UNIVERSITY OF CAPE COAST

LIVESTOCK PRODUCTION AND CONSUMPTION PRACTICES IN THE ASSIN SOUTH DISTRICT AND CAPE COAST METROPOLIS OF THE CENTRAL REGION OF GHANA

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BY

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Thesis submitted to the Department of Animal Science, School of Agriculture, College of Agriculture and Natural Sciences, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Philosophy degree in Animal Science

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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: Joshua Amoni

Supervisors' Declaration

I hereby declare that the preparation and presentation of this 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: Prof. Moses Teye

ABSTRACT

The study was undertaken in the Assin South District and Cape Coast Metropolis, both located in the Central Region of Ghana. The aim was to evaluate the practices of livestock production and meat consumption in these areas. The research used a descriptive survey design, involving 77 livestock farmers and 202 meat consumers selected purposively to respond to questionnaires. The data collected were analyzed using the descriptive statistical tool of the Statistical Package for the Social Sciences (SPSS) version 23, and the results were presented in frequency tables. The findings indicated that chicken was the most prevalent livestock species kept in the study areas, with the majority of livestock producers mainly focusing on poultry production. Livestock farmers in these areas primarily utilized intensive and semi-intensive housing systems for their animals. They reported experiencing multiple disease outbreaks annually, with Newcastle disease being the most common. In terms of consumption practices, beef was the preferred meat among consumers in the study areas. Additionally, the price of meat was identified as the primary factor influencing consumers' meat purchasing decisions. However, it was worrying to find out that animals known to be sick were sometimes slaughtered by some farmers as well as animals which were on treatment. There were instances where dead carcasses were dressed and sold for human consumption. As a result, it was recommended that the government, specifically the Ministry of Food and Agriculture, provide training programmes and workshops for farmers aimed at disease prevention, early disease detection and management practices. Furthermore, efforts should be made to educate consumers on the importance of avoiding the consumption of meat from animals that do not respond to treatment or those that died naturally.

KEYWORDS

Livestock production

Meat consumption

Chicken

Beef

Meat of sick animals

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DEDICATION

This work is dedicated to my Family, Colleagues and Loved ones who support me in diverse ways.

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FAO	Food and Agriculture Organization
FASDEP	Food and Agriculture Sector Development Policy
GHG	Green House Gas
GSS	Ghana Statistical Service
JHS	Junior High School
MoFA	Ministry of Food and Agriculture
NGO	Non-Governmental Organization
PRSP	Poverty Rural Strategy Papers
SHS	Senior High School
SPSS	Statistical Package for the Social Sciences
UN	United Nations
VSD	Veterinary Services Directorate
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

Background to the Study

Livestock production is intensifying due to the growing demand for animal products and increased awareness among consumers regarding food safety and quality issues (Owusu-Sekyere, Owusu & Jordaan, 2014). Particularly in the sub-Saharan Africa, there is notable trend towards greater emphasis on enhanced food quality and safety. Meat and its products hold a vital place in daily diets as a well-known protein source, making their characteristics crucial to consumers in ensuring their wholesomeness (Nkegbe, Aikins-Wilson, Assuming-Bediako, & Munkaila, 2013).

According to González *et al.* (2020), meat and meat products are significant sources of essential nutrients like proteins, iron, and vitamins in the human diet. Over the decades, there has been a notable increase in meat consumption worldwide since the 1960s, particularly accelerating from the 1980s onwards. Some studies suggest a substantial rise in meat supply, with figures ranging from a 204% increase between 1960 and 2010 (Basu, 2015) to as high as 500% from 1992 to 2016 (Katare *et al.*, 2020). This indicates a significant shift in dietary habits over the last century, including in Africa, where reliance on meat for protein has grown substantially. While plant-based products, like wheat, were the primary sources of protein in the 1960s, animal-derived products now contribute up to 58% of protein availability. Consequently, meat products currently serve as the primary protein source, with an average intake of 28 grams per person per day, constituting approximately 30% of total calorie consumption (Bonnet *et al.*, 2020).

Consumers often prioritize the appearance of meat when making purchases, but they may overlook its potential to harbour disease-causing microorganisms. The journey of microbiological infection typically begins on the farm and can extend to the end consumer (Nkegbe, Aikins-Wilson, Assuming-Bediako & Munkaila, 2013). Developing countries, particularly in Africa, commonly experience foodborne illnesses due to various factors such as poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, limited financial resources for investing in safer equipment, and insufficient education for food handlers (WHO, 2004). Animal-origin foods, including meat and fish, are often considered high-risk due to their potential to contain pathogens, natural toxins, and other contaminants (Yousuf *et al.*, 2008). Therefore, it is crucial to implement proper food hygiene practices when handling these products to mitigate potential health risks.

An increasing number of countries are recognizing the importance of assessing the safety and quality of food due to the growing awareness of how food can contribute to the spread of diseases and food-borne illnesses (Newell *et al.*, 2010). In Ghana, various markets are overseen by local authorities, yet there is often a lack of control over the handling, packaging, processing, and transportation of food, let alone monitoring food quality (Nkegbe *et al.*, 2013). To address this, the Ghana Food and Drugs Authority, the Ghana Standards Authority, and public health authorities have implemented significant policies aimed at preventing the production and sale of contaminated foods to ensure consumers receive food that meet high standards of health and nutrition (WHO, 2010). The Veterinary Services Directorate (VSD) is tasked with

ensuring the hygiene and inspection of meat, as well as monitoring animal health through ante-mortem and post-mortem inspections and overseeing operations at abattoirs (WHO, 2010).

Evidence indicates that food safety and quality play a crucial role in the development of both developing and developed countries, with food-borne diseases remaining a significant global concern despite advancements in production practices, inspections, and regulations (Scallan, Griffin, Angulo, Tauxe, & Hoekstra, 2011).).

In Ghana, livestock production mainly follows an extensive system, where animals roam freely with little to no shelter provided. Owners often overlook concerns regarding the animals' diet, hydration, and medical care, posing health risks to both the animals and potential consumers of their meat. Animals may ingest disease-causing organisms from contaminated food and water sources, or develop wounds from predator attacks, which can become breeding grounds for pathogens (Nuvey *et al.*, 2020).

In rural areas, farmers and individuals involved in livestock production typically show minimal concern for the health implications of the meat they consume. Diseased animals are sometimes slaughtered for household consumption, and in extreme cases, meat from animals that die naturally may be consumed without investigation into the cause of death (Onyimonyi *et al.*, 2013). Additionally, some farmers resort to self-medication practices, resulting in the misuse or overuse of drugs (Mutua *et al*., 2020). Animals that receive inadequate treatment and fail to recover fully are often sold as meat to food vendors, as farmers are unwilling to incur losses from animal deaths (Onyimonyi *et al.*, 2013).

Against this backdrop, this study explores the livestock production and consumption practices in two locations; an urban and rural setting in Ghana. This study would be beneficial in that, by examining livestock production and consumption practices in the Assin South and Cape Coast Metropolis through the lens of food and animal safety, stakeholders can identify challenges, gaps, and opportunities for improving food safety standards, enhancing animal health and welfare, and ensuring the sustainability of livestock production systems in the region. This holistic approach contributes to the protection of public health, the promotion of responsible livestock farming practices, and the development of resilient and inclusive agricultural food systems.

Statement of the Problem

Limited human resources, lack of education in food safety, and failure to enforce national food safety policies have led to the production of unsafe meat, as many farmers and meat vendors slaughter animals in unapproved facilities without regulation or standards (Nkegbe *et al.*, 2013). King *et al.* (2000) found that most meat consumers purchase from unlicensed sources, exposing them to zoonotic diseases like anthrax, bovine tuberculosis, trichinellosis, and taeniasis. WHO (2019) stated that three-fourths of emerging infectious diseases in humans are caused by zoonotic pathogens.

In Ghana, livestock farmers face additional problems associated with their production practices. Limited access to veterinary services and insufficient knowledge about animal health management exacerbate the risks of disease transmission. Many farmers rely on traditional practices, which may not align with modern biosecurity measures, increasing the vulnerability of their livestock to infections (Duncan *et al.*, 2019). Furthermore, inadequate

infrastructure for animal disease monitoring and control limits farmers' ability to respond effectively to outbreaks, thereby threatening both animal and human health. The over-reliance on extensive systems also leads to land degradation, as grazing pressure can exceed the land's carrying capacity, resulting in decreased productivity and increased competition for resources (FAO, 2021).

The extensive production system, while cost-effective, poses challenges and public health risks. Animals in this system may become carriers of disease-causing organisms, unknown to farmers due to the lack of health surveillance. Farmers may also use these animals for meat, putting themselves at risk of health threats. Van Boeckel *et al.,* (2015) observed that freshly slaughtered animals may transmit new zoonoses because pathogens can evolve to cause diseases in new hosts. Annan-Prah et al. (2012) highlighted the absence or weakness of food safety control systems in Ghana, leading to alarming incidence of microbiological, chemical, and physical contamination in the meat industry. Consequently, ensuring high-quality and safer meat products with guaranteed food safety and quality standards has become a critical issue in Ghana.

Objective of the Study

The purpose of the study was to assess the livestock production and consumption practices in the Assin South district and Cape Coast metropolis of the Central Region of Ghana.

Specific Objectives

(i) To assess the predominant livestock species reared by farmers in the study areas.

(ii) To identify the livestock management practices in the study areas.

(iii) To identify the challenges faced by livestock farmers in the study areas.

(iv) To determine the meat preferences of consumers in the study areas

(v) To identify the determinants of meat preference by consumers in the study area.

Significance of the study

The significance of this study can be viewed in four ways: These are to the government, livestock farmers, researchers, and meat consumers. In respect of the government, this study will provide a roadmap towards augmenting livestock production in the country. The study seeks to take a critical look at the state of livestock production, the operational and financial challenges faced by livestock farmers and how those challenges can be addressed by the government and relevant state agencies. Findings from the study will guide the government on how to collaborate, promote and enhance livestock production to meet the ever-growing demand for livestock and animal protein in the country. Consequently, this study could aid the government on how importation of livestock and livestock products could be reduced and local capacities increased.

For livestock farmers, this study would provide a guide on best management practices that can be employed on various farms for increased productivity. The study will further guide livestock farmers on the preferences of consumers in terms of meat consumption in Ghana. Livestock farmers can leverage on these preferences and increase their production and revenue.

For researchers, this study could contribute to the body of knowledge on livestock production and consumption practices in the Central Region. Therefore, future researchers will be guided by findings from this study and consequently focus their studies on other districts to compare and contrast the findings from the present study for consumers, this study will guide them on the need to purchase and consume wholesome and quality meat products at all times.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter review relevant literature on the topic under discussion. The chapter begins with an overview of what is to be covered in the chapter. The remaining part of the chapter details the conceptual and theoretical reviews. The livestock sector encounters the challenge of maintaining livestock productivity to enhance rural livelihoods in developing nations. The current understanding of livestock productivity remains inadequate, underscoring the necessity to refresh existing knowledge. Thus, there is a requirement to reassess available information to facilitate accurate analysis and conclusions based on new discoveries.

Global Livestock Production Systems

Globally, livestock production occurs in diverse ways, offering a wide range of goods and services. Despite this variety, certain patterns have emerged, leading to the categorization of various livestock production systems. These systems are often classified based on land use, including industrialized (or landless) systems, mixed farming and grazing systems (Amede *et al.,* 2009). Understanding these systems is crucial for policymakers to address food safety challenges in global livestock markets.

Livestock production is undergoing rapid transformation, evidenced by its increasing contribution to meeting global need for high-value food products and protein sources. This transformation involves adjustments in resource utilization, operation size, product focus, and channels of marketing the products (Steinfeld *et al.,* 2006).

According to Steinfeld *et al.* (2006) livestock production systems can be categorised as follows:

Grazing systems: These involve livestock operations with a stocking rate of fewer than 10 livestock units per hectare, where more than 10% of the feed is produced on the farm, primarily through pasture grazing.

Mixed farming systems: In these systems, over 10% of the feed is composed of crop residues and by-products generated on the farm, while livestock farming activities account for more than 10% of the total production value.

Industrial systems: These systems rely on less than 10% of farm-produced feed, with an annual stocking rate exceeding 10 livestock units per hectare of agricultural land.

Pastoral systems: This entails stationary animal rearing in one location.

Nomadic systems: These systems entail relocating livestock from one location to another in pursuit of grazing areas.

Overall, these categories provide insight into the various approaches and practices within livestock production systems.

Mixed farming stands out as the largest animal production system globally, particularly notable in developing regions where a significant proportion of ruminants are raised within these systems, often relying on crop residues and by-products as crucial components of their diets (Amole *et al.*, 2022). In Asia and Africa, mixed systems play a pivotal role in ruminant production, while grazing systems are predominant in Latin America. However, for pigs and poultry, industrial systems tend to dominate in Asia. Grazing systems, covering nearly half of the world's usable surface, support vast numbers of sheep and goats, ranging from productive pastures in South America to arid

regions in Africa and Asia. Livestock serves as a vital income source for farmers across several jurisdictions (Amede *et al.*, 2009).

Small-Scale Livestock Production

There's no single agreed-upon definition for small-scale livestock production, which is often used synonymously with phrases like “smallholder, subsistence, and family agriculture, or characterized as lacking resources, being low-income, low-input, low-output, or low-tech in terms of livestock management. Small-scale livestock keepers account for approximately 85% of all livestock operations worldwide. The definition of smallholders can differ, such as dairy farmers who have fewer than six milking animals or less than 3 hectares of land, or pastoralists who have fewer than 30 small ruminants or less than 200 poultry”, as per the FAO (2009a). Smallholder livestock keepers typically work with limited resources in comparison to larger producers, often lack formal education and training, and frequently raise livestock in communal or landless environments. Small-scale livestock activities are usually run by families, concentrating on subsistence farming or a mix of subsistence and commercial activities.

The family acts as the main workforce, with raising livestock often being the main way small-scale farmers make money. They encounter difficulties in getting the necessary supplies, reaching markets, accessing services, and obtaining loans, and their dealings in the market mostly happen in unofficial local markets, where they sell products that are either traditional or local. Getting high-quality supplies and getting their products recognized in the market involves high costs for transactions. Small-scale farmers usually depend on inputs they can get themselves or from nearby sources, like grazing

areas, which helps maintain a closed cycle of nutrients. They work at the lower part of the production scale but see significant improvements in productivity.

Rangelands represent the largest land use system globally and are predominantly found in arid and semi-arid regions, where many of the world's poor and vulnerable populations reside (Seré *et al.,* 2008). The majority of cattle and small ruminants are concentrated in developing countries, although their distribution varies based on cultural, climatic, and economic factors (Adams *et al.,* 2021). With improving economic conditions, there's a corresponding increase in the consumption of animal-based foods (Adedokun *et al.,* 2018). Increasing numbers of people, higher earnings, and changing tastes in food are leading to a substantial increase in the need for animal-based food products. The process of globalization is also making it easier for the exchange of materials and goods related to animal farming. It is expected that the production of meat will more than double by the year 2050, showing the rising demand that is driven by alterations in food choices, increases in wealth, and population growth (Steinfeld *et al.,* 2006; Komarek, 2021). As a result, livestock production has emerged as the quickest-expanding area within the agricultural sector in numerous developing and emerging nations (FAO, 2009b).

Global Livestock Practices

Breeding Management

Breeding management encompasses various activities such as selecting breeding animals, controlling mating, removing unwanted animals through culling or selling, and determining the required number of animals to cover all

females. In small-scale livestock farming, animals from different owners are often mixed while foraging, and animals without a male in the herd depend on males from other herds for reproduction, making mating ineffective and having a detrimental effect on herd productivity (Gyamfi, 2006). Animals raised in extensive systems experience increased levels of inbreeding, resulting in loss of hybrid vigor, increase in deleterious traits, and decrease in heterozygosity, all of which pose serious problems for efficient breeding (Darwin, 1868). According to FAO (2009b), poor farmers may not prioritize ideal animal traits as much as formal breeding societies do. Instead, they strive to maintain optimal herds with diverse pedigrees and functional traits, prioritizing quantity over quality. Breeding goals often emphasize adaptive traits rather than performance traits. This is influenced by aesthetic preferences, religious requirements and behavioral traits such as temperament, maternal ability, hardiness and loyalty.

Routine Operations

In livestock management systems, routine tasks like record-keeping, castration, dehorning, and identification are common but are adapted and modified to varying extents. Castration is primarily performed to ensure docility in oxen, typically on animals up to two years old or sometimes older, with the vas deferens often crushed using a burdizzo. Dehorning, while practised, is not widespread and is typically conducted on animals under six months old (FAO, 2009a).

