

**Meat Industry Development in Nigeria: Implications of the Consumers' Perspective**

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### Abstract

The study was conducted in three local government areas of Edo state of Nigeria. Livestock development/husbandry is growing with livestock – goat, sheep, pig, poultry and cattle very popular in production and consumption. The increasing social economic position of consumers in the developing countries – particularly in Nigeria plays an important role in the food consumption patterns. Consumer preference for quality meat is becoming evident with important consequences for the transformations in the livestock industry. However there is not much known about how consumers value the quality of meat or how it affects their preference. This study's objectives are to determine compositional quality preferences of consumers and to use the outcome of the objectives to advance improvement in the livestock industry. A convenient non probability sample of 343 respondents was used to obtain the study data and the data was then analysed with Stata 12 analysis software. Lean meat was the most preferred, followed by lean meat with moderate fat. Price, availability and social economic factors were significant in determining consumer preference. The study has strong implication for livestock management - stock selection, breeding, pasture management and housing. This study has some limitations - the size of the sample and its homogeneity make generalisation difficult considering the diversity of the country.

**Keywords:** Consumer preference; Livestock development; Livestock management; Meat industry; Meat production; Meat quality.

### Introduction

Meat industry development is an integral part of the strategy for the advancement of the entire livestock value chain development with a strong degree of integration of the producers and consumers. Many countries have different meat consumption patterns and livestock production systems which impact on the products delivered to the market. The demand for meat across countries and regions has been studied to be rapidly on the increase with a 2030 projection of per capita consumption of 36.7 kilogram (kg) of meat per year for the developing countries (FAO 2003). This projection however varies across the Sub-Sahara Africa, Asia, Latin America and the Caribbean. It could be as low as 13.4kg for Sub-Sahara Africa, 11.7 kg for South Asia and, as high as 58.5kg for East Asia and 76.6kg for Latin America and the Caribbean by 2030 (FAO 2003). This exponential increase in demand for meat has implications for production both in quantity and the quality of livestock to be produced and the subsequent meat products to be obtained from them. In Eastern and Central Africa (ECA) for example, there is growing demand for quality meat products and it is driving opportunities for value addition (Kurwijila, Birungi, Makokha, Musahara, Otika, Adissu, & Omere 2011).

Nigeria livestock industry is small and slow-growing relative to the population relying on it for meat (Agboola & Balcilar 2012; Babatunde & Qaim 2010). In 2010, the grazing livestock accounted for 108.6 million of the total livestock production (Earth Policy Institute

2012). Poultry, pig, sheep, goat and cattle are the main livestock of marketing importance and apart from poultry and pigs, other livestock types are mainly local breeds of animals.

The Livestock industry is the major source of protein supply for the large population, contributing 5-6% of the country's total gross domestic product (GDP) and 15-20% of the agricultural GDP (Mshelbwala 2013). An industry as important as this needs supports through various intervention mechanisms including obtaining the perspective of the final consumers. Value chain development approach has been advocated for this purpose; it involves interventions from various participants (often with different objectives, different starting points and assumptions), where no single participant is in total control of the progress towards a particular objective (Donovan & Poole 2013). The consumers as a value member of the chain are important to the development strategy to be adopted for the livestock industry, as the end users of the resultant products.

The consumers demand particular qualities for a range of products delivered by the meat industry; this is very important as it has implications for production and management requirements of the livestock industry. It will dictate the breed of animals to be selected, feed and management practices for raising the animals from which the meat is sourced. Studies suggest most producers of livestock focus on meeting the demand for more animal products of almost any kind to meet the nutritional needs of consumers (Devendra 2002, 2007). The animals used to produce meat in the developing countries live under various harsh conditions often of poor feeding regime and grow more slowly, yielding older animals for slaughter from which meat that is tough, less juicy and of a lower quality that differs considerably from those obtained in developed countries. However, it is noted that some consumers in the developing countries are demanding quality meat. High demand creates challenges to meeting both the quantity and the quality of meat the consumers need (Adetunji & Rauf 2012; Webb & Erasmus 2013).

