p < 0.1$ respectively.

c) On the order of severity of the factors affecting the consumption for locally processed poultry meat, the consumers ranked the factors in decreasing order of severity as: relative higher prices of locally processed poultry meat , relative cheaper prices of imported processed poultry meat , perceived increased income of consumers , relative higher prices of other meat on the market , proportion of consumer's income spent on poultry meat , the perceived better taste

of locally processed poultry meat , health considerations , easiness of cooking , religious considerations , cultural consideration , advertisement.

d) The factors that were significant on the demand for locally processed poultry meat are price of locally processed poultry meat, income of consumer, proportion of consumer's income spent on poultry meat and cultural consideration at probability levels of $p < 0.01$, $p < 0.05$, $p < 0.05$ and $p < 0.01$ respectively.

e) In ranking the factors affecting the sale of locally processed poultry meat in terms of severity, sellers ranked them in decreasing order of severity as: the relative cheaper prices of poultry meat, the availability of poultry meat in 'spare parts' to satisfy all kinds of consumers, perceived increased income of consumers, taste of poultry meat, urbanization, lower fat content of poultry meat, easiness to cook poultry meat.

f) There was an agreement amongst poultry farmers, poultry meat consumers and poultry meat sellers with the order of severity of the factors affecting production, distribution and consumption of locally processed poultry meat.

Conclusions

Depending on the results obtained from the survey data as presented and discussed in chapter four, the following conclusions were drawn from the study:

1. The factors: disease outbreaks, relative high price of locally processed poultry meat and high average cost of inputs have significant effect on the supply of locally processed poultry meat.
2. The top three factors that constrain the production of locally processed poultry meat in the Greater Accra Region, in descending order of severity, were: high average cost of inputs, low tariffs on imported poultry meat and high borrowing rates of interest.
3. The factors: price of locally processed poultry meat, income of consumers, proportion of consumer's income spent on poultry meat and cultural consideration have significant effect on the demand for locally processed poultry meat.
4. The top three main factors that constrain the consumption of locally processed poultry meat in the Greater Accra Region, in decreasing order of severity are: relative higher prices of locally processed poultry meat, relative cheaper prices of imported processed poultry meat and higher proportion of consumer's income spent on locally processed poultry meat.
5. The top two main factors affecting the distribution of locally processed poultry meat in the Greater Accra Region in terms of severity in

decreasing order are: the relative higher prices of locally processed poultry meat, the unavailability of locally processed poultry meat in 'spare parts' to satisfy all kinds of consumers and the scarcity associated with locally processed poultry meat on the market.

6. Poultry farmers, poultry meat consumers and poultry meat sellers agree to the order of the severity of the constraints to production, distribution and consumption of locally processed poultry meat.

Recommendations

The study makes the following recommendations based on the findings and conclusions drawn:

a) Producers should adopt more efficient method of production by acquiring state of the art technology to reduce cost of production.

b) The Ministry of Finance in collaboration with the Ministry of Trade and Industry need to consider waiving off or reducing drastically taxes on imported inputs for the poultry industry.

c) The Ministry of Finance, Agricultural Development Bank, Rural Banks and NGOs need to extend more loan/ credits facilities to poultry farmers at very minimal interest rates.

d) The Ministry of Food and Agriculture with Ministry of Finance should consider assisting poultry farmer associations which possess poultry feed mill to go into large scale cereal production so that feed cost will come down.

e) MOTI, MOFA, NCCE and NGOs should educate consumers on the positives of buying locally processed poultry meat and also provide consumers and sellers with a database of farms from which to source their locally processed poultry meat.

f) The Ministry of Trade and Industry should consider imposition of heavy tariffs on imported processed poultry meat.

g) Distributors of locally processed poultry meat should assist producers to improve upon their products by reporting the problems they encounter with products quality and complaints from consumers to the producers.

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APPENDICES

Appendix A

Structured Interview Schedule Questions for Poultry Farmers

Section I: Social and Demographic Information

1. Name of village / community/Town /city……..
2. Name of Metro /Sub-Metro/District……
3. Age of respondent : 20-30 [ ] 31-40 [ ] 41-50 [ ]

   51-60 [ ] 61-70 [ ] 71 and above [ ]
4. Sex: Male [ ] Female [ ]
5. Educational Level :

   No Formal Education [ ]

   MSLC / J S S[ ]

   Secondary School [ ]

   Training College [ ]

   Tertiary Level [ ]
6. Is poultry farming your main professional career? Yes [ ] No [

   ]

   Specify…….....
7. Do you undertake any other income-generating activities? Yes [ ]

   No [ ]

   Specify……...