Vaccinations and inoculations play a crucial role in animal health but are less utilized in many developing countries due to the high costs and limited availability of animal health technicians to implement such programs.

Grazing Management

Grazing management plays a crucial role in effectively utilizing pasture resources. Decisions regarding stocking rates, grazing heights, and grazing system; whether rotational or continuous, are pivotal for achieving desired outcomes in pasture utilization (Sollenberger *et al.*, 2009). However, in tropical regions, a large part of grazing animals are kept under the extensive system with minimal inputs for intensification. Forage utilization in tropical areas varies widely, including methods like cut-and-carry systems, penned animals with controlled feed intake, tethering, and continuous grazing both day and night across different regions worldwide (Ndambi *et al.*, 2018).

Some households may provide regular salt or other supplements during the dry season, while young animals may be restricted from grazing until they are 3–4 months old, but supplementary feeding practices are not widespread (Sulemana, 2012). Overgrazing is a serious problem that causes rapid deterioration of natural resources. Effective management of communal pastures aims to improve livestock nutrition by ensuring consistency of grazing and improving grazing quality. This involves proper fencing, grazing management, and determining current carrying capacity, but it requires cooperation and commitment from farmers (Nuvey *et al.*, 2020). Insufficient feed supply, particularly during winter or dry seasons, significantly impacts livestock production in communal areas. After harvest, animals often eat crop residues in agricultural fields (Nuvey et al., 2020).

Global Effects of Livestock on the Environment

The rise in global food demand due to population growth is expected to lead to a doubling of meat and milk production worldwide (FAO, 2009).

However, animal production, particularly ruminant farming, exacts a considerable environmental toll both locally and globally (Adu, 2011). Intensive operations contribute to local environmental degradation through contamination of "air, land, or water with nitrogenous and phosphorus compounds", while both intensive and extensive systems contribute to global environmental impact through greenhouse gas emissions (Newbold *et al.*, 2010). These emissions are relatively lower in developing nations like Ghana due to smaller livestock populations. Ruminant production systems primarily emit methane (CH4) from rumen fermentation, while pig waste releases nitrous oxide (N2O). However, the intensification of ruminant systems can shift the environmental impact towards increased N2O emissions (Newbold *et al.*, 2010). Increasing demand for livestock products will increase pressure on the natural resources that support the livestock industry. Due to population growth and the competing needs of people and livestock, these pressures will intensify competition for land use, resulting in pollution, erosion, degradation of plant and animal species, and loss of biodiversity. In extensive grazing and mixed livestock systems, competition for resources influences the land use decisions of smallholders and leads to the conversion of forest land to pasture and cropland (Nath *et al.*, 2016).

Global Drivers of Demand for Animal Production

Livestock production provides a variety of resources, including milk, meat, labor, transportation, income, and manure, encouraging people to participate in livestock farming(Ndambi *et al.*, 2018)). In many developing economies, households depend heavily on income from a variety of sources, including agriculture, horticulture, livestock farming, and wages. Among

these, electricity, transportation, meat, and milk are important sources of income from livestock activities (Ndambi *et al.*, 2018). Livestock sales contribute significantly to household income in South Africa, accounting for more than 25% of total income in the food security sector (Freeman *et al.*, 2008). Individual livestock consumption patterns are closely related to per capita income, with higher incomes generally leading to increased consumption of meat, milk, and eggs, making these products staples in the daily diet (Steinfeld *et al.*, 2006). In high-income countries, per capita meat consumption typically ranges from 80 to 130 kg per year (Steinfeld *et al.*, 2006). Economic growth in developing countries has been remarkable, with an average annual growth rate of 3.8% (1.8% per capita) from 1991 to 2001, surpassing the 2.9% growth rate recorded in the previous decade (Steinfeld *et al.*, 2006). East Asian countries, especially China, have achieved rapid economic growth, averaging 7.4% (6.2% per capita) per year during the same period (World Bank, 2005). South Asia and the Middle East have also witnessed significant economic growth, with GDP growth rates of 5.5% and 4.4%, respectively (Steinfeld *et al.*, 2006). However, Latin America and sub-Saharan Africa (2.6%) experienced more modest economic growth during this period (2.9% per year) (Steinfeld *et al.* 2006). In addition to rising incomes, global population growth is driving the demand for animal products. The population of developing countries is growing by about 72 million people per year, increasing the demand for food (Steinfeld *et al.*, 2006). This presents an opportunity for livestock farmers in these regions to benefit from the growing demand. Furthermore, rapid urbanization, with an estimated 68% of the world's population living in cities and towns in developing countries by 2050,

will further increase the demand for livestock products (UN, 2018). Urban populations tend to have higher incomes than rural populations, which increases their consumption of animal products. To meet the growing demand for animal protein in developing countries, total livestock production in sub-Saharan Africa is expected to increase significantly each year (Abdulai, 2022). This growth provides opportunities to improve the livelihoods of poor communities. In this context, achieving sustainable growth in livestock production is essential to meet the needs of a growing population, highlighting the important role of livestock production in smallholder farming systems (Abdulai, 2022)

Livestock Production in Ghana

There are two main livestock systems in Ghana: the mixed farming system, which is dominated by smallholder farmers, and the pure livestock system, which focuses on beef production, which is predominant in the northern region (ADF, 2001). The mixed farming system is the most common in Ghana (Abdulai, 2022). Some farmers engage in commercial farming, especially in rural areas, where they rear animals and feed them prepared feed. The livestock sub-sector is dominated by smallholder operators, who are mainly crop farmers who raise animals to supplement their income or for safety reasons (Baah *et al.*, 2012). Although Ghana has several well-established commercial poultry and pig farms (Ministry of Foreign Affairs, 2010), data on the country's livestock population are generally lacking.

According to the Ministry of Food and Agriculture (MoFA, 2009), domestic meat production in Ghana rose from approximately “77,235 metric tons in 2003 to 101,895 metric tons in 2008, marking a 32% increase over the

period. Poultry contributed the largest share of total domestic meat production, followed by beef". Livestock populations are concentrated in the Guinea and Sudan Savannah vegetation zones of northern Ghana, with fewer cattle in the transitional and humid forest zones due to the prevalence of tsetse flies transmitting trypanosomiasis (Abdulai, 2022). Small ruminants and poultry are more evenly distributed throughout the country, while the Northern and Upper West regions account for about 40% of Ghana's pig population, with Southern Ghana hosting a higher proportion of intensively housed pigs.

Domestic livestock production has shown gradual growth over the past decade. "Between 1991 and 2000, production levels increased by 13% for cattle, 26% for sheep, 35% for goats, and 21% for pigs (MoFA, 2004). Offtake rates for cattle are approximately 11%, while for sheep and goats, it's around 30%, which compares favourably with rates in purely pastoral systems in Sub-Saharan Africa. In the year 2000, Ghana produced 20,000 tons of beef, 6,000 tons of goat meat, 7,000 tons of mutton, 9,000 tons of pork, and 27,000 tons of milk. Animal skins and hides are processed domestically for both the local and export markets, with an estimated annual production of 2,000 tons of cattle hides and 1,000 tons each of goat and sheep skins" (MoFA, 2004).

Livestock Development Policies and Strategies in Ghana

The agricultural sector plays a pivotal role in Ghana's economic growth and development, with a focus on leading the economy's structural transformation and maximizing the benefits of accelerated growth (MoFA, 2004; Aning *et al.*, 2008). Agriculture's productivity improvements are essential for enhancing the real incomes of Ghanaians and achieving several

Millennium Development Goals (MDGs), including poverty eradication, hunger alleviation, universal primary education, gender equity, child mortality reduction, and environmental sustainability, particularly concerning livestock (MoFA, 2004).

The Ministry of Food and Agriculture (MoFA) serves as the principal agency responsible for the agricultural sector, coordinating plans and programs through policy and strategy frameworks. Notably, MoFA has facilitated the formulation of the Food and Agriculture Sector Development Policy (FASDEP II) and the Medium-Term Agriculture Sector Investment Plan (METASIP), 2011-2015 (MoFA, 2015). FASDEP II outlines the government's long-term policy objectives for agriculture, aimed at positioning stakeholders to exploit emerging opportunities, while METASIP serves as the investment plan to implement medium-term programs aligned with achieving a target agricultural GDP growth of at least 6% annually and halving poverty by 2015, consistent with MDG 1 (MoFA, 2015).

Furthermore, METASIP aligns with regional frameworks such as the "ECOWAS Agriculture Policy and NEPAD's Comprehensive Africa Agriculture Development Programme (ECOWAP/CAADP)", providing an integrated approach to support agricultural growth, rural development, and food security across Africa (MoFA, 2010). Since independence, various governments have initiated agricultural projects with explicit roles for livestock in economic development, often supported by financial allocations from national budgets. Additionally, several Non-governmental Organizations (NGOs) have launched projects to bolster rural livelihoods through livestock

activities, including vaccinations, livestock supply to farmers, and training for livestock keepers and veterinary officers (MoFA, 2004).

The MoFA's vision for livestock development in Ghana envisions a "modernized, efficient, and profitable livestock sector that can sustainably meet the country's needs, support livelihoods, reduce poverty, and promote national economic growth".

The broad goals of the policy include;

- "To increase the supply of meat, animal and dairy products from the current aggregate domestic production level of 30% to 80% by 2015".
- "To contribute to the reduction of the incidence of poverty among food farmers who are livestock keepers from 59% to 30% by 2015. The specific goals for major livestock population by 2015 were outlined by MoFA (2004) as; To increase the population of cattle from 1.3 million heads to 3.2 million, sheep from 2.9 million heads to 14.8 million, goats from 3.4 million heads to 36.1 million, pigs from 310,000 heads to 5.1 million and poultry from 24.3 million to 89.2 million".

Challenges of Livestock Production

Inadequate Quantities and Quality of Livestock Feed and Nutrition

In developing nations, the main factor restricting cattle output is feed quality and availability (Amole *et al.,* 2022; Herrero *et al.,* 2013). The quantity and nutritional value of range grasses decline dramatically in areas such as northern Ghana during the dry season, making it difficult for livestock to maintain their body condition and weight on this fodder alone (Ziblim *et al.*,

2015). Animals that receive inadequate nutrition are more vulnerable to illnesses and parasites, and their genetic capacity for producing meat and milk is also limited (Mahaboubil-Haq and Adzitey, 2016).

In tropical Africa, browse species are crucial to the sustenance of livestock, including sheep, goats, and cattle (FAO, 2006). Particularly in intensive production systems where their meals require appropriate concentrates of proteins, starchy staples, and vital micronutrients, monogastrics—who are particularly sensitive to nutrient quality and balance—face difficulties (Herrero, 2021). There may be rivalry between these nutritional components and human consumption needs, particularly for coarse grains.

Women in Ghanaian regions such as the Upper East and Northern regions supplement their income by gathering and selling crop wastes to traders or as animal feed (MoFA, 2009). The main problems for ruminants are seasonal feed shortages and the inability of fibrous foods such as agricultural leftovers and forages to be readily digested (Lamidi & Ologbose, 2014). Since many tropical plants have developed structural and phytochemical defenses against herbivores and pests, they present extra difficulties because of their anti-nutritional elements, which include poisons and indigestible compounds. To address these issues, research has been done in tropical areas on the supply and usage of non-conventional feed (Lamidi & Ologbose, 2014). Smallholders continue to adopt the technology, but at a limited rate for a variety of reasons. These include a dearth of comprehensive approaches that match farmers' needs with alternative solutions, a lack of systematic research efforts, and a

lack of knowledge regarding the physiological responses of animals to seasonal feed fluctuations (Nath et al., 2016)

Stock Theft

According to Khoabane and Black (2009), livestock theft exacerbates poverty by affecting both the unemployed and drought-affected crop farmers. This crime diminishes households' ability to consume returns on their assets and hampers their capacity to sell animals to acquire essential goods. Livestock theft directly undermines the livelihoods of subsistence farmers (Reist *et al.*, 2007). Livestock theft is a significant worry for women in the West Gonja and Saboba–Cheriponi Districts, according to Gong (2005) and Nuhu (2004), respectively. They ascribed this issue to the widespread habit of letting animals go amok at night, which is made worse by the region's illicit small-scale mining operations. Gong (2005) also noted that women's involvement in livestock raising is discouraged by livestock theft.

Access to Water

Amede et al. (2009) contend that growing agricultural demand, climatic changes, and improper land use are the root causes of the impending problem of water scarcity. While increasing livestock production offers economic advantages, it also has the potential to deplete water resources and exacerbate water scarcity locally and globally. Limited understanding of the interactions between livestock and water often results in low productivity, hampers effective resource management decisions, and undermines the potential benefits of agricultural water use across sub-Saharan Africa (Lamidi

& Ologbose, 2014). Animals require significant amounts of water for their daily metabolic functions, and the water content in their feed directly influences their water needs (Mellor, 2016). Given that even a small deficit in water intake can lead to severe health issues and fatalities (Karbo *et al.*, 2005), it's crucial to ensure adequate water provision, particularly for pregnant and lactating animals, to maintain body fluid balance and support milk production for offspring. Adopting innovative approaches is imperative to enhance water productivity and address the growing concerns surrounding water scarcity.

Animal Diseases

Animal diseases are a significant obstacle to smallholder livestock production in developing countries (Mutibvu *et al.,* 2012). According to Tyler (1990), high disease prevalence can profoundly affect livestock by reducing appetite and metabolic rates, causing weight loss, slowing growth, and diminishing productivity. The sale of mature animals may be delayed as a result of these variables delaying maturity (Tyler, 1990). According to Abdulai (2022) disease risk also makes investments in and intensification of cattle production difficult. Due to insufficient disease management methods or a lack of appropriate solutions, smallholder livestock keepers frequently find it difficult to manage livestock diseases (Abdulai, 2022). Much of the developing world's livestock productivity is still severely hampered by endemic and epidemic illnesses, especially in tropical areas. The two main causes of livestock death are diseases and pests (Abdulai, 2022). . Numerous elements, such as weather patterns and management techniques, have an impact on the health of animals (Adzowu-Tsri, 2005). Adzowu-Tsri added that while though native breeds are sometimes thought of as resilient and durable,

poor management can nevertheless have a detrimental effect on their effectiveness.

Adult animals should have their worms treated after the conclusion of the rainy season and just before the start of the rainy season, advises Fordjour et al. (2006). Adams *et al.* (2021) emphasized the value of ethno-veterinary practices, which are customary techniques farmers employ to preserve the well-being and production of their livestock at a low cost. FAO (2004) noted that because impoverished people usually lack the financial means to pay for veterinary care, animal diseases represent a major obstacle to their ability to generate money and accumulate assets. Small ruminants in Africa are frequently afflicted with brucellosis, coccidiosis, pneumonia, and contagious caprine pleura pneumonia, among other illnesses. Even though any one of these illnesses might not be particularly problematic on its own, when combined or occurring in unfavorable circumstances, they can cause significant losses (Kumah, 2006).

Policies and regulations often impede the development of sustainable livestock production techniques that have the potential to alleviate poverty (Adams *et al.*, 2021). Large-scale or developed country producers are frequently favored by subsidies and price controls placed on the input and output markets, which disadvantages smallholders in developing countries and urban consumers at the expense of rural livestock farmers (Mutibvu *et al.*, 2012). Disincentives such as inadequate or improper property rights and environmental legislation fail to protect the natural resources necessary for animal husbandry and fail to take into account the costs of environmental degradation to society (Addulai, 2022).

The sustainable development of livestock is hampered by the lack of institutions and policies that reduce risks, open up markets, offer credit, and promote investment in livestock services like breeding, health care, and feeds. They also lack support for livestock research and extension (Adzitey, 2013). The Poverty Reduction Strategy Papers (PRSP) show that although livestock has the potential to drastically lower poverty, it is nonetheless excluded in many initiatives for rural development (FAO, 2010). Government subsidies for the development of infrastructure and services do in fact encourage the raising of livestock, but these programs usually help commercial farmers at the expense of the difficulties experienced by rural poor livestock keepers (FAO, 2010). In the upcoming years, it is anticipated that developing countries' need for animal products will increase dramatically. However, sanitary limitations, tariffs, and other trade barriers frequently make it difficult for smallholders in these areas to access international markets (MoFA, 2004). Governments may require the killing of afflicted animals during disease outbreaks without offering compensation, which significantly disadvantages smallholder livestock farmers. Extreme weather events like desertification and water shortages are caused by environmental factors like global warming, which mostly affect the poor populations in subtropical and tropical countries (MoFA, 2004). Lack of water and fodder increases the difficulty and expense of raising cattle, especially for small-scale livestock keepers who might not have the resources.