The increasing social economic conditions of the consumers in the developing countries can be assessed from changes in their consumption pattern (FAO 2013). Meat or meat cut has different individual or collective attributes consumers seek or prefer. Understanding consumer's pattern of meat choice and the reasons that influence their preferences are important more so that meat quality assessment is a contentious issue as the definition of quality continues to evolve (Fortomaris, Arsenos, Georgiadis, Banos, Stamataris, & Zygoyiannis 2006). Taste, nutrition, product safety and price are important determinants in food selection across the two worlds with more consumers in the developing countries demanding same product attributes as the counterparts in the developed countries (Ozimek 2011). Culture, traditions, customs, taboos also play significant roles in the consumption of certain types of meat (Johnson et al. 2011).

Despite the increase in consumption, the quality of meat consumed remains of interest from a marketing perspective. Changing consumer demand has influence on the market for all types of meat, due to changes in attitudes toward diet and consciousness about healthy living (Moschini 1991) as studies have indicated relationship between some components of foods quantity-wise and some cancers and chronic diseases in humans (Baade et al. 2012; Youl, Baade & Meng 2012). Consumers' preferences for certain products are becoming more evident in the market as the behaviour they demonstrate suggests that they seek particular quality attributes in the products (Munene 2006). Therefore information about consumers' meat preference is crucial in developing and implementing appropriate livestock improvement strategies.

Gracia and de-Magistris (2013); Latvala, Niva, Mäkelä, Pouta, Heikkilä, Kotro and Forsman-Hugg (2012); Okunlola, (2012) have investigated consumer preference for different meat sources and have placed preference value on those sources. However, there is lack of study about consumer preference for the compositional and palatability qualities of meat in many developing countries. This paper focuses on the compositional quality which is the objective parameter for meat assessment as compositional and palatability qualities having a derived relationship between them.

The study was designed to provide some inputs into the producer end of the livestock value chain from the consumers' perspective. Livestock value chain is a market-focused collaboration among different stakeholders that produce and market value-added products. It is a whole range of activities required to bring quality products to final consumers (Delgado 2003). Value chain study is essential to an understanding of markets, their relationships, the participation of different players, and the critical constraints that limit the growth of livestock production and consequently the competitiveness of smallholder farmers (Rota 2010; Poole 2013).

The aim of this study therefore is to improve the production of quality livestock that yield quality meat using the consumer preference as a guide. In this context, the study objectives include (1) to determine compositional quality preference of consumers and (2), to determine the factors that influence objective "1". The compositional quality of any meat refers to its "lean to fat" ratio and this in part affects the visual assessment in terms of colour, marbling and water holding capacity. These quality attributes are important to consumers' preference for meat cuts.

The sections of the article are organized as follows: the introduction is followed by a review of relevant literature on the livestock production, meat quality and consumer meat preference. The methodology, result and discussion of the findings are presented after the literature review and finally, the paper concludes with implication and limitation.

## **Literature review**

### **Livestock production, meat quality and consumer preference**

Livestock production; primarily poultry, pig, goat, sheep and cattle is carried out mainly at subsistence level and this level of agriculture is the main feeder of the meat industry in the developing countries (Momoh & Ochaba 2002). This type of production system is characterised by inefficiency in input-output relationships – the poor housing, nutrition, animal health and feed conversion efficiency that lead to the production of livestock that takes longer to mature and yield poor quality meat (AVMA 2010).

According to Permentier et al. (2013), the common determinant of meat quality is the protein – fat ratio. Meat is composed of water, fat, protein, minerals and a small proportion of carbohydrate. The most valuable component from the nutritional point of view is protein and it is the type and amount that define the quality of any meat irrespective of the source or the state of preparation. Animal studies show that fat in meat is deposited subcutaneous - under the skin, around the organs like kidney and heart or between muscles – inter-muscular fat (Wood et al., 2008; FAO 2013). Fat is an essential component of meat that impact on its juiciness, flavour and texture. Fat – monounsaturated or polyunsaturated in meat provides the body with essential fatty acids that cannot be synthesised by humans but saturated fats are detrimental to human health and constitutes bulk of the fat in meat (FAO 2013). Furthermore,

Moloney et al. (2002) noted that increase in fat deposition in animals is generally accompanied by an increase in intramuscular fat concentration and that the degree of fatness is influenced by genotype, the weight of the carcass and how close the animal is to its full maturity when slaughtered. Therefore management of livestock to yield better quality meat is achieved by better understanding of how livestock body weight is gained, the distribution and composition.