Section II: Profile of Poultry Farm Business

8. Type of poultry birds kept: Chicken [ ] Number…… Turkey [ ] Numbers……. Ducks [ ] Number…… Guinea Fowls [ ] Number……..
9. Type of poultry farm : Small-scale (50 - 5,000 birds)[ ] medium-scale (5,000-10,000 birds) [ ] Large-scale (over 10,000 birds)[ ]
10. Which type of poultry enterprise are you into? Broiler enterprise [ ] Layer enterprise [ ] Both layer and broiler enterprises [ ]
11. For how long have you been in the poultry business? 1-5yrs [ ] 6-10yrs. [ ] 11-15yrs [ ] 16-20yrs [ ] 21yrs and over [ ]
12. How do you compare the profitability of the current poultry industry to that of some years back ? It used to be more profitable in some years back than now [ ] It is now more profitable than it used to be some years back [ ] Has not changed[
13. Give reason(s) for your answer in question (12)

……

Section III: Supply and Processing Capacity

14. Do you process the poultry meat or sell live birds?

Process the poultry meat [ ]

Sell live birds [ ]

Process and also sell live birds [ ]

15. If you answered that you do not process at all but sell live birds in question (14) , then can you give some reasons why you do not process?

……

16. What are your average daily sales?

…….

17. What are your average monthly sales?

…….

18. What is your average daily supply of poultry meat in pounds?

…….

19. What is your average monthly supply of poultry meat in pounds?.....

20. What is your estimated monthly demand for poultry meat?

……

21. On the average, how much is the price of one pound of locally processed poultry meat on the market? ……

22. What is the average price of one pound of imported processed poultry meat on the

market?.....

23. What is the average demand for poultry meat during peak times?

…….

24. At what average price do you sell a pound during peak times?

……..

25. What is the average demand for poultry meat during lean season?

.....

26. At what average price do you sell a pound during lean season?

.....

27. What is the average weight of your birds at maturity?

Broilers ……. Layers ……..

28. If processed how much do you sell an average bird?

Broiler……. Layer……..

29. Comparing the prices for locally processed poultry meat and that of imported processed poultry meat on the market which one is cheaper? Imported processed poultry meat [ ] Locally processed poultry meat [ ]

30. Give reasons for your answer in question 29.

……

Section IV: Factors Affecting Production of Locally Processed poultry meat

31. What is your average monthly cost of inputs (labor, feed, medicines, and energy)?

Inputs	**Unit price(GH¢)**	**Quantity**	**Total Price(GH¢)**
Labour			
Feed			

Medicine			
Energy			

32. Which specific input impacts heavily on the pricing of your poultry meat?……

33. How do you finance your business? Loan facility from the bank or government[ ] out of personal or family funds [ ]

34. How much interest (rate) do you pay on your loan from the banks? ……

35. Are you satisfied with that rate? Yes [ ] No [ ]

36. If 'No' in (35), then what do you suggest to be the ideal interest rate?

37. What is the impact of credit on your poultry production? Positive[ ] Negative [ ]

38. Are credit facilities available for local poultry production? Yes [ ] No [ ]

39. Does this situation influence your production level? Yes [ ]No [ ]

40. How? ……

41. How does the imposition of tariffs on imported poultry products impact on local poultry meat production? Positively [ ] Negatively [ ]

42. Give reasons for your answer in question 41

……

43. Are you happy with the current 20% of tariffs on imported processed poultry meat? Yes [ ] No [ ]

44. If 'No' to 43, then what should the percentage of tariff be?

……

45. Do you have any training in poultry meat processing know –how?

Yes [ ] No [ ]

46. How did you acquire these skills if "Yes" to question 45 above?

……

47. Does this affect your production level for the year? Yes [ ] No [ ]

48. What is the distance in kilometers from your poultry farm or point of production to the nearest market? ……..

49. Are you able to transport your goods easily? Yes [ ]

No [ ]

50. What is the most common mode of transport? …….

51. What is the average cost you incur in transporting your goods to the market?.....

52. Does this level of transport cost affect your production level? Yes [ ] No [ ]

53. If you answered 'Yes' to question 52, then could you explain?

……

54. Do you experience any poultry disease outbreaks within the year?

Yes [ ] No [ ]

55. If 'Yes' in question (54), then how does it affect the level of output in the year? Negative [ ] Positive [ ]

56. Kindly Give reason(s) for your answer in question 54

……

57. Do you get any technical support from the Ministry of Agriculture, from any association or from an NGO in production, processing, marketing? Yes [ ] No [ ]

58. If 'Yes' in (57), then how does it affect your output? Positive [ ] Negative [ ]

59. Do you have any processing equipment? Yes [ ] No [ ]

60. Since when have you been involved in processing? Specify in yrs ……. Not at all [ ]

61. Please indicate by ticking where appropriate, the factors that affect your ability to produce locally processed poultry meat

i.Price of locally processed poultry meat ( )

ii. Price of imported processed poultry meat ( )

iii. Average cost of inputs ( )

iii. Government policy in terms of tariffs on imported poultry meat ( )

iv. Borrowing rate of interest to agriculture ( )

v.Processing know-how ( )

vii.Availability of credit to poultry farmers ( )

viii.Distance from the consuming market ( )

ix. Technical support ( )

x.Disease outbreaks ( )

62. Others(please, list if any)

……

63. From the factors you indicated above rank them in order of severity in affecting your ability to produce locally processed poultry meat with 10-being the most severe to 1-being not severe

10……

9……

8……

7……

6……

5……

4……

3……

2……

1……

63. In your own opinion what do you think can be done by consumers to boost the production of locally processed poultry meat on the market ? ……..