Access to Market Information

Once livestock farmers transition from producing solely for home consumption to earning income from livestock, they encounter challenges

related to market access and conditions. Since most animal products perish quickly, smallholders, in particular, rely on dependable transportation, pricing, and demand information to avoid risk. In rural areas, there are numerous informal butchers whose operations are often unsupervised, posing public health risks (Ghana Livestock Review, 2010). Moreover, the lack of modern abattoirs in many parts of the country, coupled with inadequate facilities and poor sanitation in existing slaughterhouses, exacerbates these challenges (Ghana Livestock Review, 2010). Currently, only a few modern abattoirs are situated in Kumasi, Tamale and Tema (Ghana Livestock Review, 2010).

Inefficient livestock processing practices contribute to limited value addition and economic inefficiency. Livestock processing primarily occurs locally in the North, with all processing for the Southern market conducted in the South (FAO, 2009a). Because of weight loss during transit, this leads to lower carcass weight and economic value for live animals and greater transportation costs for processed meat. In comparison to commerce between northern and southern markets, value creation along the supply chain from the farm gate to local markets in the North is negligible. Very few animals are fattened before being sold, which is a lost chance to add value. The price difference between farm gate and local market pricing in the North is mostly driven by transportation costs. On the other hand, consumers in southern cities pay a large markup, and the difference in price is not passed down to players in northern marketplaces.

Extension and Veterinary Services

In many countries, especially in the developing world, budgetary constraints in the public sector have had a substantial influence on veterinary

services and extension, resulting in fewer field visits by employees even while their salaries are paid (MoFA, 2008). Smallholder farmers are hesitant to pay costs for veterinary services as they are no longer subsidized, which leads to a low use of these services. Veterinarians therefore frequently concentrate on commercial farmers and contemporary poultry businesses, which make up a small fraction of livestock producers in the North but are more prepared to pay fees. A significant portion of the para-vets who were trained at the veterinary college in Pong-Tamale also have no job; some have started enterprises in the Northern Regions to provide emergent farmers with services in exchange for a fee, while others do not have a job. MoFA and non-governmental organizations have been working to provide training for Community Livestock Workers (CLWs), who provide basic para-veterinary services to other farmers at a discounted rate. Nevertheless, in spite of these efforts, owners of cattle and small ruminants underutilize veterinary services, which raises death rates in the late 2000s (MoFA, 2008).

Drought is a major obstacle to sustainable development in Africa, according to the UN (2007), with far-reaching effects on infrastructure, natural resource availability, economic activity, human health, food security, and environmental and international security. Drought is a common occurrence in arid and semi-arid regions and can have a substantial effect on natural rangelands and animals. In 1999, Wardeh listed the main ways that drought affects livestock:

Reduced access to natural feed supplies results in reduced rates of conception in animals because of inadequate and delayed weight recovery during rainy seasons. As the dry season wears on, stress levels rise and

miscarriages and stillbirths rise as well. As a result, there are fewer calvings in the following years, which is exacerbated by higher rates of young cattle mortality. Due to their restricted availability to natural feed sources, female animals produce less milk and may stop nursing altogether below a particular intake threshold. The nutritional state and consumption patterns of households who depend on milk for their requirements are impacted by this decline in milk output. When grazing becomes sparse, livestock's weight declines, which reduces their value as meat animals and impacts their usefulness for labor and transportation. Reduced live weight and increased susceptibility to illnesses, which primarily affect the very young, elderly, and pregnant animals, are associated with higher mortality rates. As livestock keepers try to get as much value out of their animals before they die and to raise money for food for the family, herd sales rise dramatically. Depending on the wealth of their animals and their access to other resources, herd owners experience the effects of drought differently. Larger livestock owners typically suffer proportionately less losses than smaller ones (FAO, 2014).

Land Ownership

For grazing animals like sheep, goats, cattle, and camels to survive, equal access to grazing land and water is necessary. However, wealthy farmers, tribal chiefs, city people, or the government frequently hold authority over grazing rights and land, as opposed to low-income livestock keepers, families, or communities. Poor farmers who do not own property are therefore forced to graze their cattle on marginal grounds like roadside ditches or isolated locations (Reist *et al.*, 2007). For small-scale livestock caretakers across Africa, losing access rights to resources is a major problem (Gura,

2008). Grasslands are often considered collective property in many developing nations, especially in Asia and Africa, which makes efforts to increase productivity even more difficult (Steinfeld *et al.,* 2006). These difficulties are made worse by the lack of organizations or laws controlling the distribution and use of natural resources.

Benefits of Livestock Production

Many poor people in the developing world depend heavily on livestock rearing for their livelihoods since it frequently improves different aspects of well-being and provides a means of escape poverty (Stroebel *et al.,* 2010). Livestock serves a variety of purposes in small-scale farming systems that go beyond simple economic gain and may involve activities unrelated to sales. These benefits include things like food production, revenue generation, manure provision, electricity generation, financial stability, and social status enhancement (FAO, 2009b). Researchers have referred to these benefits as non-market functions, intangible goods, or Z-goods. Since these non-market benefits are frequently disregarded, it is crucial to acknowledge them while evaluating the significance of various livestock production techniques and regional breeds. According to researchers like Van Rooyen (2008), Pell *et al.* (2010), and Vandamme *et al*. (2010), livestock production plays a variety of roles in emerging environments. Livestock has an economic impact on the production of fertilizer, traction power, income, and food security. They also present excellent investment opportunities and assets. Livestock has a social role in promoting connections, addressing gender inequality, and facilitating the fair sharing of benefits. Livestock owners are expected to take on the role of stewards of natural resources due to the growing significance of

environmental protection. According to Randolph *et al.* (2007), the livestock systems that underprivileged communities adopt are a reflection of their limited access to knowledge and financial services, as well as their lack of land. Households that produce livestock benefit from a variety of factors, including social prestige, money generation, financial stability, food and nutritional security, and manure provision (WHO, 2019)

Providing Food and Nutritional Security

Poor communities' livestock are vital sources of nutrient-dense animal-based foods that add to dietary diversity and act as key supplements, particularly in areas where plant-based diets are the norm (Ndlovu, 2010; Haileselassie *et al.*, 2013). These dishes derived from animals are usually available during times when livestock are ill or not productive, as well as for special occasions like ceremonies or host events. Meat and dairy products, which are sourced from animals, are great sources of vital vitamins, minerals, and high-quality proteins (MoFA, 2004). Children who consume these goods, even in tiny amounts, can benefit from the treatment for conditions like stunted growth, impaired brain development, and general illness (Font-I-Furnols, 2014).

Serving as Financial Instruments

Regarded as a "living savings account," livestock functions as a type of savings or accumulated capital and, notwithstanding associated dangers, provides a strong hedge against inflation (Swanepoel and Moyo, 2010). Owning animals gives families assets that can be liquidated in times of need, serving as an alternative type of insurance. Poor rural livestock caretakers see their animals as a "bank account on legs," generating interest in the form of

milk, meat, manure, wool, leather, and draught force (Reist *et al.*, 2007). Low-income farmers have a chance to strengthen their holdings and increase their profits due to the growing demand for animal products (FAO, 2019).

Generating Income

According to Freeman *et al.* (2008), livestock plays a vital part in risk management and essentially acts as a "safety net" for households, frequently being sold during difficult times (McDermott *et al.*, 2010). A substantial portion of total household income, especially for lower-income farmers relative to their richer counterparts, comes from livestock sales, which are a source of emergency cash for many households (FAO, 2009a). Furthermore, animal traction services offer farmers another revenue stream (Amede *et al.*, 2009). Many people find work and income in the small ruminant sector, which also improves farmers' livelihoods and income diversification—both of which are closely related to increased food security (Avoka, 2007; Yarig, 2004). Additionally, animals are a strategic source of income for households, enabling them to buy food and necessary agriculture inputs at crucial times, so promoting food security and reducing poverty (Yidana *et al.*, 2006).

Livestock uses manure to increase crop yields, which helps to produce food in Africa, Asia, and some Latin American countries (Pell *et al.*, 2010).

However, the amount to which manure increases crop output varies greatly based on a number of parameters, including soil type, nutritional condition, and manure application techniques (Amole *et al.*, 2022). =Furthermore, some areas use cow dung as a fuel source, highlighting the significance of cattle in developing nations for the provision of fuel and other necessities in addition to food (Steinfeld *et al.*, 2006).

Enhancing Social Status

Stronger social ties are fostered in communities where a family's willingness to share cattle with others or the quantity of their animal holdings determines their social status. Particularly small ruminants are important to human connections because they are often given as presents, sacrifices, dowries, and other forms of payment for social duties (Yanggen, 2019). Furthermore, small ruminants have a social role in a variety of rites, including religious gatherings, marriages, and funerals (Lesia, 2009). Higher social standing can impart influence within the group or allow access to a wider range of resources (Stroebel *et al.,* 2010). Smallholder livestock keepers usually maintain mixed herds of cattle, sheep, and goats of different breeds, utilizing tactics to improve their survival and make the best use of their surroundings (Gura, 2008). Owning livestock denotes not only financial ownership but also social validation and cultural anchoring for a large number of disadvantaged farmers. The desire to own as many large animals as possible so frequently results in overexploitation of natural resources, a phenomenon known as "the tragedy of the commons" (Reist *et al.,* 2007).

Livestock Production as a Source of Livelihood and Poverty Alleviation

For small-scale community cattle ranchers, achieving sustainable livelihoods is the main objective. Small animals are generally kept close to households or on shared land and are fed on agricultural residue since they require little financial input from poor livestock caretakers. When it comes to lessening the impact of crop failures, which are frequent in developing nations, livestock is essential. According to FAO (2009b), these areas are

home to a sizable percentage of the world's livestock, including 46% of sheep and goats and 29% of cattle.

Over two-thirds of the world's rural poor and a significant fraction of the peri-urban poor rely on livestock for their livelihoods, demonstrating the enormous potential of livestock to reduce poverty (Reist *et al.*, 2007). Even if those who are exceedingly poor might not have owned livestock at first, owning animals can be a means of escape from poverty. Comprehending poverty is crucial for long-term poverty alleviation. Poverty is defined as "severe deprivation of human well-being," including lack of access to resources, poor health, illiteracy, hunger, shock vulnerability, and little control over important decisions (MoFA, 2004). According to FAO (2009b), social, economic, and environmental factors interact in complicated ways at different scales to cause rural poverty. Unfavourable biophysical conditions, poor land quality, a labour shortage, economic isolation that drives up costs, a lack of collateral that restricts credit availability, a lack of job opportunities, low levels of education, meagre incomes that make it difficult to meet basic needs, unfavourable macroeconomic conditions, and low levels of empowerment are some of these factors. As a viable remedy, aggressive and expanded livestock production is required to address these issues (FAO, 2004)

Prospects for Reducing Rural Poverty

Increasing productivity alone does not ensure a significant decrease in poverty, particularly for those who raise cattle for non-commercial purposes. Several factors influence the possibility of increased livestock output to alleviate poverty. Existing demand in markets, such as the popularity of goat meat in local eateries ("chop bars") across the country. Favourable prices for

unconventional livestock products, are often produced by rural individuals with limited resources.

Livestock plays a beneficial role in poverty alleviation, as demonstrated by poor individuals who own livestock. These animals provide opportunities for escaping poverty and expanding asset ownership (MoFA, 2004).

Consumer Preferences for Different types of meat

Different types of meat are obtained from various animals (Akhigbe & Akaeze, 2023). To this end, chicken is obtained from birds, chevon from goats, mutton from sheep, beef from cattle and pork from pigs. Thus, consumers have a wide range of choices when it comes to the selection of meat. A study by Mahaboubil-Haq and Adzitey (2016) revealed beef as the most consumed meat in the Wa municipality of Ghana. Earlier studies by Adzitey (2013) also showed beef as the most valuable and widely consumed meat in urban areas in Ghana. The authors posited that beef is readily available and particularly cheaper compared to other types of meat. To add on, studies by Akinwunmi *et al.,* (2011) indicated beef as the preferred meat consumed by people in Ogbomoso, Nigeria. Similarly, Ogunwole and Adedeji (2014) identified beef as the most consumed meat among staff and students of the University of Ibadan, Nigeria. Despite these assertions by the aforementioned authors, some authors posited different types of meat apart from beef as the most preferred meat by consumers. For instance, a study by Tsegay (2012) showed chicken as the most preferred meat in Ethiopia. Similar studies by Jayaraman *et al.,* (2013) identified chicken as the preferred and most consumed meat in Malaysia.

This preference for chicken can be attributed to several factors, including its perceived health benefits, versatility in cooking, and lower price point compared to red meats (Dibba *et al.*, 2017). Moreover, consumer preferences for meat vary significantly across different cultures and regions. In some societies, pork is favored due to its flavor and culinary applications, as indicated by studies in various Asian countries where pork is a staple meat (Huang *et al.*, 2019). Additionally, cultural and religious beliefs play a critical role in meat consumption patterns. For instance, pork is avoided by Muslim and Jewish populations, leading to higher consumption of other meats, such as beef or chicken (Ain *et al.*, 2019).

Another significant trend influencing consumer preferences is the growing awareness of food safety and animal welfare. Research by Verbeke (2015) highlights that consumers are increasingly concerned about the ethical implications of meat production, which has led to a rise in demand for organic and free-range meat options. This shift in consumer behavior emphasizes the importance of transparency in meat sourcing and production methods.

Furthermore, the rise of plant-based diets has begun to reshape consumer preferences, particularly among younger generations who prioritize health and sustainability. A study by Neff *et al.* (2017) found that many consumers are reducing their meat intake in favor of plant-based alternatives, reflecting changing attitudes towards meat consumption overall.

In conclusion, while beef remains a dominant choice among consumers in certain regions, preferences for different types of meat are influenced by a multitude of factors, including cultural traditions, health perceptions, ethical considerations, and emerging dietary trends.

Factors that influence the choice of meat by consumers

Despite meat being posited as one of the major sources of protein, there exists preferential consumption in the choice of meat by consumers (Akhigbe & Akaeze, 2023). Such choices by consumers are influenced by several factors, notable amongst them include; socio-economic factors, religion, gender, and age (Tsegay, 2012) Others have also reported price, taste, income levels and availability as factors that influence their choice of meat (Mahaboubil-Haq & Adzitey, 2016; Ogunwole & Adedeji, 2014). Amongst all these factors, price happens to be the most significant predictor of the choice of meat by consumers (Akhigbe & Akaeze, 2023; Mahaboubil-Haq & Adzitey, 2016; Ogunwole & Adedeji, 2014). Some of these factors are explained below:

Socio-Economic Factors: Socio-economic factors, such as income level and educational background, significantly influence meat consumption patterns. Higher income levels often correlate with a greater variety and quantity of meat purchased, as consumers with more disposable income tend to opt for higher-quality cuts and a wider range of meat options (Fisher *et al.,* 2016). Conversely, lower-income consumers may prioritize affordability, leading to a preference for cheaper meats (Huang *et al.,* 2019). Furthermore, educational attainment can affect consumer awareness of nutrition and health implications, thereby influencing their meat choices (Kearney, 2010).

Religion: Religious beliefs play a crucial role in determining meat preferences. Certain religions have dietary restrictions that dictate which types of meat can be consumed. For example, Muslims and Jews strictly avoid pork, while Hindus often refrain from eating beef (Ain *et al.,* 2019). These

restrictions not only shape individual preferences but also influence broader market trends in regions with significant religious populations, leading to increased demand for permissible meat types.

Gender and Age: Gender differences also manifest in meat consumption patterns, with studies indicating that men are more likely to prefer red meats compared to women, who may lean towards poultry and fish (Fischer & Lentz, 2018). Age is another influential factor, as younger consumers, particularly millennials and Generation Z, show a growing inclination towards plant-based diets and alternative protein sources, reflecting changing dietary trends and health consciousness (Neff *et al.*, 2017). This generational shift may lead to a decline in traditional meat consumption as younger consumers prioritize sustainability and ethical considerations.

Price and Taste: Price remains a pivotal factor, as consumers often base their purchasing decisions on the affordability of different meat types. A study by Verbeke (2015) emphasizes that price sensitivity can significantly impact consumer choices, particularly in regions with fluctuating economic conditions. In addition to price, taste is a fundamental determinant of meat preference. Consumers often gravitate towards meats that they find palatable and enjoyable, which can vary widely across cultures (Dibba *et al.*, 2017). Flavor profiles, cooking methods, and cultural traditions all contribute to individual tastes, influencing which meats are favored.