Studies using consumer behaviour to investigate production systems abound – such as willingness to pay for organic products (Ogbeide 2013, Ogbeide et al. 2014a & b), quality assessment (Verma & Gupta 2004) and preference for particular products (Loureiro 2003; Chryssohoidis & Krystallis 2005; Okunlola 2012; Gracia & de-Magistris 2013; Latvala et al. 2012). Consumers' preference for quality meat can be influenced by their attitude towards health and the environment (Bhaskaran et al. 2006). Consumers are concerned about the contribution of the livestock sector directly and indirectly to climate change through the emissions of greenhouse gases such as carbon dioxide (CO<sub>2</sub>), methane and nitrous oxide.

FAO (2014) noted that globally, the sector contributes 18 percent - 7.1 billion tonnes of CO<sub>2</sub> equivalent of global greenhouse gas emissions and nine percent of global CO<sub>2</sub>. Concerns about human health are evidently considered in the meat market as consumers are keenly aware of the negative effects of the consumption of fatty meat. Science has also implicated the quality of the meat consumed as responsible for some chronic, long-term health problems that impact on consumers and government financially. Diets high in animal fats, which tend to contain high proportions of saturated fatty acids have implications for cardiovascular disease. (Kearney 2010; Baade et al. 2012; Youl, Baade & Meng 2012; KwaZulu-Natal Department of Health 2001). Consumers want quality meat and in part influence their preference.

An assessment of meat quality can vary between individuals; cultural inclination of consumers can also affect quality perception, all due to the objective and subjective nature of the quality attributes of meat upon which the consumers base their preference (Fortomaris et al. 2006). FAO (1992); Permentier et al., (2013) reported that meat quality refers to the compositional quality (lean to fat ratio) and palatability quality (juiciness, tenderness, and flavour) of meat. This suggests that there are two major aspects of meat quality, compositional quality which is the objective attribute and palatability quality as the subjective attribute perceived by the consumer (FAO 1992; Fortomaris et al. 2006). Consumers' first assessment of meat is based on the appearance which is the visual identification of quality based on color, marbling, and water holding capacity. According to FAO (2013), meat of good compositional quality should have a normal uniform color, it should have marbling throughout the cut (marbling is defined as small streaks of fat dispersed within the meat); which is an indication of tenderness and juiciness as well as flavour. Certain compositional qualities are heritable and can be directly influenced by livestock producers through appropriate livestock breeding and management programs (Curtis et al. 2007). Wood et al., (2008) noted that when fat is deposited between the fibre bundles of a muscle, it leads to higher accumulations of marbling, meat tenderness and improved flavour. Therefore, marbled meat is a tender with improved flavour. Many consumers prefer marbled meat for steaks and other roasted meat dishes (Wood et al. 2008) due to its tenderness (easy to shear) and flavour.

Flavour is mainly determined at the cooking stage but is influenced by the quality of meat. It occurs when the denatured proteins on the surface of the meat recombine with the sugars present. The combination creates the "meaty" flavour and changes the colour; this process is referred to as "browning" or "Maillard" reaction".

Martinez et al., (2007) reported that meat quality attributes such as flavour, tenderness, nutrition, and safety are not apparent to consumers until the product is consumed but studies have shown that consumers value them - e.g. (Beriaín, Sánchez & Carr 2009; Lou 2009) and most of these attributes are a function of good compositional qualities of meat.

Davis, Yen and Lin (2007) reported consumers are now inclined toward healthier eating and food producers have responded by providing foods that meet or even exceed the consumers' expectations, with added healthy attributes and health claims.

The social economic characteristics of consumers affect their preference for quality meat. Oczkowski (1994) reported that theoretical and empirical evidences suggest that product price determines its quality, reputation and objective characteristics; therefore the amount of household income in the form of price paid for meat impact on the consumers' preference.

Schnepf (2013) noted that for households with low disposable income where food expenditures are a large share of the budget, higher meat prices result in diminished purchasing power and may force difficult budgetary tradeoffs.