64. Also, what do you think that you producers should also do to ensure that we get locally processed poultry meat on the market?

……

……

65. Lastly, what should the government do to boost local production of processed poultry meat and the poultry industry in general?

……

……

Thank you very much for your assistance

Appendix B

Structured Interview Schedule Questions for Poultry Meat Consumers

SECTION I: Social and Demographic Data

1. Name of Village /Town /City: ……..
2. Name of District/ Metropolitan /Sub-

   Metro/Municipality……
3. Age of Respondent: ……..
4. Sex : Male [ ] Female [ ]
5. Educational Level :

No Formal Education [ ]

MSLC/ J S S[ ]

S SS [ ]

Training College [ ]

Tertiary [ ]

Others [ ] Specify

……

SECTION II: Consumer Profile and Preference .

6. What is your Profession?

Teacher [ ]

Agriculturist [ ]

Medical Doctor [ ]

Accountant [ ]

Banker [ ]

Lawyer [ ]

Journalist [ ]

Artisan [ ] Specify (mason, carpenter, plumber etc). …..

Other [ ] Specify ……..

7. Apart from your main profession, what do you do for a living?

Teaching [ ]

Banking [ ]

Trading [ ]

Farming [ ]

Construction [ ]

Driving [ ]

8. Marital status: Married[ ] Not married before [ ] Divorced [ ] Widow/widower [ ]
9. What is the size of your family in figures if married or having family?

   ……
10. How much of your monthly take-home pay or income is spent on the following for yourself and dependant(s) (if any)

Clothing ……

Cosmetics ……

Food (staples)……

Food (meat and fish) ……

Utilities (water and electricity) …….

Vegetables and others ……..

Others (miscellaneous)……

11. What proportion of your monthly income is saved? ……
12. On the average, what is the proportion of your average monthly income spent on poultry meat in a month? ……
13. What do you think is the average quantity (weight) of poultry meat you (and your family, if any) consume in a month ?

    …….
14. At what price is one pound of locally processed poultry meat sold for in the market? ……..
15. Are you able to afford to buy at that price? Yes [ ] No [ ]
16. If 'No' why?.....
17. If you answered 'Yes' to question 15, then do you think locally processed poultry meat is expensive at that price ? Yes [ ] No [ ]
18. At what price is one pound of imported processed poultry meat sold in the market? .....
19. Do you think that the level of your income influences your level of poultry meat consumption ? Yes [ ] No [ ]
20. If 'No' why? ……

21. Where were you staying about ten years ago? Urban area [ ], Rural area [ ]
22. Where are you staying currently? Urban area [ ] Rural area[ ].
23. How do you compare your current monthly income to that of about 10 years ago? Increased [ ] Decreased [ ] Not changed [ ]
24. Comparing your current level of poultry meat consumption to the level of consumption about ten (10) years ago , would you say there has been an increase or decrease in your level of consumption ? Increase [ ] Decrease [ ]Not changed [ ]
25. In what form do you normally get your poultry meat? In a processed form [ ] live bird before I process [ ]
26. From where do you obtain your poultry meat? Market [ ] from the poultry farm [ ] Backyard [ ]
27. Are you able to distinguish between locally processed poultry meat and imported processed poultry meat ? Yes [ ] No [ ]
28. Do you consume other meat apart from poultry meat? Yes [ ] No [ ]
29. If you answered 'yes' in (28), then which type of meat? Beef [ ] sheep and goat meat [ ] pork [ ] Bush meat [ ] Other [ ] Specify ……..
30. On the average , how much is one pound of the other meat you consume apart from poultry meat ? ……..

SECTION III: Factors Affecting Demand for Poultry Meat

31. Which of the following factors do you also consider in your choice of poultry meat?

Taste: Yes [ ] No [ ]

Health consideration: Yes [ ] No [ ]

Religious consideration: Yes[ ] No [ ]

Cultural consideration : Yes [ ] No [ ]

Easiness of cooking: Yes [ ] No [ ]

32. Do you think that advertisement affect your level of poultry meat consumption ? Yes [ ] No [ ]

33. If 'Yes' how does it affect your level of consumption? Positively [ ] Negatively [ ]

34. Do outbreaks of poultry diseases affect your level of poultry meat consumption? Yes [ ] No [ ]

35. How does a disease outbreak affect your level of poultry meat consumption? Positively [ ] Negatively [ ]

36. Locally processed poultry meat and imported poultry meat, which one do you prefer ? Imported processed poultry meat [ ] locally processed poultry meat [ ]

37. Which one do you end up buying? Locally processed poultry meat [ ] Imported processed poultry meat [ ]

38. Why?……

39. Which parts of poultry meat do you normally buy on the market?

Full Chicken (broiler or layer) [ ] Wings [ ] Thighs [ ] drumstick [ ] Gizzard [ ]

breast [ ] back [ ] Other [ ] Specify ……

40. Does the meat you normally buy satisfy your expectation? Yes [ ] No [ ]

41. If 'No' to (40), what do you expect to find on the market?

……

42. Is locally processed poultry meat available on the market? Yes [ ] No[ ]

Section IV: Identifying and Ranking in Terms Severity of Factors Affecting Demand for Locally Processed Poultry Meat