Availability: The availability of meat types in local markets also affects consumer choices. Geographic location can dictate the types of meat that are easily accessible, which in turn influences consumption patterns. For instance, regions with robust livestock farming may have greater access to fresh beef

and lamb, while urban areas may offer a wider variety of poultry (Akinwunmi *et al.,* 2011). Seasonal availability of certain meats can also affect consumer choices, as some meats may be more readily available during specific times of the year (Huang *et al.*, 2019).

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter describes the research methods used in the study. It covers the research design, study area, population, sample size and sampling procedure, data collection instrument, data processing and analysis.

Research Design

The study employed the descriptive survey design. The justification of this design is to enable the researcher to obtain a large amount of data from a sizeable population (livestock farmers and meat consumers). Since this study involves describing, observing and documenting livestock production and consumption practices, the descriptive survey design was appropriate. The descriptive survey design is usually associated with the deductive approach (Kothari, 2004). It is a popular and common design employed by many and is most frequently used to answer who, what, where, how much and how many questions (Creswell, 2014). Often obtained using a questionnaire administered to a sample, these data are standardised, allowing easy comparison.

In addition, the descriptive survey design is perceived as authoritative by people in general and it's comparatively easy to explain and understand. The descriptive survey design allowed the researcher to collect quantitative data that was analysed using descriptive statistics. The descriptive survey design provided much control over the research process and sample. It aided the researcher in generating findings which are representative of the whole population at a lower cost than collecting data for the whole population (Kothari, 2004; Hesse-Biber & Nagy, 2011).

Study Areas

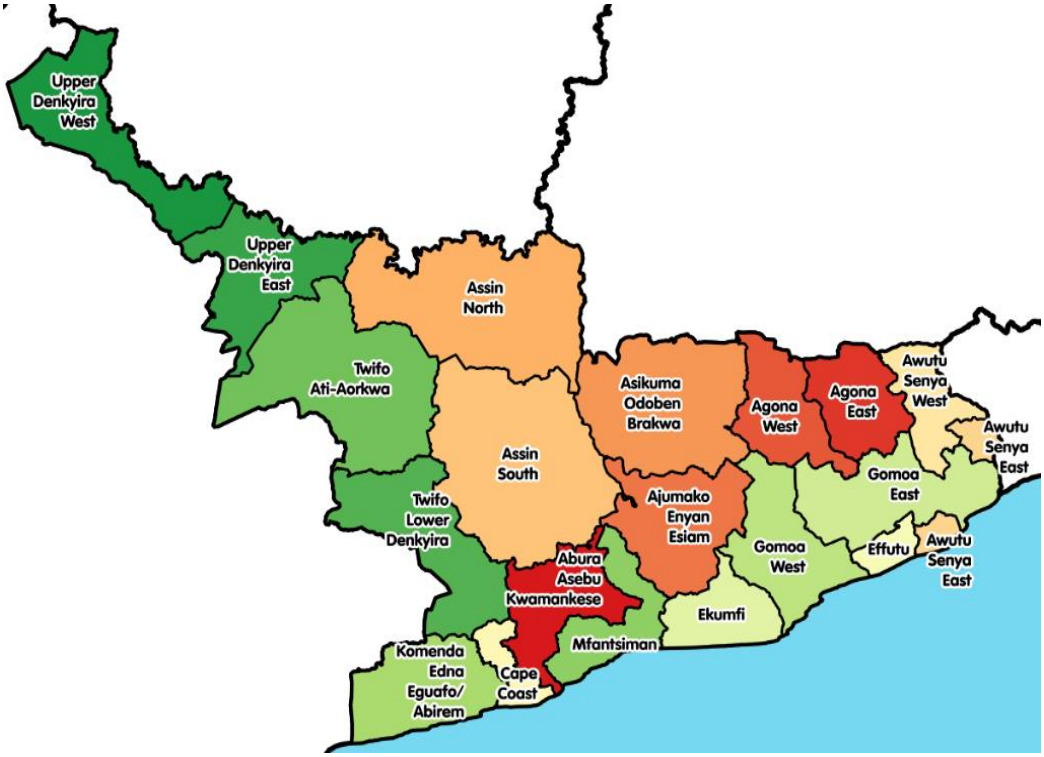


Fig. 1. Map of the Central Region of Ghana, showing the location of Cape Coast and Assin South where participants in the study were recruited. Source: https://www.google.com/search?q=map+of+central+region.

The study areas were Assin South District and Cape Coast Metropolis in the Central Region of Ghana. The Assin South covers a total land area of 1,187 square kilometres and forms approximately 12% of the total land area in the central region. The district lies on latitude 5^0 30" N and on longitude 1^0 2" W. The district shares boundaries with Twifo Atti-Morkwa District on the West, Abura Asebu Kwamankese District on the South, Asikuma Odoben-Brakwa and Ajumako Enyan Essiam on the East and Assin North Municipal on the Northern border (GSS, 2020). Most of the population are actively engaged in agriculture. Data was collected from communities such as; Assin Atobiase, Assin Adiembra and Assin Jakai, Nsuaem-Kyekyewere, Nsuta and Assin Odumase,

The Cape Coast metropolis covers a total land area of 122 square kilometers. It is bounded to the East by Abura – Asebu – Kwamankese District; Komenda – Edina – Eguafo – Abrem (K. E. E. A.) District to the West; the Gulf of Guinea to the South, and Twifo Atti-Morkwa District to the North. The metropolis is positioned on latitudes 50.07' to 50.20' north of the Equator and between longitudes 1˚.11' to 1˚.41' west of the Greenwich Meridian (Cape Coast Metropolitan Assembly, 2023). Majority of the active population is engaged in services (GSS, 2020). In the Cape Coast metropolis, data was collected from communities such as; Ewusikrom, Esuekyir, Kayefi and Nyame Bekyere Zongo, Pedu, Tantri, Idan, Ola Medina and London Bridge.

The justification for the chosen communities in the Assin South district and Cape Coast metropolis is premised on the need for a diverse representation of livestock management practices, meat consumption practices, patterns and preferences, relevance to local agricultural policies, and the feasibility of engaging with farmers effectively. This strategic selection enhanced the study's potential to provide meaningful insights into the dynamics of livestock management and meat consumption within the rural and urban settings in Ghana.

Population

The population of the study were livestock farmers and meat consumers in the catchment areas. The target population were all livestock farmers and meat consumers in Assin South District and Cape Coast Metropolis. The 2010 Population and Housing Census posited 28,058

economically active individuals to be in agriculture whiles in the Cape Coast metropolis about 4,449 economically active individuals were in Agriculture.

According to the 2020 Population and Housing Census, the total population for Assin South is 105,995 made up of 52,083 males and 53,912 females. Similarly, the total population for Cape Coast metropolis is 189,925 made up of 92,790 males and 97,135 females. The total population for these two study areas is 295,920. Details of the population in these two areas are presented in Table 1.

Table 1: Population of study areas

	Assin South	Cape Coast	Total
Male	52,083	92,790	144,873
Female	53,912	97,135	151,047
Total	**105,995**	**189,925**	**295,920**

Source: GSS, 2020

Sample Size and Sampling Procedure

Since it is ordinarily difficult to inspect every individual from the whole population exclusively, a sampling technique was utilized to select samples for the study. The sample size was drawn from the target population. The Target population for individuals who are in Agriculture in the study areas was estimated by the researcher to be 40,000. In view of this, the initial sample size based on Krejcie & Morgan's (1970) sample size determination table was 380. However, a total of 279 respondents were purposively selected from the study areas. This comprised 77 livestock producers/farmers and 202 meat consumers. Out of the 77 livestock farmers, 60 of them were from the Assin South District and 17 were from the Cape Coast Metropolis. Similarly, out of the 202 meat consumers, 70 of them were from the Assin South District

and 132 from the Cape Coast Metropolis. These are respondents who are knowledgeable in the subject matter, available and were willing to participate in the survey. This enabled the researcher to gather the required information to achieve the objectives of the study. Purposive sampling technique was used to select respondents for the study. Purposive sampling is a form of non-probability sampling method, also known as judgmental, selective or subjective sampling. The justification of this technique is premised on the fact that specific and delicate information on livestock production and consumption practices were needed from specific group of people to meet the objectives of this study. Additionally, the purposive sampling technique was used because specific characteristics are of interest to the study.

Data Collection Procedure

Prior to data collection the research instruments (questionnaires) were developed based on a thorough review of existing literature and research objectives. Pilot testing was conducted with a small sample of respondents to refine the questionnaires for clarity and relevance. Respondents were recruited based on the predetermined criteria, ensuring that the sample represented a balanced distribution across the study areas. Informed consent was obtained from each respondent, outlining the purpose of the study, voluntary participation, confidentiality of responses, and the right to withdraw at any time. Researcher visited farms and livestock farmer's workshops, local contacts and veterinary services. Questionnaires were distributed directly to the livestock farmers during the field visits to their farms and homes. The approach allowed for face-to-face interaction, ensuring clarity in

questionnaires comprehension and facilitating immediate clarification of queries by the researcher.

For meat consumers, intercept surveys were conducted at market places, livestock farmers and residential neighbourhoods in the study areas. This method enabled the researcher to reach a diverse cross-section of consumers and gather insight into their preferences, purchasing habits, and perceptions related to meat consumption. Responses were recorded on the questionnaires.

Data Processing and Analysis

Data were first coded into the Statistical Packages for Social Sciences (SPSS) version 23, after which the descriptive statistics of the variables were generated. Data were analysed utilising descriptive statistics. The reason for utilising descriptive statistics was to empower the researcher, to sum up and coordinate information successfully and significantly. The outcomes were presented in tables and followed with commentaries. Frequency counts, and percentages were employed to analyse the respondents' demographic characteristics as well as their responses.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The first section of this chapter presents and discusses the demographic variables of the livestock producers as well as other results from the questionnaire administered to them. The second part presents and discusses the demographic characteristics of meat consumers in addition to the results obtained from the field study.

Response Rate

A total of 77 questionnaires were distributed to the farmers, and all were duly completed and returned to the researcher. Similarly, 202 questionnaires were distributed to the consumers, and all were returned to the researcher. The aforementioned data denotes a 100% rate of response or compliance consistent with that of Abdulai (2022). This rate could be attributed to the fact that the researcher was present with the respondents while answering the questions and retrieved them afterwards.

Table 2: Demographic Characteristics of Livestock Producers

Characteristics	Assin South	Cape Coast	Frequency	Percentage (%)
Gender				
Male	54	16	70	90.91
Female	6	1	7	9.09
Total	**60**	**17**	**77**	**100.0**
Age Category				
Less than 20	1	-	1	1.30
20-30	10	4	14	18.18
31-40	15	5	20	25.97
41-50	24	5	29	37.67
51-60	8	3	11	14.28
Other	2	1	2	2.60
Total	**60**	**17**	**77**	**100.0**
Number of Dependents				
1-2	6	4	10	12.99
3-4	38	7	45	58.44
5-6	14	1	15	19.48
7-8	1	5	6	7.79
9 -10	1	-	1	1.30
Total	**60**	**17**	**77**	**100.0**
Optimal Academic Attainment				
Primary	10	-	10	12.99
JHS	24	-	24	31.17
SHS	20	6	26	33.76
Tertiary	6	11	17	22.08
Total	**60**	**17**	**77**	**100.0**

Source: Field survey, Amoni (2023)

The demographic characteristics of the farmers are presented in Table 2. The findings indicate that out of the 77 livestock farmers, 70 (90.91%) were males, while 7 (9.09%) were females. Thus, more males were into livestock farming than females in both the Assin South District and the Cape Coast

metropolis. This holds true, given the nature of work involved in farming. This agrees to the findings of Osei-Amponsah, and Ahuni (2015) who reported that local pigs in their study areas were mostly owned by men. Livestock farming encompasses feeding, healthcare, breeding and housing which are time-consuming and quite laborious. Further to this, the historical gender roles assigned males with the responsibilities for agricultural work whiles females were assigned with reproductive and house-keeping roles (Doss, 2018).

The age distribution of farmers can best be described as youthful and energetic, and this agrees with the results of Oladeji (2011) who reported that farmers in Oyo State were within the age group of 31 and 50 years. This is because small-scale farming in Ghana is laborious and requires a lot of physical strength. Most of the farming processes are done manually. Moreover, a lot of youthful individuals are venturing into livestock farming as part of their entrepreneurial pursuits. Livestock production is a reliable source of employment, and it is exciting to realize that the youth in the study areas are taking advantage of that to get their daily bread, instead of relying on the central government for jobs.

This finding indicates that majority of the respondents were married and living with their families, which suggests that there could be increased family labor for livestock farming. Such increased labor emanates from the involvement of additional family members in farm activities. In addition, there could be division of labor for livestock farming since the men, their wives, children and other members of the family could offer specialized and individual skills for improved efficiency and productivity in livestock farming.

The study further explored the number of dependants of each farmer interviewed, and the findings are also in Table 2. The findings suggest that a lot of individuals relied economically on the farmers. The reason for this could be that most of these dependants are not economically active. Some of these dependants could be in school or learning other skills. Also, such dependants could be job-seekers who are currently unemployed and therefore the need to be supported. The effect of this finding suggests that, majority of farmers could be financially over-burdened and this may affect their ability to purchase feed, drugs and other essentials for their livestock.

Farmers in the Assin South district had the highest number of dependants ranging from 3 to 6. The farmers in the Cape Coast metropolis had 3 to 4 dependents. The higher number of dependants recorded in the Assin South can be attributable to the agrarian nature of the district. Majority of them are into agriculture unlike the Cape Coast Metropolis where most of the people are into services and commerce, thus, economic activities in the Assin South district are relatively lower compared to the Cape Coast Metropolis.

It is noteworthy that all the respondents demonstrated a minimum and significant level of academic education; all could read and write. This made the collection of data very easy. The Cape Coast metropolis had a good number of farmers who had completed tertiary education. The reason could be due to the establishment of tertiary institutions such as the University of Cape Coast and Cape Coast Technical University in the Cape Coast metropolis. Also, the minimum educational level for farmers in the Cape Coast Metropolis was Senior High School (SHS). Education empowers producers with knowledge on basic good animal husbandry practices (Oladele *et al.*, 2016;

Mwasi *et al.,* 2017). Also, educated farmers by the advent of the internet can research and self-tutor themselves on proper management practices. Additionally, educated livestock farmers understand the nutritional requirements of different livestock species at various production stages (Kasozi & Mugisha, 2013). This knowledge allows them to formulate balanced diets, optimize feed efficiency, and prevent nutritional deficiencies, thereby promoting healthier and more productive animals.

Table 3: Major Species of Livestock Reared by Farmers, and number of years' Experience

Type of livestock	**Assin South**	**Cape Coast**	**Frequency**	**%**
Cattle	4	1	5	6.49
Sheep	9	1	10	12.99
Goat	5	1	6	7.79
Pig	1	1	2	2.60
Chicken	39	13	52	67.53
Rabbit	1	-	1	1.30
Snail	1	-	1	1.30
Total	**60**	**17**	**77**	**100**
Years of Experience				
1-5	7	5	12	15.58
6-10	12	9	21	27.27
11-15	20	3	23	29.57
16-20	16	-	16	20.78
Above 20	5	-	5	6.50
Total	**60**	**17**	**77**	**100.00**

Source: Field survey, Amoni (2023)

The results from Table 3 showed that chicken was the most reared livestock species in the study areas. Chicken was commonly reared in the

study area because it requires less working space compared to cattle, sheep, goat, and pigs. The least reared animal species particularly in Cape Coast Metropolis are cattle, sheep, goat and pigs the reason could be due to urbanization and land use, there is land scarcity and no adequate land for grazing in the Cape Coast Metropolis. For pigs, because of their waste if not disposed well, it will cause stench and a lot of residents might report or fight with the livestock farmers.