## Hypotheses

The price consumers are willing to pay for meat is an important component of purchasing decision that can influence their quality or meat type preference. Ogundari and Akinbigun (2010) in their study of the influence of price on consumer preference reported that due to high price of quality meat, an average household would purchase chicken. Nilsson et al., (2006); Pouta et al., (2010) noted that meat consumers that are price conscious represent a large segment of the market and those that are not averse to price form a small segment that have positive preference for the compositional quality, sustainable methods of production or value the nutritional attributes of quality meat. From the statements on price, it was hypothesised that:

H1: the higher the price of quality meat, the lower the number of consumers with preference for it.

While price seem to be a very important consideration in consumer preference, availability of quality meat cuts affects the price paid, limits preference/choice and subjects consumers to what is available and not necessarily what they preferred (Akinwumi et al. 2011). According to GEMS (2012) the limited quality range is a concern for the market and a big opportunity for the value chain to deliver improved "quality" meat products. Curtis et al., (2007) noted that compositional and palatability qualities were rated by consumers as higher than price in their preference scale and from these assumptions, it was proposed:

H2: that the more the availability of quality meat, the higher the number of consumers with preference for it.

Consumers' income determines purchasing power and can affect consumer preference (Hawkins et al., 2003). There is a correlation among education, occupation, and income in product quality preference; specifically Yakubu, Garba, Jibri and Zubairu (2013) indicated a positive relationship between higher household income and beef preference *ceteris paribus* but all other household expenditures can directly influence meat quality preference. The impact analysis of family life cycle suggests that consumer preference can be affected by major changes that occur in the life of the consumers and are able to modify consumers'

affective reactions, cognitions, buying and consumption behaviours (Peter & Olson, 2005). It creates a string of changes that occur over time in the life of the individual family members (Loudon & Della, 1993; Schiffman & Kanuk, 2006). Age influences how well the body utilizes the nutrient it receives; while red meat is good for the body, fatty meat must be consumed sparingly for health reasons by consumers (Kearney 2010; Baade et al. 2012; Youl, Baade & Meng 2012) and especially the elderly ones (KwaZulu-Natal Department of Health 2001) and this knowledge can affect consumer meat preference. Therefore it was hypothesised:

H3: that the higher the social economic condition of the consumers, the higher the number of consumers with preference for quality meat.

These hypotheses, if this study was conducted in developed countries or countries with advanced livestock industry will appear not novel. The livestock in developed countries are raised often time to meet or for a predetermined market where the consumers determine the quality of the supplied product. However Nigerian livestock industry is far away from this norm compared to the developed countries. Therefore these assumptions are worthwhile investigating as consumers' preference for quality meat cannot be discussed in isolation of availability and price ramifications.

**Methodology: Data collection and analysis method**

This study was carried out in Southern Nigeria in three local government areas (LGA) - Oredo, Ovia South-West and Orhionmwon LGAs of Edo state, Nigeria. These local government areas except Oredo are farming area with the civil service the alternative employment. The Oredo LGA is mainly the administrative and commercial area of the state.