43. Please indicate by ticking where appropriate the factors you think influence your demand for locally processed poultry meat.

i. Taste ( )

ii. Health Considerations ( )

iii. Price of imported poultry meat ( )

iv. Price of other meat on the market apart from poultry meat ( )

v. Advertisement ( )

vi. Easiness of cooking ( )

vii. Religious considerations ( )

viii. Cultural considerations ( )

ix. Cultural considerations ( )

x. Income of consumer ( )

xi. Proportion of consumer's income spent on poultry meat ( )

xii. Price of locally processed poultry meat ( )

44. Others (if any, please list)

……

45. From the factors you indicated above rank them in order of severity in influencing your demand for locally processed poultry meat with 11-being the most severe to 1-being not severe

11……

10……

9……

8……

7……

6……

5……

4……..

3……

2……

1……

46. In your opinion, what do you think are the factors that hinder the supply of locally processed poultry meat by our local commercial poultry farmers?

……

……

Section V: Finding Opportunities for Improving upon the Supply of Locally Processed Poultry Meat

47. Would you welcome imposition of heavy tariff on imported processed poultry meat to boost the local poultry industry? Yes [ ] No [ ]

48. Reasons for answer in 47:

……

……

……

49. In your opinion, what can be done by local poultry meat producers to boost the supply of locally processed poultry meat on the market?

……

……

……

50. Also, what do you think can government do to help the local poultry farmers to go into poultry meat processing to meet local demand?

……

……

……

51. What can you, the consumer, also do to help local poultry farmers to process poultry meat locally?.....

……..

Thank you very much for your assistance

Appendix C

Structured Interview Schedule Questions for Poultry Meat Sellers

Section I: Social and Demographic Data

1. Name of village/town /city …….
2. Name of metro/sub-metro/municipality/district……
3. Sex of seller male [ ]female [ ]
4. Age of seller 20-30 [ ]31-40 [ ]41-50 [ ] 51-60[ ] 61-70 [ ]

   71 and above [ ]
5. What is your educational level? No formal education [ ] JHS/MSLC [ ] SHS/O level/A level [ ] Vocational/Technical [ ] Tertiary [ ]
6. Type of seller: wholesaler [ ] retailer [ ] hotelier [ ]

   'Chop bar' operator [ ] Fast food joint operator [ ]

Section II: Consumers' Preference for either Imported or Locally Processed Poultry Meat

7. Do you sell other meat apart form poultry meat Yes [ ] No[ ]
8. If 'No' in (7) why? .....
9. If 'Yes', what other meat do you sell? Specify …….
10. In terms of relative prices, which one is cheaper? Poultry meat [ ] or other meat [ ]

11. Which of them do consumers buy most or sells faster? Poultry meat [ ] other meat [ ]
12. What is your average daily sale? .....
13. How many cartons or pounds of meat on the average are you able to sell in a day? ……..
14. What forms of poultry meat do you sell (tick):

	Whole chicken	Wings	Drumsticks	Gizzard	Others
Layer(local)					
Broiler(local)					
Layer(imported)					
Broiler(imported)					

15. How many cartons or pounds of poultry meat on the average are you able to sell within a month? ……
16. Which type of processed poultry meat do you sell most? Imported processed Poultry meat [ ] locally processed poultry meat [ ]
17. Give reasons for your choice of poultry meat in question 15 that you sell

    .....

    ……
18. Supposing you are given equal quantities of locally processed poultry meat and imported processed poultry meat, which one do you think will

sell faster assuming that consumers have knowledge about their availability?

Locally processed poultry meat [ ]

Imported processed poultry meat [ ]

19. Give reasons for your answer in (18)

……

How do you compare the current patronage of poultry meat to that of some years back?

Has increased dramatically [ ] Has increased marginally [ ] Remained the same [ ] Decreased marginally [ ] Decreased dramatically [ ]

20. What is the price of one pound of imported processed poultry meat?

……

21. What is the price of one pound of locally processed poultry meat?

…….

22. What categories of consumers patronize the processed poultry meat? Supposing you have 10 buyers, how many will buy a particular type of poultry meat?

Type of meat	Consumers (approximation in %)			
	Chop bar operators	Schools	Individuals buying small quantities	Individuals buying large quantities
Imported processed				
Local processed				

23. In your opinion, comparing taste of locally processed poultry meat and imported processed poultry meat, which one has a better taste?

    Locally processed broiler [ ] Locally processed layer [ ]

    Imported processed broiler [ ] Imported processed layer [ ]

Section III: Factors Responsible for Consumers' Preference for Poultry Meat and Ranking in Terms of Severity

24. Do you think consumers prefer poultry meat to other meat? Yes[ ] No[ ]

25. If 'Yes' to question 24, what are your reasons? Is it :

    (i) The relative cheaper price of poultry meat compared to other meat. Yes [ ] No [ ]

    (ii) The low fat content of poultry meat compared to other meat. Yes [ ] No[ ]

    (iii) Its processed nature allows one to buy any quantity and parts one prefers. Yes [ ] No [ ]

    (iv) Its easiness to cook. Yes [ ] No [ ]

    (v) Increased income of consumers. Yes [ ] No [ ]

    (vi) Urbanization. Yes [ ] No [ ]

    (vii) As a result of the availability of the poultry meat compared to other meat. Yes [ ] No [ ]

    (viii) Taste of poultry meat Yes [ ] No [ ]

26. Which other factors do you think affect the demand for poultry meat?

……..