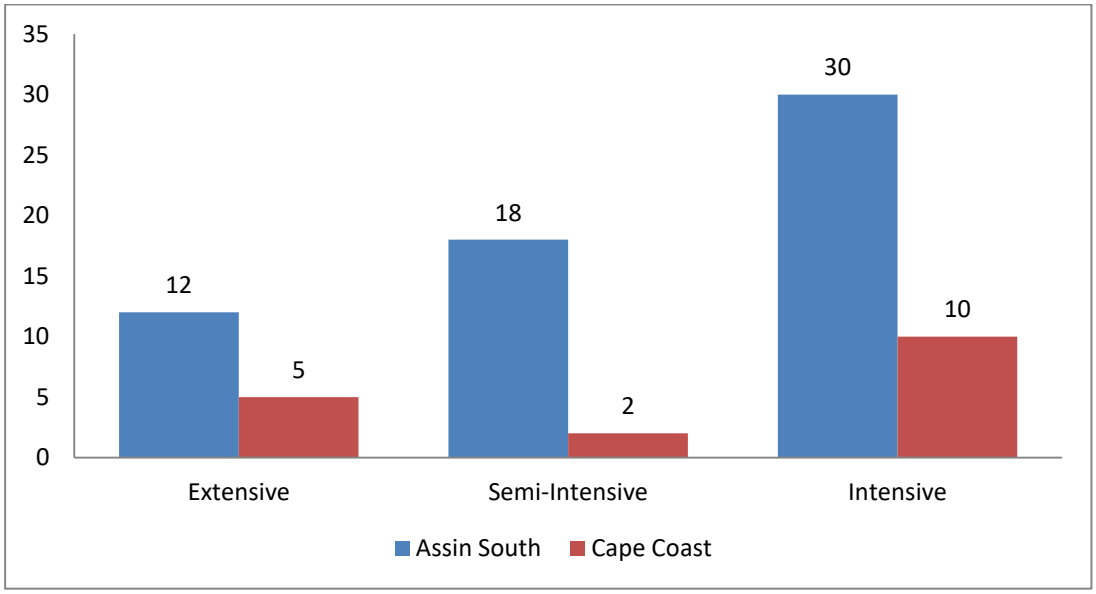
This observation was similar to those reported by Adomako and Ampadu (2016) that livestock such as cattle, sheep and goats were least reared in urban areas due to urbanization and land use. Additionally, Kuusaana *et al.* (2022) reported that an increasing number of urban land parcels are converted for urban infrastructure in Ghana. Chicken rearing is relatively inexpensive and requires less working space compared to sheep, goats, cattle and pigs. Also, there is a fast growth and high productivity for chickens compared to other livestock such as pigs and cattle. Chickens have a relatively shorter growth cycle. Also, chicken is relatively cheaper and more consumed than the other livestock species like the ruminants, pigs, snails, and rabbits. Their eggs are also a valuable source of food (protein) and income generation.

This result corroborates earlier findings by the Ghana Statistical Service (GSS) that posited that chicken is the most predominant livestock reared in the Assin South District and Cape Coast Metropolis of the Central region (GSS, 2010). The study explored farmer's number of years in livestock farming. Farmers in Assin South District had longer farming experience as farming remains one of the major economic activities in the district because of its rural area compared to Cape Coast Metropolis being an urban area. The

results of the table showed that over 55% of the respondents have been raising livestock for 10 years. This distribution suggests that the farmers have been in livestock farming for a considerable number of years, and therefore are knowledgeable to offer insightful responses for the study. Also, farmers in the Assin South District had been in livestock farming for longer periods of about 16 to 20 years, than farmers in the Cape Coast metropolis who have been in farming for a period of about 11 to 15 years. Farmers who have been in the livestock production for a longer period possess a wealth of experiential knowledge about animal behavior, health management, breeding techniques, and environmental factors affecting livestock productivity (Abebe *et al.*, 2017). This deep understanding allows them to make informed decisions and effectively manage their livestock operations. Furthermore, livestock farmers with several years of experience can develop adaptive strategies to cope with challenges such as changing market conditions, climate variability, and emerging diseases (Nath *et al.*, 2016). Their experience enables them to anticipate potential risks, innovate solutions, and adjust their practices to maintain resilience and sustainability in their farming systems.

The lack of diverse economic activities in the Assin South District compel most individuals in rural areas to rely on farming activities for their livelihood, thus livestock farming has been a traditional sustained economic activity over the years in Assin South District. This is in agreement with findings by Osei-Amponsah *et al.,* (2018) who reported farming as a main economic activity for most rural folks in Ghana.

Figure 2: Management systems employed by the livestock farmers



Source: Field survey, Amoni (2023)

The management system employed by livestock farmers in the study areas were enquired, and results presented in Figure 2. Under the intensive management system, livestock, are housed in enclosed facilities that optimize space and resources (Dossa *et al.*, 2015). This system is particularly suitable for urban settings where space is limited, and the potential for livestock to cause disturbances is high.

The semi-intensive management system represents a middle ground between intensive and extensive systems. In this approach, livestock are provided with both indoor management and outdoor access, allowing them to graze or forage while still being sheltered from harsh environmental conditions (Bessei, 2006).

Under the extensive management system livestock are typically allowed to roam freely over larger areas, which is more common among small-scale farmers in rural regions of Ghana. This approach is less intensive and requires less infrastructure investment, making it a viable option for

farmers with limited resources. However, the extensive system presents challenges related to biosecurity and livestock health, as animals may be more exposed to predators and diseases from other animals in the environment (Okere *et al.*, 2011; Rafeeq *et al.*, 2010).

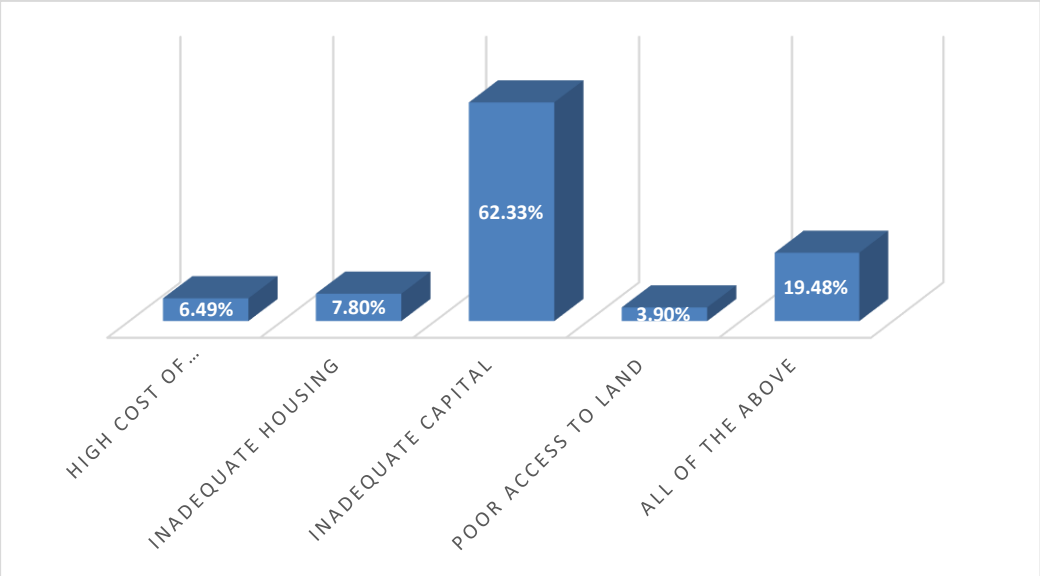
Interestingly, the predominant management system employed by the livestock farmers in the study area was the intensive system (51.95%). This corroborates with the finding of Dossa *et al.*, (2015) and Mwasi *et al.*, (2017) who both reported that the intensive system of management is predominant in urban areas. This result is however inconsistent with findings by Abdulai (2022) who reported that majority of livestock farmers in the Wa metropolis use the semi-intensive management for their livestock. Furthermore, this study's result is inconsistent with that of Nuvey *et al*., (2023) who posited that the extensive system of managing livestock is widely practiced in Ghana by small-scale farmers.

This distribution aligns with the type of livestock reared by farmers in the study area. Since majority of farmers are into rearing of chicken, the intensive and semi-intensive management systems are more suitable. The intensive housing system ensures high efficiency since it involves high stocking densities and controlled environments for the chickens. Further, the intensive managing system ensures biosecurity as exposures to pathogens from external sources are prevented (Xin *et al.*, 2016) since the extensive and semi-intensive systems may be a threat to the productive and reproductive efficiency, safety and health of livestock (Okere *et al.*, 2011; Rafeeq *et al.*, 2010, Hatab *et al.*, 2019). Similarly, the semi-intensive management system of rearing chicken enhances the welfare of the animal since more space and

access to outdoor areas are provided for the chickens. Additionally, the semi-intensive management system reduces feeding cost as the chickens are usually given household remnants to reduce feed cost (Bessei, 2006).

The types of livestock species reared in the study area influences the choice of the managment systems. Since chicken is the predominant livestock species in both the Assin South District and Cape Coast Metropolis, the intensive system is ideal. Also, the urban nature of the Cape Coast metropolis makes the intensive system of housing livestock the preferred choice by farmers. In urban settings, livestock cannot be left roaming as they may cause nuisance and destroy people's properties. Such destruction can lead to conflicts between residence and livestock farmers, thus, more than half of the farmers in Cape Coast use the intensive system of housing livestock.

Figure 3: Challenges faced in housing livestock



Source: Field survey, Amoni (2023)

From Figure 3, farmers were made to identify major challenges pertaining to the housing of their livestock. Farmers were required to choose only one major challenge encountered by them. According to the respondents,

their major challenge was inadequate capital (62.33%) while access to land was the least of their worries. The above distribution suggests that most of the livestock farmers are unable to provide maintenance well-resourced housing system due to financial constraints. Such constraints prevent livestock farmers from embarking on large-scale expansion of their livestock business and could affect output.

It must be emphasized that majority of farmers in the Assin South District do not have the needed capital for maintenance of depilating structures to house their livestock. Access to capital remains a challenge to farmers particularly in rural areas, and as reported by Alene *et al.* (2018), most of the commercial banks are not willing to extend credit facilities to farmers in rural areas. The reason being that most of these farmers are small-scale farmers who may not have the capacity to take bigger loans due to their affordability levels (Akinlo, 2018). Interestingly no farmer in the Assin South district identified "access to land" as a challenge faced in housing livestock, compared to the Cape Coast metropolis where 3 farmers posited "access to land "as their challenge to housing livestock. This result showed that, land is relatively cheaper and more accessible and at lower costs in the Assin South district than the Cape Coast metropolis. The urban nature of the Cape Coast metropolis puts pressure on the existing lands by different users who may be interested in other land use and developments.

Table 4: Effect of management System on Animals

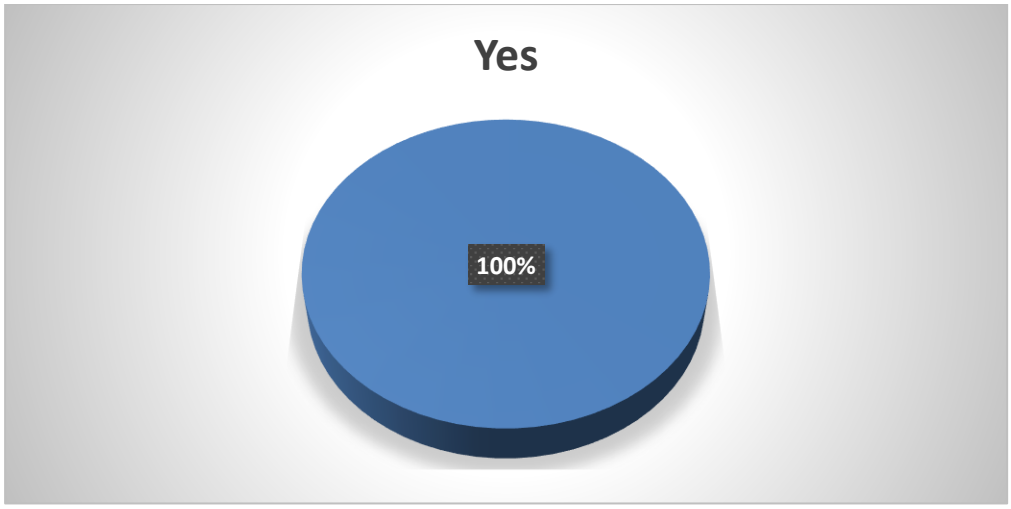
Effect	Assin South	Cape Coast	Frequency	Percentage
High mortality	8	2	10	12.99
Disease outbreak	16	4	20	25.97
Exposure to predators	1	10	11	14.29
No effect	35	1	36	46.75
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

The effect of housing system on animals was explored in this study. From Table 4, most of the farmers (46.75%) reported a non-effect of the housing system on their livestock while about 26% and 13% reported that the type of housing used can lead to disease outbreak and mortality respectively. One can say that because the intensive system of housing livestock is common in the study areas, the animals are well monitored and therefore there are minimal effects of the housing system on them. However, both intensive and semi-intensive housing systems can lead to disease outbreak as most of the animals are always together. It is very easy for a disease to spread from a sick animal to healthy ones. Thus, in intensive housing systems, where animals are kept in close proximity to each other, the risk of disease transmission leading to mortality is heightened due to the high stocking densities and limited space for movement (Mellor, 2016). While intensive systems may facilitate regular monitoring and management practices, such as vaccination programs and early disease detection, the dense population of animals increases the likelihood of disease spread if proper biosecurity measures are not implemented (FAO, 2014). These reasons account for the responses observed.

Comparatively, majority of farmers in the Assin South district do not encounter any effect of the housing system on their livestock. In contrast, majority of farmers in the Cape Coast metropolis identified "exposure to predators" as one of the effects of the intensive housing system on livestock particularly chicken. The reason could be that rodents such as rats and mice may infiltrate small openings under the intensive housing system, and in such cases the chicken would have no room to escape.

Figure 4: Ability to Distinguish between sick and healthy animals



Source: Field survey, Amoni (2023)

From Figure 4, farmers were asked whether they are able to distinguish between sick and healthy animals. All the respondents affirmed that, they can distinguish sick from healthy animals which agrees with the results of Ayim-Akonor (2020) who reported that about 87% of the respondents in their study could identify sick birds from healthy ones. According to Bennett and ljplarr, (2005) the ability to distinguish between a sick and a healthy animal is important as early detection of diseases prevents the spread of the disease from infected animals to healthy ones. Such detection reduced mortality rate of animals, prevent financial losses to livestock farmers and keeps them in

business. It is worthy to note that, when livestock die in masses, the livelihoods of farmers as well as their dependents are negatively affected (Grace *et al*. 2018).

It must be emphasized that all farmers in the Assin South district and Cape Coast metropolis are able to distinguish between sick and healthy animals.

Table 5: Disease diagnosis in livestock

Parameter	Response	Assin South (n)	Cape Coast (n)	Total (n)	Percentage (%)
Signs used to detect ill-health in livestock	Isolation from the flock	12	3	15	19.48
	Change in faecal colour, texture and smell	4	5	9	11.69
	Excessive Panting	4	3	7	9.09
	Rough wool	9	1	10	12.99
	All of the above	25	4	29	37.66
	Others	6	1	7	9.09
Techniques used in diagnosing diseases	Palpation	9	2	11	14.29
	Visual appraisal	51	15	66	85.71
Practice of ante-mortem and post-mortem during slaughter	No	60	17	77	100
Encountered any disease outbreak in the year 2023	Yes	57	5	62	80.42
	No	3	12	15	19.48

Source: Field survey, Amoni (2023) n=number of respondents

Respondents were asked the signs they use to differentiate sick animals from healthy ones. From Table 5, all the respondents were able to use various signs and symptoms to differentiate a sick from a healthy animal. Isolation from an animal from the flock (19.48%) was the most obvious sign of ill health farmers used to assess the health status of their animals. The above distribution shows that, sick animals may exhibit one or more of the afore-mentioned signs when they are sick. Such signs give a clue to livestock farmers on how to know the difference between sick and healthy animals.

Changes in fecal characteristics, such as color, texture, and smell, can also provide valuable diagnostic information about the health status of animals. Such changes in fecal parameters may indicate underlying gastrointestinal disorders, parasitic infections, or metabolic imbalances (Radostits *et al.,* 2007). By closely monitoring fecal output and appearance, farmers can detect early signs of digestive disturbances and initiate appropriate interventions, such as deworming or dietary adjustments. Similarly, observable signs of respiratory distress, such as panting or labored breathing, may indicate respiratory infections or heat stress in livestock (Stott *et al.,* 2010). Prompt recognition of respiratory symptoms allows farmers to implement measures to alleviate stress, improve ventilation, and prevent the spread of infectious agents within the herd or flock.

This result supports findings by Nuvey *et al*., (2023) who observed that most livestock in the Mion, Pru East and Kwahu Afram Plains South districts in Ghana that were sick exhibited breathing difficulties (excessive panting) when they contracted diseases such as contagious bovine pleuropneumonia. It must be emphasized that these methods are good but not scientific. Similarly,

such methods of detecting sick animals are not effective since a change in fecal color, texture or smell may be due to the feed given to the livestock.