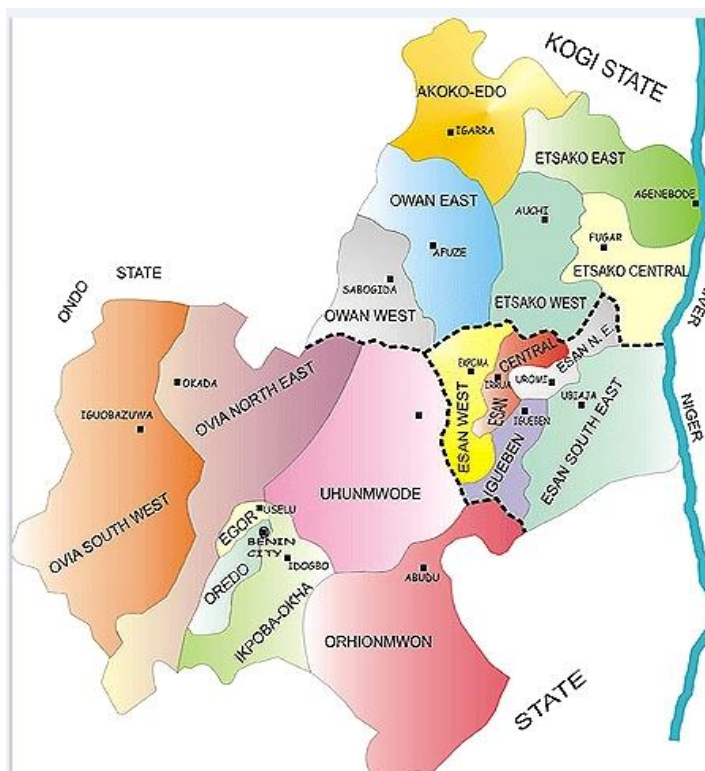


Figure 1 Map of Edo State showing the Local Government Areas

These local government areas are proliferated with many small to medium and a couple of large scale goat, sheep, rabbit, piggery and poultry farms. However, there is generally unhindered livestock trade across the country. The goat, sheep and cattle that provide meat sources are mainly from the Northern part of the country though there are few cattle farms in the state. The animals raised on these farms and the ones brought in from interstate are mainly processed and consumed locally in the wet markets, restaurants and supermarkets. The products – pork, chicken and beef used for the study were chosen for their wide acceptance and consumption in the study area.

Questionnaire was used to elicit information from the respondents. The questionnaire was structured to obtain three groups of information. It was outlined first and foremost to obtain information about respondents' preference for meat quality, secondly to determine the factors that influence their preference and finally to obtain information on the social demographic characteristics of the respondents. The social demographic information was collected at the end following Canada Business Network (2012) recommendation as demographic details can be intrusive and sensitive in some cultures. Non-probability - convenience sampling method was used to pick the respondents. The sampling was done on the assumption that all respondents are meat consumers; however potential respondents were probed whether they consume meat or all the meat types in the study sample. The ones that answered "No" to the question were not surveyed.

The survey was conducted in one month – ended 15 March 2013 in the order – Oredo, Ovia South West and Orhionmwon LGAs. From Oredo, Ovia South-West and Orhionmwon LGAs, 133, 100 and 110 respondents respectively were surveyed. Potential respondents were intersected at public and market places; the purpose of the survey was explained to them and a polite request was made to them to participate in the survey. The survey took approximately 10 minutes to complete.

Three different quality types of beef, chicken and pork cuts were pictorially presented to all the respondents from which they indicated their preferences based on the appearance and descriptive characteristics of the meat cut in the pictures. The different quality types presented to the respondents reflected the main categorisation of the compositional quality of meat – Lean, lean with moderate fat and fatty meat by FAO (1992; 2013); Permentier et al. (2013). The questionnaire was administered by proxy by trained assistants. A total of 343 duly completed questionnaires were obtained.

Table 1 Factors influencing consumer meat preference

Factors	Literature
Price	(Ogundari and Akinbigun 2010; Nilsson et al. 2006; Pouta et al. 2010)
Availability	(Akinwumi et al. 2011; GEMS 2012; Curtis et al. 2007)
Social	(Hawkins et al. 2003; Yakubu et al. 2013; Peter & Olson, 2005; Loudon & Della, 1993; Schiffman & Kanuk, 2006)

The data collected were screened for accuracy and were analysed using the Stata 12 analysis software. The sample statistics was determined using frequency distribution and logit model regression analysis was used to establish relationships. In the logit regression analysis to determine consumer preference, the respondents' scores for the three animal types were aggregated based on meat quality type. The socio-demographic variables were analysed



individually along side price and availability to determine their influence on consumer meat quality preference. Socio-demographic variables were also used as a composite variable after summation. However, it suffices to mention that some of the variables would have relational effect on one another to the effect of affecting consumer preference. For instance a respondent with higher education is likely to have a higher income, and would have preference for quality meat *ceteris paribus*.