27. Would you welcome imposition of heavy tariffs on imported processed poultry meat? Yes [ ] No [ ]

28. Kindly give reasons for your answer in 27 :

……

Section IV: Factors Affecting the Supply of Locally Processed Poultry Meat and Opportunities to Improve Upon its Supply

29. Please indicate by ticking where appropriate the factors you think affect the demand for your products

    i.Taste of poultry meat( )

    ii. Low fat content of poultry meat ( )

    iii.The relative cheaper price of poultry meat( )

    iv.Its easiness to cook ( )

    v.Increased income of consumers ( )

    vi.Urbanization ( )

    vii.As a result of its availability in 'spare parts' to satisfy all kinds of consumers ( )

30. Others (please, list if any)

    ……

31. From the factors you indicated above rank them in order of severity in affecting the demand for your products from 7-being most severe to 1-being not severe

    7……

    6……

    5……

4……

3……

2……

1……

32. Aside the factors outlined above, what other factors do you think hinder the production of locally processed poultry meat by our local commercial poultry farmers, ranking from most important to the least important?

    .....

33. What do you think are some of the problems you face in your poultry meat selling business?

    …….

34. Are there any peculiar problems with selling locally processed poultry meat? Yes [ ] No [ ] Reasons for answer:

    ……

    ……

35. Do you think we should have more locally processed poultry meat on the market than imported processed poultry meat? Yes [ ] No [ ]

36. If 'No' to question 35, what do you think can be done by producers, consumers and government to ensure that we have more locally processed poultry meat on the market than imported processed poultry meat?

	What should be done
Producers	
Consumers	
Government	

Thank you very much

Appendix D: Ranking of Constraints to Production of Locally Processed Poultry Meat by Producers

SERIAL	PLP	PIM	ACI	GTP	BRA	P KH	A VC	DCM	T ST	DOK
1	1	3	4	5	6	10	2	7	8	9
2	9	4	6	7	8	10	3	5	2	1
3	2	4	6	5	8	10	7	1	4	3
4	8	9	10	7	5	2	6	1	2	3
5	6	7	10	2	9	8	5	1	3	4
6	10	8	9	6	7	2	5	4	1	3
7	7	6	4	1	8	9	10	2	3	5
8	10	8	9	7	4	5	6	2	1	3
9	7	6	10	9	8	4	5	2	1	3
10	6	7	9	10	5	1	8	2	3	4
11	8	2	10	7	9	5	6	1	3	4
12	2	7	10	8	6	9	4	1	2	5
13	9	8	7	10	6	5	2	1	4	3
14	2	9	8	10	5	6	7	2	1	3
15	6	10	8	9	5	1	4	2	3	7
16	3	4	5	6	10	7	8	7	1	2
17	6	7	9	8	5	10	4	3	2	1
18	6	7	9	10	8	5	4	3	1	2
19	3	4	9	7	10	6	8	5	1	2
20	8	10	9	7	5	6	4	3	2	1
21	6	7	8	10	4	1	5	3	2	9
22	9	6	10	8	7	3	6	1	2	4
23	5	4	7	9	8	10	6	1	3	2
24	8	2	5	1	10	9	7	3	4	5
25	5	6	9	8	4	10	7	1	2	3
26	7	9	10	8	2	4	6	1	3	5
27	9	8	10	7	6	4	5	2	1	3
28	8	9	10	7	6	2	5	1	3	4
29	9	8	10	7	6	3	5	1	2	4
30	7	6	10	8	9	2	6	4	1	3

31	8	7	10	9	6	5	4	1	2	3
32	7	6	10	5	8	1	4	2	9	3
33	9	10	8	7	6	4	5	2	1	3
34	6	8	7	5	9	4	10	3	1	2
35	3	4	9	8	10	2	7	1	5	6
36	10	7	2	4	5	1	8	3	9	6
Total	235	237	296	252	243	186	204	85	98	133

Mean of rank sum: 196.9

Sample size: 36

PLP ….. Price of locally processed poultry meat

PIM……Price of imported processed poultry meat

ACI…..Average cost of inputs

GTP…..Government's policy in terms of tariffs on imported poultry meat

BRA …..Borrowing rate of interest to agriculture

PKH…..Processing know-how

AVC…..Availability of credit to poultry farmers

DCM…..Distance from the consuming market

TST……Technical support

DOK……Disease outbreak

Appendix E: Ranking of Factors that Affect Consumers' Demand for Locally Processed Poultry Meat by Poultry Meat Consumers