The study explored the techniques used by livestock farmers to diagnose diseases amongst their livestock, and the findings are displayed in Table 5. As expected, visual appraisal was identified by majority (85.71%) of the respondents as the common techniques used by them to diagnose diseases. Only 14.29% of the respondents indicated palpation as techniques they used to diagnose diseases amongst their livestock. The outcome of this study is not surprising since visual appraisal is based on observation and the experience of the livestock farmer, and does not require the use of sophisticated tools.

The reliance on visual appraisal as a primary diagnostic tool reflects the practical realities of livestock farming in Ghana, where access to veterinary services and diagnostic laboratories may be limited, particularly in remote or underserved areas (Tambi *et al.,* 2018). Furthermore, visual appraisal aligns with traditional knowledge systems and cultural practices among livestock-keeping communities, reinforcing its widespread acceptance and adoption (Adedokun *et al.,* 2018).

By far, the visual appraisal is the widely used technique to diagnose diseases by most livestock farmers in Ghana. This result supports findings by Theurer *et al.,* (2013) who affirmed visual appraisal as the most common and conventional technique used to detect wellness or pains associated with livestock, particularly cattle in North America.

The study explored whether farmers practiced ante-mortem and post-mortem inspections before and after slaughter of their animals. From Table 5, all the respondents in the study areas indicated they do not practice ante-

mortem and post-mortem inspections during slaughter of their animals. It must be stressed that ante-mortem and post-mortem inspections are carried out by certified veterinary officers. The distribution suggests that livestock farmers do not engage these professionals when they want to slaughter their animals. Such farmers may want to avoid incurring transportation and processing charges at abattoirs hence their decision to self-slaughter animals at home. However, this can lead to serious health implications when infected meat is sold and consumed by the public. The involvement of certified veterinary officers in conducting ante-mortem and post-mortem examinations is essential to identify and mitigate potential health risks associated with the slaughter and processing of animals (Food and Agriculture Organization, 2019). Veterinary professionals possess the necessary training, expertise, and diagnostic tools to detect infectious diseases, parasitic infestations, and other health conditions that may render meat unfit for human consumption.

From Table 5, majority (80.52%) of the farmers intimated they encountered disease outbreak amongst their livestock in the previous year (2023). However, 19.48% indicated not encountering any disease outbreak in the year 2023. This could have resulted in the death of some of the livestock and consequently a reduction in livestock output for the year. The year 2023 was used as a reference year because the author wanted to explore current state of disease outbreak amongst livestock in the study areas as well as types of disease outbreaks. This enabled the capturing of recent trends, patterns, and dynamics in livestock health and disease prevalence without relying on older data that may not reflect current conditions in the study area.

The high prevalence of diseases among livestock can have detrimental effects on livestock health, productivity, and overall agricultural output. Disease outbreaks can lead to increased mortality rates among animals, reduced growth rates, decreased reproductive performance, and lower milk or meat yields (Mariner *et al.*, 2016). Additionally, disease outbreaks can result in financial losses for farmers due to the cost of veterinary treatments, decreased market value of affected animals, and potential disruptions to livestock production activities (Muma *et al.*, 2012).

Comparatively, majority of farmers in the Assin South district encountered disease outbreak in the year 2023 compared to farmers in the Cape Coast Metropolis. Farmers in Cape Coast however had not encountered any major disease outbreak in recent times. This could be attributed to the fact that those farmers are more educated and may have adequate knowledge on good health management of livestock. Also, the presence of the veterinary service in the municipality is an added advantage since they could secure the services of the officers with ease. Additionally, farmers in the area mostly practice the intensive housing system which could be a way to help manage the occurrence of disease outbreaks.

Table 6: Dealing with disease outbreak

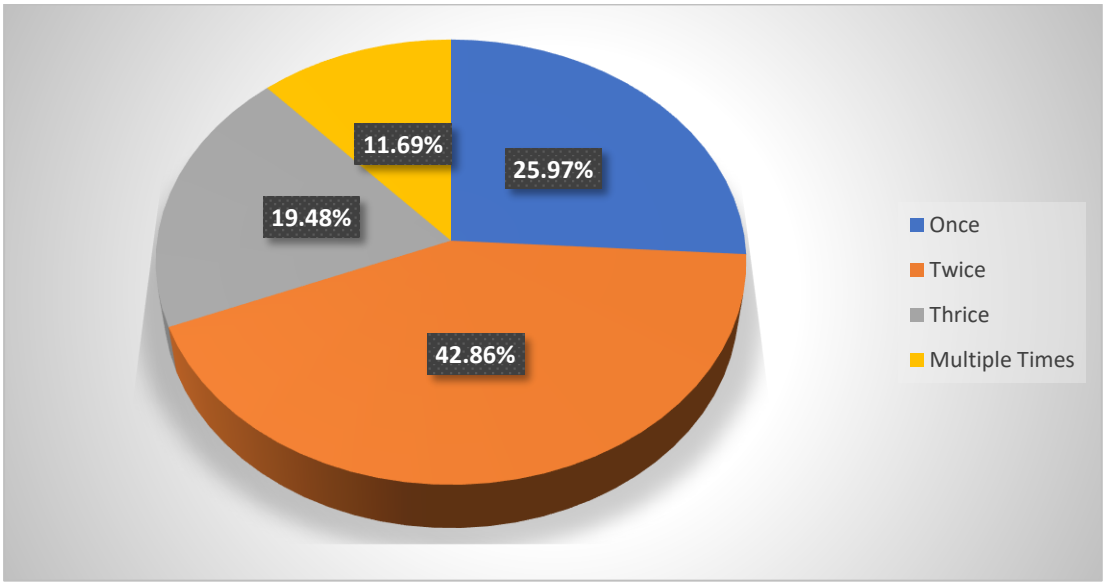
Response	Assin South	Cape Coast	Frequency	Percentage
I report it to the veterinary agent	2	3	5	6.4
I sell all the animals	15	5	20	25.97
I slaughter affected animals for meat	6	1	7	9.10
I administer drug	36	9	45	58.44
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

From Table 6, about 58% of the livestock farmers administer drugs to their sick animals in order to curb disease outbreak. This agrees with Van Boeckel *et al.,* (2015) who stated that, in an effort to mitigate these losses, farmers may resort to administering drugs to sick animals without proper veterinary oversight. Again, Nuvey *et al.* (2020) stated that due to the inadequate service delivery by the veterinary services, service resort to buying drugs from unlicensed dealers and self-treat their diseased cattle agreeing to the findings of this study. Livestock farmers often face economic pressures when their animals fall ill, as disease outbreaks can result in financial losses due to reduced productivity and potential mortality.

Similarly, most livestock farmers are willing to sell their sick animals to the public to avoid any financial loss. It is worthy to note that selling of sick animals to the public can be detrimental to their health particularly when such meat is not cooked well and consumed by unsuspecting public. The sale of sick animals for human consumption poses serious health risks, as meat from diseased animals may contain harmful pathogens or residues of veterinary drugs (Kassa *et al.,* 2018). Consuming such meat, can lead to foodborne illnesses and the transmission of zoonotic diseases to unsuspecting consumers. Furthermore, such acts (selling of sick animals) by livestock farmers contravene the stipulations in the Diseases of Animals Act, 1961 (Act 83). Section 5 of Act 83 states that "*No person shall without the permission of a veterinary authority disperse or dispose of, whether by sale or otherwise, send away any animals, or the carcass or flesh or other part of any animals, which have been in contact with animals referred to in section 3 of this Act*".

Figure 5: Frequency of disease outbreak per year



Source: Field survey, Amoni (2023)

Figure 5 depicts the frequency of disease outbreak encountered by farmers. The results show that, disease outbreaks are a recurrent issue for livestock farmers in the study area, with majority of the farmers (42.86%) experiencing at least two occurrences within a single year. In agreement, Grace *et al.* (2015) mentioned that, the repeated nature of these outbreaks underscores the persistent threats posed by infectious diseases, environmental stressors, and other factors that can compromise animal health and productivity.

The high frequency of disease outbreaks reported by farmers may be attributed to various factors, including inadequate biosecurity measures, limited access to veterinary services, and suboptimal management practices (Nath *et al.*, 2016).

Table 7: Prevalent Livestock diseases in the study areas

Disease	Assin South	Cape Coast	Frequency	Percentage
African swine fever	10	1	11	14
Foot and mouth	2	1	3	3.90
Coccidiosis in Poultry	8	2	10	12.99
Newcastle	38	10	50	64.93
PPR	1	1	2	2.59
Others	1	-	1	1.30
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

The study explored the prevalent livestock diseases in the study areas. In conformity to the type of common livestock reared, majority (64.93%) of the respondents mentioned Newcastle disease as the most prevalent in the study areas. Given that most of the farmers were into rearing of chicken, the prevalence of Newcastle disease is not surprising. The Newcastle disease mainly affects birds particularly chicken (Dimitrov *et al.,* 2019). Some of the symptoms of Newcastle disease include but not limited to coughing, watery eyes and persistent diarrhea. This result is consistent with a study by Amoia *et al.*, (2021) who found that Newcastle disease is prevalent among poultry farmers in Côte d'Ivoire. The authors further found that the Newcastle disease has caused a lot of bird mortality in some parts of Africa. The high prevalence of Newcastle disease underscores the significant impact it can have on poultry production, including high mortality rates, reduced egg production, and economic losses for farmers.

Table 8: Challenges faced in terms of diseases on the farm

Response	Assin South	Cape Coast	Freq.	Percentage
Control spread of diseases	47	13	60	77.92
High Cost of Medication	1	1	2	2.59
Access to Vaccines	2	1	3	3.90
Health identification	4	1	5	6.49
Access to veterinary drugs	1	-	1	1.30
Drug administration	1	-	1	1.30
Access to disease resistant	4	1	5	6.50
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

From Table 8, disease control (77.92%) is by far the most challenging endeavor by livestock farmers. This challenge, as said by Nath *et al.* (2016) could lead to high mortality rate and loss of livestock. The economic consequences of disease outbreaks extend beyond immediate losses from mortality and reduced productivity to encompass additional expenses associated with veterinary treatments, disease control measures, and replacement of lost livestock (Nath *et al.*, 2016). In resource-constrained settings, such as smallholder farming communities, the financial burden of disease management can exacerbate poverty and food insecurity, undermining the livelihoods and well-being of farmers and their families (FAO, 2016).

It must be emphasized that, the outbreak of disease is inevitable and can occur anytime, making it more challenging. On the whole, both farmers in the Assin South district and Cape Coast Metropolis have difficulties in controlling diseases on their farms. Livestock diseases can be caused by a

wide range of infectious agents, including viruses, bacteria, parasites, and fungi. Each type of pathogen may have unique characteristics, transmission routes, and control strategies, making it difficult for farmers to effectively control diseases on their farms.

Table 9: Source of Information on Livestock Production

Response	Assin South	Cape Coast	Frequency	Percentage
Extension agents	5	2	7	9.09
Colleague farmers	36	4	40	51.95
Media	12	8	20	25.97
Veterinary personnel	7	3	10	12.99
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

Information on livestock production is important. Such information guides farmers on best practices and ways of improving their livestock business. In view of this, the study explored the sources where livestock farmers obtain information on livestock production. Majority (51.95%) of the farmers mentioned their colleague farmers as their source of information on livestock production, while they ironically mentioned extension agents as their least (9.09%) source of information on livestock production in the study areas. The results of the study in consonance with Oladeji (2011) who also reported that only a small percentage of farmers received information from extension agent. According to research, the farmers got most of their information from the media and family and friends (Oladeji, 2011) which also agrees to the findings of this study. This result shows that livestock farmers are willing to practice what their colleague farmers engage in when it comes to livestock

production. Also, the report of this study agrees with Folitse *et al.* (2018) who also mentioned that family and friends were the most common source of information to farmers. Thus, most of their livestock activities are influenced by the information they obtain from their peers (Chagunda *et al.*, 2018).

From the result, few livestock farmers indicated obtaining information from veterinary personnel and extension agents. This could be attributable to the cost involved in seeking the services of some of these professionals, particularly veterinary personnel. Also, there are generally limited numbers of veterinary personnel and extension agents in the country. The low patronage of veterinary personnel and extension agents by farmers can affect their livestock productivity (Alders *et al.*, 2018). This happens when such farmers have limited information on livestock management and also lack the capacity to control diseases amongst their livestock.

Table 10: Type of veterinary personnel available to farmers

Type	Assin South	Cape Coast	Frequency	Percentage
Veterinary surgeon	1	6	7	9.09
Veterinary technician	58	10	68	88.31
Both	1	1	2	2.60
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

The type of veterinary personnel available to farmers was explored in this study. From table 10, majority (88.31%) of the farmers reiterated having access to veterinary technician while only 9.09% indicated having access to veterinary surgeons and 2.60% mentioned having access to both the services of veterinary surgeon and veterinary technician in their various communities.

This reluctance to engage veterinary professionals regularly may be attributed to various factors, including perceived costs associated with veterinary consultations, treatments, and other services (FAO, 2016). In resource-constrained settings, such as rural farming communities, farmers may prioritize other expenses over veterinary services, particularly if they perceive their livestock to be relatively healthy or if they lack awareness of the benefits of regular veterinary care (Adegbola *et al.*, 2019).

The occasional utilization of veterinary services by farmers may also reflect challenges in accessing veterinary clinics or facilities, logistical barriers in transportation, and limited availability of veterinary medications and supplies (Ndambi *et al.*, 2018). Moreover, cultural and traditional beliefs regarding animal health and healing practices may influence farmers' perceptions of veterinary care and their willingness to engage with veterinary professionals (Chagunda *et al.*, 2018).

Majority of farmers in the Assin South district and the Cape Coast metropolis have access to veterinary technician. However, more farmers in the Cape Coast metropolis have access to veterinary surgeons than farmers in the Assin South district. The reason could be that the Cape Coast metropolis have better infrastructure, including veterinary clinics, diagnostic laboratories, and animal health centers, which provide facilities for veterinary surgeons to offer a wide range of services to farmers. However, the Assin South district have limited veterinary infrastructure and resources, making it more challenging for veterinary surgeons to provide comprehensive services.

Table 11: Affordability of veterinary services

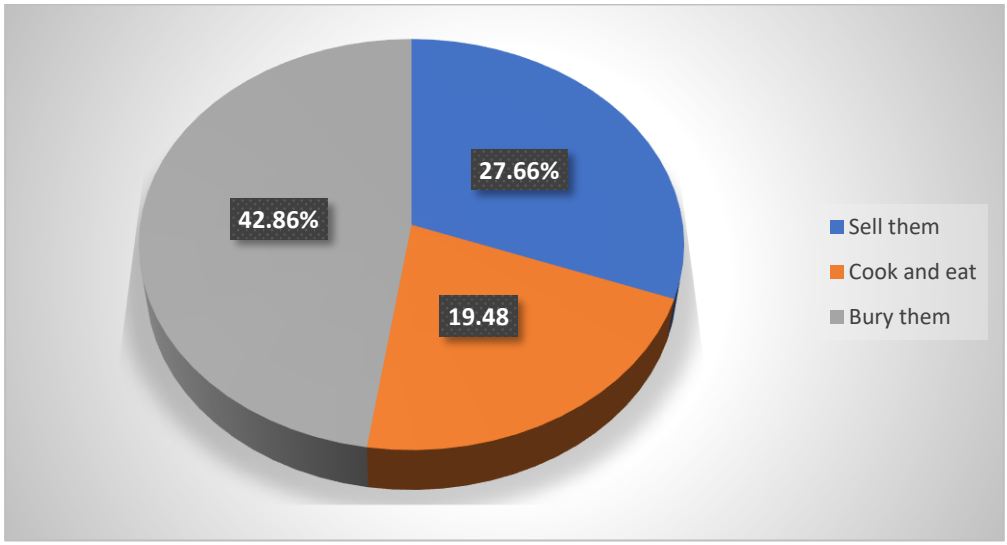
Response	Assin South	Cape Coast	Frequency	Percentage
Affordable	48	12	60	77.92
Expensive	12	5	17	22.08
Total	**60**	**17**	**77**	**100**

Source: Field survey, Amoni (2023)

Respondents were asked the affordability of the veterinary services. Majority (77.92%) of them indicated that the price charged by veterinary professionals were affordable. However, 22.08% indicated that the price they pay for veterinary services was expensive. When probed to find out the charges they pay when veterinary personnel visit their farm, the highest amount mentioned was GHS 300 whiles the least amount mentioned was 20 GHS. Some of the respondents also mentioned that the amount they pay depends on the scope of work performed by the veterinary personnel. According to Adzitey (2013), veterinary services in Ghana are generally considered as expensive by livestock farmers which is inconsistent with the findings of this results.

The affordability of veterinary services is a critical factor influencing farmers' decision-making processes regarding the use of veterinary care and the frequency of engagement with veterinary professionals (FAO, 2016). High costs associated with veterinary consultations, treatments, and medications may deter farmers from seeking timely veterinary assistance, leading to delays in disease management and compromised animal health outcomes (Grace *et al.*, 2018).

Figure 6: Disposal of Carcass



Source: Field survey, Amoni (2023)

The study explored how livestock farmers in the study areas dispose carcasses of dead animals. Majority (42.86%) of them indicated burying the carcass while a considerable number 19.48% indicated they cook and eat the carcasses when they think it did not die of serious disease. For those who sell them (27.66%), they argued that the meat will go waste and therefore there is the need to make some money out of it which is consistent with the report of Nuvey et al. (2020) who found out from their research that some livestock farmers sell their diseased cattle for meat as a means to recover losses is one of the adaptive strategies adopted to cope with the adverse event they suffer. In respect of those who said they bury them health reasons were cited. Finally, for those who said they cook the carcass, some argued that the diseases are not zoonotic and will not be affected when consumed. Interestingly, one farmer mentioned that when the meat is cooked and eaten by them, it reduces the cost that they would have incurred in purchasing meat for home consumption. It is worthy to note that livestock can die either through diseases or natural

disasters. Thus, apart from diseases, there are so many things that could result in death of animals.

The result showed that majority of farmers bury the carcass as a way of disposing them. This result is consistent with findings by Onyimonyi et al., (2013) who found out that carcasses are buried or burnt in Nigeria as a way of disposing them. Despite this being widely practiced in Nigeria, the authors added that some improper ways of disposal such as selling of dead/dying animals do occur in Nigeria (Onyimonyi et al., 2013; FAO 1998). Such selling of dead animals could be detrimental to the health of consumers.

Majority of farmers in the Assin South district sell the carcass of dead animals as a way of disposal whiles majority of farmers in the Cape Coast bury the animal carcass. Interestingly, a minority of farmers in both Assin South district and the Cape Coast metropolis cook and eat the animal carcass for food.

Table 12: Demographic Characteristics of Meat Consumers

Characteristics	Assin South	Cape Coast	Freq.	Percentage (%)
Gender				
Male	10	42	52	25.70
Female	60	110	150	74.30
Total	**70**	**132**	**202**	**100.0**
Age Category				
Less than 20	5	8	13	6.43
20-30	18	42	60	29.70
31-40	25	49	74	36.63
41-50	10	30	40	19.80
51-60	2	8	10	4.95
Other	3	2	5	2.49
Total	**70**	**132**	**202**	**100.0**
Marital Status				
Marital Status				
Single	10	15	25	12.38
Married	35	80	115	56.93
Divorced	5	13	18	8.91
Separated	16	14	30	14.85
Widowed/Widower	4	10	14.0	6.93
Total	**70**	**132**	**202**	**100**
Dependents				
1-2	23	42	65	32.18
3-4	35	55	90	44.55
5-6	7	15	22	10.90
7-8	3	11	14	6.93
9 -10	2	9	11	5.44
Total	**70**	**132**	**202**	**100.0**

Source: Field Survey, Amoni, (2023)

Table 12 reveals that out of the 202 meat consumers, 150 (74.3%) were females, while 52 (25.7%) were males. Thus, there are more female meat

consumers in the Assin South district and Cape Coast metropolis than males. In agreement to the results of this study, Teye *et al.,* (2020) reported that the higher number of females is because most females are the ones who usually purchase meat from the market compared to males.

The number of meat consumers who fall within the age category of 31 to 40 were many in both districts. Both districts had consumers who can be classified as youthful. However, the number of meat consumers who fall within the age category of 51 to 60 were many in the Cape Coast metropolis than the Assin South district. It can be inferred that, most of the meat consumers can be classified as youth and middle age. Therefore, changes in consumption patterns among these age groups can influence market dynamics, agricultural production systems, and the livelihoods of farmers and producers. Furthermore, these categories of people are actively engaged in preparation of food and consumption of meat. Thus, there is a ready market for livestock products in the study areas.

In terms of marital status, the distribution shows that majority of the study's participants were married. The implication for this study is that married individuals, especially those with children, may tend to consume more meat than single individuals or couples without children due to the larger household size and dietary needs of family members. Also, married couples may be more likely to cook meals at home, which can lead to increased meat consumption as it's a common ingredient in many dishes. Conversely, single individuals or those in relationships without children may opt for simpler or smaller meals that include less meat.

Consumers with more dependents suggest a higher overall meat consumption. This is often due to the increased food needs of a larger family and the desire to provide sufficient nutrition for all household members. Also, larger families with more dependents may have lower disposable income per capita, potentially impacting their ability to afford meat on a regular basis. Comparatively, consumers in the Cape Coast metropolis had more dependents than those in the Assin South district.

Table 13: Other Demographic Characteristics of Meat Consumers

Characteristics	Assin South	Cape Coast	Freq.	Percentage (%)
Religion				
Christianity	45	112	157	77.72
Muslim	18	17	35	17.33
Traditionalist	6	2	8	3.96
Others	1	1	2	0.99
Total	**70**	**132**	**202**	**100.0**
Occupation				
Unemployed	10	5	15	7.43
Public servant	15	32	47	23.27
Civil servant	14	41	55	27.23
Trader	24	50	74	36.63
Farmer	7	4	11	5.44
Educational Status				
Primary	8	3	11	5.44
Secondary	34	28	62	30.70
Tertiary	28	101	129	63.86
Total	**70**	**132**	**202**	**100.00**

Source: Field Survey, Amoni, (2023)

From Table 13, the religious background of respondents connotes a Christian dominance in the study areas. Overall, religion can play a significant role in shaping attitudes and behaviors related to meat consumption, with dietary practices varying widely among different religious communities and individual adherents (Bekkali *et al.*, 2017; Cobb *et al.*, 2016). In Islam, adherence to halal dietary laws influences meat consumption practices, with requirements for animals to be slaughtered in specific ways and certain meats, such as pork, being prohibited (Bekkali *et al.*, 2017). Similarly, in Hinduism, the reverence for cows as sacred animals leads to the avoidance of beef consumption among many adherents (Cobb *et al.*, 2016).

This distribution suggests that majority of respondents are engaged in an economic activity and receiving income or revenue regularly, thus they are in a position to purchase meat when they need it.

Comparatively, consumers who are traders dominate in both the Assin south district and the Cape Coast metropolis. This is followed by consumers who are civil servant and public servant. However, the number of consumers who are unemployed are many in the Assin South district than the Cape Coast Metropolis. Similarly, consumers who are farmers are many in the Assin South district compared to the Cape Coast metropolis.

Table 14: Frequency of Meat Consumption

Response	Assin South	Cape Coast	Frequency	Percentage
Daily	25	60	85	42.07
Once a week (Apart from weekends)	4	22	26	12.89
Weekends	29	40	69	34.15
Occasionally	12	10	22	10.89
Total	**70**	**132**	**202**	**100**

Source: Field survey, Amoni (2023)

The study explored the frequency of meat consumption in the study areas. Majority (42.07%) of the respondents consume meat on a daily basis, where as 10.89% of respondents consume meat occasionally. The results of the study disagree with the earlier findings of Osei-Asare and Eghan (2014) who reported that only 8.5% of their respondents used meat in their daily menu. It results however agrees with Osei-Asare and Eghan (2014) who again reported that only a small percentage (9%) of the respondents in their study area used meat irregularly in their diet. This difference could be attributed to the fact that both researches were carried out in different study areas with differences in the demographics of the respondents.

This result shows that meat is frequently consumed by individuals in Assin South and Cape Coast metropolis. This suggests that the demand for meat could be high in these areas. The reason for the high consumption of meat could be availability and accessibility. Where meat is readily available and affordable, people may consume it more frequently simply because it is easily accessible. Accessibility refers to the ease with which consumers can obtain meat products from local markets, grocery stores, butcher shops, or informal vendors (Chagunda *et al.,* 2018). In areas where meat is readily available and accessible, consumers may be more inclined to include meat in their meals as a convenient source of protein and essential nutrients (Smith *et al.,* 2019; Wang *et al.,* 2018; Ndambi *et al.,* 2018). The proximity of livestock farms or processing facilities to urban centers and rural communities also facilitates the distribution and retailing of meat products, ensuring regular supplies to meet consumer demand (Adegbola *et al.,* 2019).

Table 15: Choice of major meat

Response	Assin South	Cape Coast	Frequency	Percentage
Beef	15	68	83	41.09
Chicken	25	32	57	28.22
Bush meat	18	5	23	11.40
Pork	7	10	17	8.40
Mutton	2	10	12	5.94
Chevon	3	7	10	4.95
Total	**70**	**132**	**202**	**100**

Source: Field survey, Amoni (2023)

As meat is consumed on a daily basis in the study areas, the researcher sought to find out the most preferred meat in the study areas. The results from table 15 revealed that beef was the major choice of meat amongst consumers in the Cape Coast metropolis. This agrees with the report of Mahaboubil-Haq and Adzitey (2016) who reported beef as the choicest meat in their study and attributed it to its availability and lower price. However, Nkegbe *et al*. (2013) argued that in their study, chicken was found to be predominant meat among households. Furthermore, studies by Grace *et al.*, (2018) posit chicken as a popular meat choice due to relatively lower fat content compared to red meats like beef and pork. The choice for beef as the most preferred meat by respondents can be attributable to its availability and affordability in the Cape Coast metropolis. However, chicken was ranked second by respondents because it is relatively cheaper than other types of meat such as beef, mutton and chevon. More so, poultry farming is also widespread in many regions, making chicken readily available in local markets and households (Chagunda *et al.*, 2018). Additionally, chicken is versatile and can be prepared in various ways, appealing to a wide range of consumers (Adegbola *et al.*, 2019; Amanor-Boadu *et al*.,2016). This may account for its second ranked choice by consumers in the study areas.

Comparatively, consumers in the Assin South District prefer chicken followed by beef as their choice of meat. The reason could be that, chicken is more available than beef in the Assin South district due to the fact that there is no slaughter facility in the district therefore limits beef availability. However, consumers in the Cape Coast metropolis prefer beef followed by chicken as their choice of meat. The reason could be that, they can easily afford beef. Moreover, beef is widely available for purchases in urban settings compared to rural settings. Similarly, consumers in the Assin South district consume game meat (venison) than consumers in the Cape Coast metropolis. The reason could be that, the Assin South district have more vegetative covers (bushes and forests) than the Cape Coast metropolis which is urban in nature. Most of the land use in Cape Coast is for constructional purposes and development than the Assin South district. Mutton is the least consumed meat in the Assin South district whiles bush meat is the least consumed meat in the Cape Coast metropolis.

Table 16: Type of Meat and their Sources obtained by Consumers

Response	Assin South	Cape Coast	Freq.	Percentage
Cold stores *(Chicken)*	17	40	57	28.21
Open markets *(Beef)*	15	10	25	12.39
Supermarkets *(Chicken)*	4	12	16	7.92
Butcher shops *(Mutton & Chevon)*	9	63	72	35.64
Self-slaughter *(Chicken, Mutton & Pork)*	25	7	32	15.84
Total	**70**	**132**	**202**	**100**

Source: Field survey, Amoni (2023)

The result from the table suggests that most people (35.64%) want fresh meat and there has been a notion that meat from the butcher's shop/abattoir are mostly fresh. Additionally, butcher shops may adhere to

regulatory standards for meat handling, hygiene, and sanitation, instilling confidence in consumers regarding food safety (Ndambi *et al.,* 2018). This accounts for its high purchasing source by consumers. This report agrees with Mahaboubil-Haq and Adzitey (2016) who reported a 60% purchase of meat from butcher shops. However, Nkegbe et al. (2013) had a contrary report that most (39%) of the consumers in their study area purchased meat from the cold stores.

Nkegbe et al. (2013) reported that only a few people purchased meat from the supermarket which agrees to the finding in this study (7.92%), however, disagreeing with Mahaboubil-Haq and Adzitey (2016) who reported that 33.8% of consumers purchased meat from the supermarket which could be attributed to the hygiene of the meat.

From the study, a considerable number of consumers preferred to buy from the cold stores because they believe the meat are well preserved through deep freezing. For consumers who like to self-slaughter, they may have some reservations on how meat is handled by butchers or slaughter men. Furthermore, such consumers may want to avoid the act of buying dressed animals who may have been infected by a disease, hence their decision to self-slaughter the animals for consumption. It must be emphasized that most consumers self-slaughter animals at home for private consumption in Ghana although it is illegal. It must be emphasized that chicken, sheep, pig, cattle were the commonest type of meat that were self-slaughtered by consumers (traders and farmers) in the study areas. In terms of individuals who prefer to buy from open market, availability and price may be the determining factor.

Comparatively, majority of consumers in the Assin South district get their meat through self-slaughter of animals whiles majority of consumers in the Cape Coast metropolis buy their meat from butcher shops. The existence of slaughter facility in the Cape Coast metropolis accounts for this. There is no such facility in the Assin South district. What pertains in the Assin South district is small or way side butcher shops. The prevalence of small or wayside butcher shops in the Assin South district reflects a reliance on informal meat supply chains and small-scale enterprises for meat procurement. While this may provide livelihood opportunities for local entrepreneurs, it may also present challenges in terms of quality control, standardization, and consumer confidence compared to formal meat establishments.

Table 17: Factors that influence consumers' choice of meat purchased

Response	Assin South	Cape Coast	Freq.	Percentage
Price of the meat	35	75	110	54.45
Wholesomeness of the meat	20	28	48	23.76
Neatness of the dispensing environment	10	15	25	12.39
Packaging	3	9	12	5.94
Availability	2	5	7	3.46
Total	**70**	**132**	**202**	**100**

Source: Field survey, Amoni (2023)

The factors that influence consumers to purchase meat were assessed in this study. The result in table 17 shows that majority (54.45%) of the respondents purchase meat based on their prices. The report agrees with Ndambi *et al.* (2018) who stated that consumers often seek affordable options that offer value for money, and fluctuations in meat prices may influence purchasing decisions. Price sensitivity is common among consumers, particularly in low-

and middle-income settings, where budget constraints may limit purchasing power (Adegbola *et al.,* 2019).

Table 18: Purchase and Consumption of Meat

Parameter	Response	Assin South (n)	Cape Coast (n)	Total (n)	Percentage (%)
Readiness to pay for high quality meat	Yes	68	130	198	98.02
	No	2	2	4	1.98
Slaughter of sick animals for meat	Yes	39	52	91	45.05
	No	31	80	111	54.95
Dress dead animals for meat	Yes	16	22	38	18.82
	No	54	110	164	81.18

Source: Field survey, Amoni (2023) n=number of respondents

From Table 18, consumers were asked whether they will pay higher amounts for high quality meat. According to Geletu *et al.,* (2021:1), quality meat can be defined "instrumentally including composition, nutrients, color, water-holding capacity, tenderness, functionality, flavors, spoilage, and contamination". Majority (98.02%) of the respondents affirmed that they are ready to pay extra for high quality meat whiles only 1.98% of them were not willing to pay more for high quality meat. Adegbola *et al.,* (2019) whose research evidence suggests that consumers are willing to pay a premium for high-quality meat products due to their perceived value and positive sensory experiences agrees with the results of the current study. Quality-conscious consumers may actively seek out reputable suppliers, brands, or labels that signify superior quality, demonstrating a willingness to invest in premium products that meet their expectations (Chagunda *et al.,* 2018). Consumers associate quality with various attributes such as freshness, tenderness, flavor, nutritional value, and safety (Grace *et al.,* 2018). High-quality meat is often

perceived as superior in taste, texture, and overall satisfaction, leading consumers to prioritize quality over price considerations (FAO, 2016).