SERIAL NUMBER	TAP	HEP	PPM	POM	ADT	EOC	REC	CUC	IOC	PCI	PLM
1	4	6	11	7	3	5	2	1	9	8	10
2	5	6	10	8	1	3	4	2	9	7	11
3	5	6	10	8	3	1	4	2	9	7	11
4	6	5	10	8	1	4	3	2	9	7	11
5	6	5	10	8	1	4	3	2	9	7	11
6	6	5	10	8	1	4	3	2	9	7	11
7	5	6	10	8	1	4	3	2	9	7	11
8	5	6	11	7	1	4	3	2	9	8	10
9	5	6	11	7	3	1	2	4	9	8	10
10	6	5	10	8	4	1	2	3	9	7	11
11	8	7	11	9	3	2	1	4	6	5	10
12	6	5	10	8	1	4	3	2	9	7	11
13	6	5	10	8	1	4	3	2	9	7	11
14	6	5	10	9	1	4	3	2	7	8	11
15	6	5	10	8	1	2	4	4	9	7	11
16	6	5	10	7	1	4	3	2	9	8	11
17	6	5	10	8	1	4	3	2	9	7	11
18	6	5	10	7	1	4	3	2	9	8	11
19	6	5	10	8	1	4	3	2	9	7	11
20	6	5	10	8	1	4	3	2	9	7	11
21	6	4	10	9	1	2	3	5	7	8	11
22	6	4	10	8	1	5	2	3	9	7	11
23	5	6	11	8	2	3	1	4	9	7	10
24	7	4	10	8	1	2	5	3	9	6	11
25	6	5	10	8	1	4	2	3	9	7	11
26	6	5	10	8	1	4	3	2	9	7	11
27	6	4	11	8	1	5	2	3	9	7	10

28	6	4	10	9	1	2	5	3	8	7	11
29	6	5	10	8	1	4	3	2	9	7	11
30	6	5	10	8	1	4	3	2	9	7	11
31	6	5	10	8	1	4	3	2	9	7	11
32	11	5	9	4	3	6	2	1	7	8	10
33	5	6	10	8	3	1	2	4	9	7	11
34	6	8	11	7	2	4	1	2	9	8	10
35	6	5	10	8	1	4	3	2	9	7	11
36	6	5	10	8	1	4	3	2	9	7	11
37	5	6	10	8	1	4	3	2	9	7	11
38	6	5	10	8	1	4	3	2	9	7	11
39	6	5	10	8	1	2	4	3	9	7	11
40	6	5	10	7	1	4	3	2	9	8	11
41	6	5	10	8	1	4	3	2	9	7	11
42	6	5	11	8	1	4	3	2	9	7	10
43	6	5	10	8	1	4	3	2	9	7	11
44	6	5	11	8	1	4	3	2	9	7	10
45	6	5	10	8	1	4	3	2	9	7	11
46	5	6	10	8	1	3	4	2	9	7	11
47	6	5	10	8	1	4	3	2	9	7	11
48	5	6	9	10	4	2	3	1	8	7	11
49	3	4	8	7	1	6	5	2	10	9	11
50	6	5	10	8	1	4	3	2	9	7	11
51	6	5	10	8	1	4	3	2	9	7	11
52	6	5	10	8	1	4	3	2	9	7	11
53	4	5	6	9	3	1	7	10	2	1	8
54	5	6	10	8	1	2	4	3	9	7	11
55	6	5	10	8	1	2	3	4	7	9	11
56	6	5	10	8	1	4	3	2	9	7	11
57	10	6	7	2	3	1	4	5	8	11	9
58	6	5	10	8	2	3	4	1	9	7	11
59	6	5	10	8	1	4	2	3	9	7	11
60	6	5	10	8	1	4	2	3	9	7	11

61	6	5	10	8	1	4	2	3	9	7	11
62	6	5	10	8	1	4	2	3	9	7	11
63	6	5	10	8	1	4	2	3	9	7	11
64	5	6	11	9	2	3	4	1	8	7	10
65	6	5	10	8	1	4	2	3	9	7	11
66	6	5	10	7	1	4	2	3	9	8	11
67	6	5	10	8	1	4	2	3	9	7	11
68	6	5	10	7	1	4	2	3	9	8	11
69	6	5	10	8	1	4	2	3	9	7	11
70	6	5	10	8	1	4	3	2	9	7	11
71	6	5	10	8	1	4	2	3	9	7	11
72	6	5	10	8	2	4	3	1	9	7	11
73	6	5	10	8	1	4	2	3	9	7	11
74	5	6	10	8	1	4	2	3	9	7	11
75	6	5	10	8	1	4	3	2	9	7	11
76	6	5	11	7	1	4	3	2	9	8	10
77	6	5	10	8	1	4	3	2	9	7	11
78	6	5	10	8	1	4	3	2	9	7	11
79	5	6	10	8	4	3	2	1	9	7	11
80	6	5	10	8	1	4	3	2	9	7	11
81	5	6	11	8	3	2	4	1	8	7	10
82	6	5	10	8	1	4	2	3	9	7	11
83	6	5	10	8	1	4	3	2	9	7	11
84	6	5	10	8	1	4	3	2	9	7	11
85	6	5	10	8	1	4	3	2	9	7	11
86	6	5	10	8	1	4	3	2	9	7	11
87	6	5	10	8	1	4	3	2	9	7	11
88	6	5	11	8	2	1	4	3	9	7	10
89	6	5	10	8	3	4	1	2	9	7	11
90	6	5	10	8	1	4	3	2	9	7	11
91	6	5	10	8	1	4	3	2	9	7	11
92	6	5	10	8	1	4	3	2	9	7	11
93	6	5	10	8	1	4	3	2	9	7	11