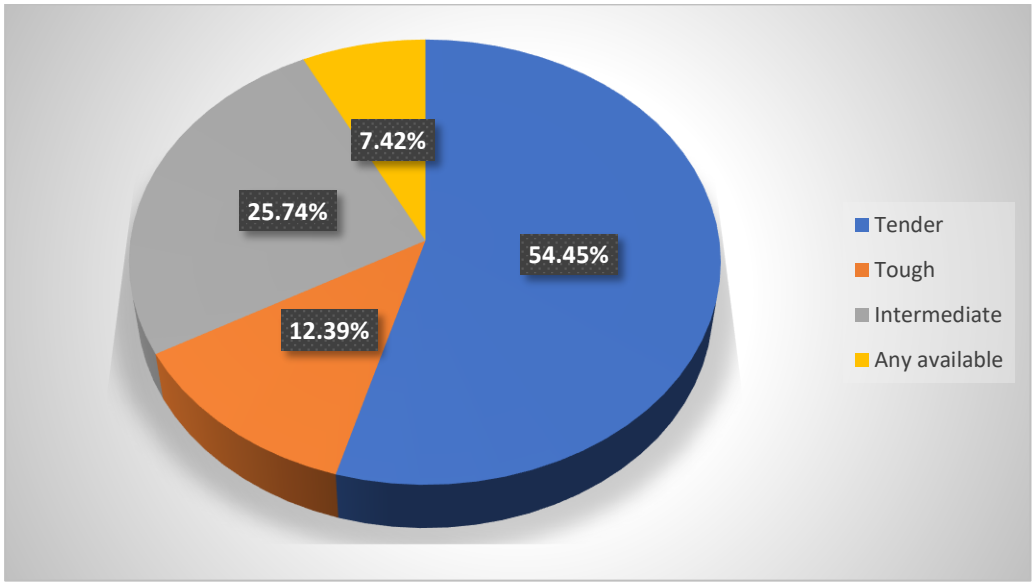
Respondents were asked whether they will slaughter sick animals for consumption. Table 18, shows that majority (54.95%) of the respondents will not slaughter sick animals for meat whiles 45.05% of them indicated they will slaughter sick animals for meat to avoid losing them to death. This result suggest that majority of consumers are health-conscious and are not willing to compromise on their health and food safety. Thus, sick animals may be carriers of pathogens and this can lead to food poisoning when consumed (Menini *et al.,* 2022). Despite these serious health risks associated with sick animals, other respondents are willing to slaughter and consume meat of sick animals. The reason being that they want to save cost. Others too may not be aware of the health implications of consuming meat of such animals.

Comparatively, majority of consumers in the Assin South district will slaughter sick animals for meat whiles majority of consumers in the Cape Coast metropolis will not slaughter sick animals for meat. The rural and urban differences between the Assin South district and Cape Coast metropolis may account for these varied decisions by consumers

From Table 18, respondents were asked whether they will dress dead animals for meat. Majority (81.18%) of the respondents said they will not dress a dead animal for consumption, whiles 18.82% indicated their willingness to dress dead animals for consumption. In all majority of consumers in the Assin South district and Cape Coast metropolis will not dress dead animals for meat. This suggests that majority of the consumers in these two districts are health conscious. This result suggests that consumers

are conscious of the kind of meat they take in and are not willing to dress a carcass for consumption (Xazela *et al.*, 2017). However, few of the consumers will dress dead animals for consumption irrespective of the health implications. Economic constraints could be a reason for that. In situations of poverty or food insecurity, consumers may be forced to consume meat of sick animals due to limited access to alternative food sources (Akparibo, 2021). Economic constraints may override concerns about food safety and health risks.

Figure 7: Preferred Meat



Source: Field survey, Amoni (2023)

From Figure 7, consumers were asked their preferred meat characteristics using quality indicators as tenderness or toughness. Majority (54.45%) of the respondents preferred tender meat. The preference for tender meat is driven by sensory, cultural, and culinary factors, as well as consumer expectations of meat quality and eating experience. Tender meat is widely valued for its taste, texture, and versatility, making it a sought-after choice for consumers. Tender meat is often associated with a pleasurable eating

experience due to its soft texture and ease of chewing (Aaslyng *et al.,* 2017). Research suggests that consumers generally prefer meats that are tender, juicy, and flavorful, as these characteristics enhance overall sensory satisfaction and enjoyment (Jayasena *et al.,* 2015). Cultural preferences and traditions also play a significant role in shaping consumers' meat preferences (Ouma *et al.,* 2019). In many cultures, tender meat is considered a symbol of quality, abundance, and hospitality, and may be preferred for special occasions or celebratory meals (Ozdemir *et al.,* 2018). Tender meat is valued for its versatility in cooking and meal preparation, as it can be easily marinated, grilled, roasted, or braised to enhance flavor and tenderness (Brewer *et al.,* 2018). Consumers may choose tender meat cuts for their convenience and adaptability in various recipes and culinary styles.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Summary of Key Findings

Key findings for objective one was that chicken was the most predominant livestock species in the study areas.

Key finding for objective two was that livestock farmers in Assin South and Cape Coast metropolis practice the intensive and semi-intensive systems of housing livestock. The difference between the Assin South district and the Cape Coast metropolis in terms of housing livestock is the quality of construction. Whereas some farmers in Cape Coast have modernized intensive housing systems, some farmers in the Assin South have outmoded intensive systems of keeping livestock. Additionally, livestock farmers in the study areas observe signs such as "isolation from the flock", "rough wool", "change in fecal colour, texture and smell", to distinguish between sick and healthy animals on their farms. Relatedly, livestock farmers employ visual appraisal technique to detect diseases and wellness of livestock. The visual appraisal remains one of the traditional diagnoses of livestock used by farmers in Ghana and other parts of the world. Despite some limitations associated with the visual appraisal, it is relatively cheaper and convenient to use. Another finding was that livestock farmers in the study areas bury carcass as a way of disposing off dead animals. Similarly, few of them dress the carcass to eat.

Key findings for objective three was that livestock farmers encountered more than one disease outbreaks in a year. The study further revealed that Newcastle disease as the prevalent livestock disease in Assin South and Cape Coast metropolis. Additionally, the study revealed inadequate

capital as one of the financial challenges that hinder the construction of well-resourced housing systems for the livestock in the study areas. Thus, the livestock are poorly housed and this endangers their lives.

Key findings for objective four was that beef was the most preferred meat by consumers in the study areas. Thus, on any day, consumers within these study areas will choose beef over other meat types such as chicken, mutton, chevon, pork, bush meat and other types of meat. The study further revealed that majority of these consumers who prefer beef purchase them from butcher shops/abattoir because that is where they believe they can obtain fresh meat.

Key findings for objective five was that price of meat was the most ranked factor that influences consumers to purchase meat in the Assin South and Cape Coast metropolis. Thus consumers will choose price of meat over wholesomeness, neatness of dispensing environment, packaging, and availability when it comes to purchasing meat.

Conclusions

Poultry is the widely reared livestock species, followed by sheep, goat, cattle, pig, rabbit and snail in the study areas. Even though majority of farmers are into poultry production.

The intensive and semi-intensive system of housing livestock are widely practised by farmers in the Assin South District and Cape Coast metropolis. Additionally, livestock farmers in these study areas observe certain signs to distinguish sick animals from healthy ones. Further, livestock farmers in Assin South District and Cape Coast Metropolis employ the visual appraisal technique to diagnose diseases amongst the livestock.

Livestock farmers in the Assin South and Cape Coast metropolis are plaqued with diseases more than once in a year. Similarly, Newcastle disease is the most prevalent disease amongst livestock farmers in the study area. Further, livestock are poorly housed due to inadequate capital by farmers.

Beef is the most preferred meat by consumers in the study areas. Furthermore, the butcher's shop is the main source of meat for consumers.

Finally, price of meat is the main determinant of consumer decision to purchase meat in the Assin South and Cape Coast metropolis.

Recommendations

Government through the Ministry of Food and Agriculture should provide training programs and workshops for farmers on disease prevention, early detection, and management practices. This could include educating them on proper animal husbandry techniques, biosecurity measures, and recognizing signs of illness.

The Ministry of Food and Agriculture should implement and subsidize vaccination programs for common livestock diseases. This can help build immunity within livestock populations and reduce the spread of contagious diseases.

The FDA and town council should collaborate with veterinary officers to regularly check the wholesomeness of meat sold at abattoirs/butcher's shop. This can be done through unannounced visits to large markets and busy abattoirs in the country. This is important to ensure food safety for consumers given that abattoirs/butcher's shop is the main source of meat for consumers.

The government should provide a comprehensive subsidy to livestock farmers particularly on livestock feed and drugs. Such subsidy will enable

livestock producers to increase their output and bring stability in price. This will ensure that meat is affordable to the average consumer. Consequently an increase in the quantity of meat purchased will result in an increase in revenue for livestock producers.

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APPENDIX

UNIVERSITY OF CAPE COAST
SCHOOL OF AGRICULTURE
DEPARTMENT OF ANIMAL SCIENCE

Topic:

LIVESTOCK PRODUCTION AND CONSUMPTION PRACTICES IN ASSIN SOUTH AND CAPE COAST METROPOLIS IN THE CENTRAL REGION

Questionnaire for Livestock Producers

Introduction:

This questionnaire is aimed at assessing the livestock production and consumption practices among inhabitants in the Assin South and Cape Coast Metropolis in the Central Region

I would be grateful for your participation in this survey. The questions am going to ask concern animal production practices; it would take about 20 minutes to go through these questions with you.

Participation voluntary:

"Please also note that, participation in this survey is voluntary. For this reason, you can choose not to answer any individual question or all of the questions. This notwithstanding, I look forward to your participation since your views are critical to this research".

Please, can I proceed to ask the questions? 1. Yes [ ] 2. No [ ]

Confidentiality Statement:

"The data from you would be treated confidentially. Only the researcher, the supervisors and the enumerators will have access to the data. Your personal identity will be kept anonymous and be shielded from any other person or organization".

Name of region……..

Name of District. ……

Village/Town……

Date of interview ……....

Enumerator Name: _____

BACKGROUND OF THE RESPONDENT

1. Gender Male [ ] Female [ ]

2. Age of respondent:

Less than 20 [ ] 20-30 [ ] 30-40 [ ] 40-50 [ ] 50-60 [ ] other [ ]

3. Marital status

Single [ ] Married [ ] Divorced [ ] Separated [ ] Widow/Widower [ ]

4. Number of dependents……

5. Educational background

Primary [ ] JHS [ ] SHS [ ] Tertiary [ ] No formal education [ ]

6. How long have you been rearing livestock?

7. What type(s) of livestock do you rear?

8. What influenced your choice of a particular type of livestock, was it based on

9. Which type of feed do you give the animals?

10. Why are you involved in livestock production?

11. Which housing system do you employ?

a. Extensive b. Semi Intensive c. Intensive

12. Which of these livestock housing systems do you think is most practiced in this community?

a. Extensive b. Semi-Intensive c. Intensive

13. What challenges do you face in terms of housing your livestock?

a. Construction b. Access to building c. Inadequate capital d. Access to land e. All

14. What effect does your housing system have on the animals?

a. High mortality rate b. Disease outbreak c. Exposure to predators d. No effect

HEALTH MANAGEMENT

15. Can you distinguish between sick and healthy animal? a. Yes [ ] b. No [ ]

16. If yes, what are the signs you use to differentiate?

a. Isolation from the flock b. Change in fecal colour, texture, and smell

c. Panting d. rough wool e. all the above f. Others

17. By what techniques do you diagnose disease on your farm?

a. Percussion b. Palpation c. Visual appraisal d. Auscultation

18. Do you practice ante-mortem and post-mortem during slaughter of your animals?

a. Yes b. No

19. Have you encountered in this year?

Yes [ ] No [ ]

20. If yes, how did you deal with it?

a. I reported it to the veterinary agent b. I sold all the animal c. I slaughter for meat d. I administered drug

21. How many cases of disease outbreak have you encountered in this year?

a. Once b. Twice c. Thrice d. Forth e. Others (specify)

22. What kind of disease do you commonly experience?

a. African swine fever b. Foot and mouth disease c. Coccidiosis

d. Newcastle e. PPR

f. Others (specify)

23. What challenges do you face in your farm in terms of disease?

a. Disease control b. Cost of Medication c. Access to Vaccination d. Ill health identification e. Access to veterinary drugs f. Drug administration

g. Access to disease resistant breed

24. What is your source of information on livestock production?

a. Extension agents b. Colleague farmers c. Media d. Veterinary personnel

25. What type of veterinary personnel is available to you?

a. Veterinary surgeon b. Veterinary technician c. Both

26. Are charges of veterinary personnel reasonable?

a. Reasonable b. Expensive

27. How much do they charge per visit to your farm?

…….

28. What do you do if your sick animals do not respond to treatment?

……

29. How do you dispose carcasses?

Sell them [ ] Cook and eat [ ] Bury them [ ] Other (Please specify)……

30. Give reasons to your response in item 29.

……

……..……

……..……

……..

31. How can your business be improved?

……

……..……

……..

UNIVERSITY OF CAPE COAST

SCHOOL OF AGRICULTURE

DEPARTMENT OF ANIMAL SCIENCE

Topic:

LIVESTOCK PRODUCTION AND CONSUMPTION PRACTICES IN ASSIN SOUTH AND CAPE COAST METROPOLIS IN THE CENTRAL REGION

Questionnaire for Meat consumers

Introduction:

This questionnaire is aimed at assessing the livestock production and consumption practices among inhabitants in the Assin South and Cape Coast Metropolis in the Central Region

I would be grateful for your participation in this survey. The questions am going to ask concern meat consumption practices; it would take about 20 minutes to go through these questions with you.

Participation voluntary:

"Please also note that, participation in this survey is voluntary. For this reason, you can choose not to answer any individual question or all of the questions. This notwithstanding, I look forward to your participation since your views are critical to this research".

Please, can I proceed to ask the questions? 1. Yes [ ] 2. No [ ]

Confidentiality Statement:

"The data from you would be treated confidentially. Only the researcher, the supervisors and the enumerators will have access to the data. Your personal identity will be kept anonymous and be shielded from any other person or organization".

Name of region……..

Name of District. ……

Village/Town……

Date of interview ……....

Enumerator Name: _____

1. Gender

   Male [ ] Female [ ]

2. Age of respondent:

   Less than 20 [ ] 20-30 [ ] 30-40 [ ] 40-50 [ ] 50-60 [ ]

   Other [ ] Please specify…….

3. Marital status

   Single [ ] Married [ ] Divorced [ ] Separated[ ] Widow/Widower [ ]

4. Number of dependents…….

5. Religion

   Christian [ ] Muslim [ ] Traditionalist [ ] Other [ ]

6. Occupation

   Unemployed [ ] Public servant [ ] Civil servant [ ] Trader [ ]

   Farmer [ ] Other Please

   Specify…….

7. Educational status

   Primary [ ] Secondary [ ]Tertiary [ ] No formal Education [ ]

8. How often do you consume meat

   Daily [ ] Once a week [ ] Weekends [ ] Occasionally [ ]

9. Choice of meat

   Chicken [ ] Beef [ ] Mutton [ ] Chevon [ ] Pork [ ] Bush meat [ ]

   Other [ ] Please specify……..

10. Where are the sources of meat household consumed

    Cold stores purchasing points [ ] Open market [ ] Super markets [ ]

    Butcher shops/abattoir [ ] Self-slaughter [ ]

11. What factors influence your decision to purchase meat at a given point?

    Wholesomeness of the meat [ ] Price of the meat [ ]

Neatness of the dispensing environment [ ] Religion of Slaughter men [ ]

Packaging [ ] Availability [ ] Colour [ ] Certification [ ]

Other (please specify) ……

12. How do you see meat handling in your locality

Unhygienic [ ] Hygienic [ ] Normal [ ]

13. What are your expectations from the meat industry

Strict and competent Inspection regime [ ]Training programme for butchers [ ]

Prices should be moderate or low [ ] Dsease free livestock [ ]

Modern abattoirs or slaughter facilities [ ] Disease prevention [ ] All the above [ ]

14. Will you pay more for high quality meat?

Yes [ ] No [ ]

15. Do you sometimes slaughter sick animals for consumption?

Yes [ ] No [ ]

16. Explain your response to Q15.

……

……..…

……

….

17. Do you sometimes dress dead animals for consumption?

Yes [ ] No [ ]

18. Explain your response to Q17.

……

……

……

……

19. What type of meat do you prefer to purchase?

Tender [ ] Tough [ ] Intermediate [ ] Any available [ ]

20. Explain your response in response 19.

……

……

……

……

21. Do you frequently patronize broiler chicken meat?

Yes [ ] No [ ]

22. Explain your response in response 21.

……

……

……

23. Which would you choose?

Broiler chicken meat [ ] Layer chicken meat [ ]

24. Explain your answer in response 23.

25. Do you have a specific meat for a specific meal?

26. Explain your response in question 25.

……

……

……

27. Which would you prefer?

High quality meat [ ] Cheaper meat [ ] More expensive meat [ ]

Others (Please

specify)……

28. How do you know the meat is ready when cooking?

……

……

……