94	5	6	10	8	4	3	1	2	9	7	11
95	6	5	10	8	3	4	2	1	9	7	11
96	6	5	10	8	1	3	2	4	9	11	7
97	5	6	10	8	1	4	3	2	9	7	11
98	6	5	10	8	1	4	2	3	9	7	11
99	6	5	10	8	1	4	2	3	9	7	11
100	11	2	3	5	4	6	1	10	9	7	8
101	4	2	6	11	1	5	6	3	10	7	9
102	6	5	10	8	1	4	2	3	9	7	11
103	6	5	10	8	1	4	2	3	9	7	11
104	8	7	9	5	1	2	4	5	10	3	11
105	6	5	10	8	1	4	2	3	9	7	11
106	6	5	10	8	1	4	2	3	9	7	11
107	5	6	10	8	1	3	2	4	9	7	11
108	6	5	10	8	1	4	3	2	9	7	11
Total	640	555	1070	828	151	389	310	278	952	768	1160

Mean of rank sum: 645.5

Sample size: 108

TAP…..Taste of locally processed poultry meat

HEP….Health consideration

PPM …..Price of imported poultry meat

POM…..Price of other meat on the market apart from poultry meat

ADT….Advertisement

EOC…..Easiness of cooking

REC….Religious consideration

CUC….Cultural consideration

IOC…..Income of consumer

PCI…… Proportion of consumers' income spent on poultry meat

PLM ……Price of locally processed poultry meat

Appendix F: Ranking of Factors that Influence Demand for Poultry Meat by Poultry Meat Sellers

SERIAL NUMBER	TPM	LFP	RCP	IEC	ICC	URB	ASP
1	4	3	7	1	5	2	6
2	2	1	6	4	5	3	7
3	4	2	7	1	5	3	6
4	4	3	7	2	5	1	6
5	4	2	7	1	5	3	6
6	6	1	5	2	4	3	7
7	5	2	7	3	6	1	4
8	5	1	7	2	6	3	4
9	4	1	7	3	6	2	5
10	2	1	6	4	5	3	7
11	4	2	7	1	5	3	6
12	5	1	7	2	6	3	4
13	4	1	7	2	5	3	6
14	5	3	6	2	4	1	7
15	4	2	7	1	5	3	6
16	4	1	7	3	5	2	6
17	5	2	7	3	4	1	6
18	5	3	7	4	6	2	4
19	4	2	7	3	5	1	6
20	3	4	7	2	5	1	6
21	4	3	7	1	5	2	6
22	4	3	7	2	5	1	6
23	4	2	7	1	5	3	6
24	4	2	6	1	7	3	5
25	4	2	6	1	5	3	7
26	5	2	7	1	6	3	4
27	7	2	6	1	5	3	4

28	1	2	7	6	3	4	5
29	4	2	7	1	5	3	6
30	5	2	6	3	7	1	4
31	3	2	6	1	5	4	7
32	4	3	7	1	6	2	5
33	6	3	5	1	4	2	7
34	3	1	6	2	4	5	7
35	4	2	7	3	6	1	5
36	5	2	7	1	6	3	4
37	5	3	6	2	4	1	7
38	4	3	6	2	5	1	7
39	4	3	7	1	5	2	6
40	7	5	6	2	4	1	3
41	3	4	7	2	6	1	5
42	4	3	7	2	5	1	6
43	4	3	7	2	5	1	7
44	5	1	6	3	4	2	7
45	3	2	6	1	5	4	7
46	4	1	7	2	6	3	5
47	6	3	7	2	4	1	5
48	6	3	7	2	4	1	5
49	7	1	4	2	3	6	5
50	3	2	7	1	6	5	4
51	5	2	7	1	6	3	4
52	4	1	5	2	7	3	6
53	4	2	7	1	6	3	5
54	6	3	7	1	5	2	4
55	4	3	7	2	5	1	6
56	4	2	7	3	5	1	6
57	4	2	5	1	6	3	7
58	4	1	7	2	6	3	5
59	4	1	7	2	6	3	5
60	4	3	6	2	5	1	7

61	4	3	7	1	5	2	6
62	3	2	7	4	5	1	6
63	5	1	6	4	3	2	7
64	6	1	7	2	5	3	4
65	6	1	7	2	4	3	5
66	5	3	7	2	4	1	6
67	5	1	6	3	4	2	7
68	6	1	4	2	5	3	7
69	1	6	7	2	4	3	5
70	6	5	3	4	7	1	2
71	3	2	7	1	4	6	5
72	3	4	7	1	6	2	5
Total	311	160	469	144	365	169	402

Mean of rank sum: 288.6

Sample size: 72

TPM…….Taste of poultry meat

LFP…….Low fat content of poultry meat

RCP……. The relative cheaper price of poultry meat

IEC…….Its easiness to cook

ICC……Increased income of consumers

URB……Urbanization

ASP ……As a result of its availability in ‘spare parts’ to satisfy all kinds of consumers

Appendix G: Regression Results for the Estimation of Demand and Supply of Locally Processed Poultry Meat

1. Estimated Demand

Regression model for the estimation of demand for locally processed poultry meat**:** $D_{LP} = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + U_t$

Regress D_{LP} X_2 X_1 $X_4$$X_{11}$ X_6 X_5 X_9 X_{10} X_{12} $X_3$$X_7$ X_8

Source	SS	df	MS	Number of obs = 108
Model	123.153196	12	10.2627664	F(12, 95) = 7.30
Residual	133.57597	95	1.40606285	Prob> F = 0.0000
Total	256.729167	107	2.39933801	R-squared = 0.6797
				Adj R-squared = 0.6140
				Root MSE = 1.1858

D_{LP}	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
X_1	-.4402165**	.2180658	-2.02	0.046	-.8731319	-.0073011
X_2	.0075765***	.0011513	6.58	0.000	.0052909	.009862
X_3	.320108	.2552798	1.25	0.213	-.1866866	.8269026
X_4	- .3219068***	.0564926	-5.70	0.000	.2097548	.4340589
X_5	.1012074	.2786814	0.36	0.717	-.6544599	.4520452
X_6	.0808104	.2568287	0.31	0.754	-.4290592	.5906799
X_7	.1445744	.2730354	0.53	0.598	-.3974695	.6866182
X_8	-.0417791	.2841394	-0.15	0.883	-.6058671	.522309
X_9	.2022739	.35666	0.57	0.572	-.9103335	.5057858
X_{10}	.8955458**	.4243236	2.11	0.037	.053157	1.737935
X_{11}	.04392	.0617021	0.71	0.478	-.1664142	.0785742
X_{12}	.2854868	.3266186	0.87	0.384	-.3629331	.9339068
_cons	-.1979908	1.198318	-0.17	0.869	-2.576952	2.180971

2. Estimated Supply

Regression model for the estimation of supply of locally processed poultry meat**:** $S_{LP} = \beta_o + \beta_1 Y_1 + \beta_2 Y_2 + \beta_3 Y_3 + \beta_4 Y_4 + \beta_5 Y_5 + \beta_6 Y_6 + \beta_7 Y_7 + \beta_8 Y_8 + \beta_9 Y_9 + \beta_{10} Y_{10} + U_t$

Regress $\ln\_S_{LP} Y_9 Y_4 Y_5 Y_{10} \ln\_Y_3 Y_2 Y_1 Y_7 Y_8 Y_6$

Source	SS	df	MS	Number of obs = 36
Model	22.8102733	10	2.28102733	F(10, 25) = 2.23
Residual	25.6186983	25	1.02474793	Prob> F = 0.0510
			Adj R-squared	R-squared = 0.5410
Total	48.4289715	35	1.3836849	Root MSE = 1.0123

$\ln\_S_{LP}$	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
Y_1	.1818195**	.0817331	2.22	0.035	.0134871 .3501519
Y_2	.2394674	.2801699	0.85	0.401	-.3375532 .8164881
Ln_Y_3	-.3475491*	.1761963	-1.97	0.060	-.015334 .7104321
Y_4	-.0247305	.6912178	-0.04	0.972	-1.44832 1.398859
Y_5	.0037539	.0336628	0.11	0.912	-.0655759 .0730836
Y_6	-.300362	.4524807	-0.66	0.513	-1.232263 .6315395
Y_7	.1474459	.4733375	0.31	0.758	-.8274108 1.122303
Y_8	-1.014551***	.3959944	-2.56	0.017	-1.830117 .1989853
Y_9	-.0090265	.0277873	-0.32	0.748	-.0662554 .0482024
Y_{10}	-.4433011	.447481	-0.99	0.331	-1.364905 .4783032
_cons	2.166273	1.947495	1.11	0.277	-1.844669 6.177214

Appendix H: Selected Critical Values of *s* in the Kendall's Coefficient of Concordance

Values at 5% level of significance

k	N						Some additional values for $N = 3$
	3	4	5	6	7	k	*s*
3			64.4	103.9	157.3	9	54.0
4		49.5	88.4	143.3	217.0	12	71.9
5		62.6	112.3	182.4	276.2	14	83.8
6		75.7	136.1	221.4	335.2	16	95.8
8	48.1	101.7	183.7	299.0	453.1	18	107.7
10	60.0	127.8	231.2	376.7	571.0		
15	89.8	192.9	349.8	570.5	864.9		
20	119.7	258.0	468.5	764.4	1158.7		
Values at 1% level of significance							
3			75.6	122.8	185.6	9	75.9
4		61.4	109.3	176.2	265.0	12	103.5
5		80.5	142.8	229.4	343.8	14	121.9
6		99.5	176.1	282.4	422.6	16	140.2
8	66.8	137.4	242.7	388.3	579.9	18	158.6
10	85.1	175.3	309.1	494.0	737.0		
15	131.0	269.8	475.2	758.2	1129.5		
20	177.0	364.2	641.2	1022.2	1521.9		