## Results and discussion

### Descriptive Statistics of respondents

Table 2. Demographic Profile of Sample (n=343)

Characteristics		# of Respondents	% Respondents
Gender	Male	167	48.7
	Female	176	51.3
Age Group	18 - 29 years	71	20.7
	30 - 49 years	100	29.2
	50 - 59 years	66	19.2
	60 - 69 years	65	19.0
	70 + years	41	12.0
Education	School Leaver's certificate.	57	16.6
	Secondary school certificate	91	26.5
	OND/NCE	109	31.8
	Bachelor's degree/HND	57	16.6
	Higher degrees	19	5.5
	Others	10	2.9
Marital status	Single	172	50.1
	Married or cohabiting	171	49.9
Occupation	Professionals	72	21.0
	Clerical and administrative	84	24.5
	Education	89	26.0
	Small business owner	84	24.5
	Others	14	4.0
Monthly Income	Up to ₦25,000	45	13.1
	₦25,001 - ₦50,000	107	31.2
	₦50,001 - ₦75,000	130	37.9
	₦75,001 - ₦100,000	35	10.2
	₦100,001 - ₦150,000	19	5.5
	₦150,001 plus	7	2.1

₦100 (naira) is an equivalent of \$0.62 USD (American dollar) at the time of the study.

The descriptive statistics of the respondents' profile presented in Table 2 shows that the respondents represent a substantial percentage of the labour market, an active respondent group, educated and employed. The gender statistics was slightly tilted towards the female (51.3%) while the singles and the married respondents were almost even. Respondents that earn 50,001 - 75,000 Naira represented the modal income group.

### Consumers' preference for the compositional quality of meat

The result of consumer preference is shown in Table 3. It shows that across the study meat sources, a higher proportion of consumers preferred lean meat followed by meat with moderate fat while fewer consumers – less than 14.0% of respondents preferred fatty meats. Almost 53% of the respondents preferred lean pork while 51.2% of the sample prefers lean beef. This is an indication of a viable market not just for the quality meat but also for meat products and sources. It was inferred from the result that the expansion of production is critical while maintaining the qualities that are desired by the consumers.

Table 3 Consumers preference for the compositional quality of meat – lean to fat ratio. (n=343)

Meat quality	Characteristics	Respondent preference (%) beef	Respondent preference (%) chicken	Respondent preference (%) pork
Lean meat	Lean muscle meat with all visible fat and connective tissue removed	51.2	49.6	52.9
Lean meat with moderate fat	Muscle meat trimmings with small quantities of connective tissue (<10%) and body fats (<10%)	35.8	38.4	39.0
Fatty meat	Muscle meat trimmings with connective tissue (<20%) and body fats (<20%)	13.0	12.0	8.1

On the other end of the scale, respondents that prefer fatty beef (13.0%) were more than those that preferred fatty pork. The study did not analyse the motivation behind the preference for fatty beef compare to fatty pork, however, the percentage of respondents in this group was small and should not be a concern for the market. They could represent the low income households that often purchase low quality meat (Ogundari & Akinbigun 2010). Across the three meat quality levels, the consumers that preferred lean chicken meat accounted for about 50% of the sample, 38.4% and 12.0% of the sample preferred lean meat with moderate fat and fatty meat respectively. Chicken in relation to other meat source is often not an everyday meat for most consumers; usually for special occasions or when consumers eat away from home.

### Factors that influence consumer preference for meat quality

The preference of consumers for a product is influenced by a lot of factors some of which the consumers have no direct control, some inherited by culture or circumstance of birth. The relationships between compositional preference and meat price, availability and social demographic factors were considered. Social demographic factors - gender, age, education, occupation, income were regressed individually and as a composite variable against the outcome variables.

Table 4 Factors that influence consumer meat preference

variable	Lean meat		Lean meat with moderate fat		Fatty meat	
	coef.	Sign	coef.	Sign	coef.	Sign
Gender	0.447	ns	0.303	ns	0.452	ns
Age	0.389	ns	0.239	ns	-0.640	**
Education	0.145	***	0.353	ns	-0.254	**
Marital status	0.219	ns	0.282	ns	0.424	ns
Occupation	0.215	ns	0.415	ns	0.418	ns
Monthly income	0.120	***	0.170	***	-0.523	***
Price	-0.271	**	0.450	ns	0.128	ns
Availability	0.158	***	0.353	**	0.455	ns
Composite social demographics	0.614	**	0.301	ns	-0.638	**

\*\*\*, \*\*, \* Indicates estimated coefficient is significant at the .01 level, 0.05 level, 0.10 level respectively; coef. indicates coefficient, ns indicates non-significant and sign = significant level.

The result indicates gender, marital status and occupation have no significant effects on consumer preference for “lean meat”, “lean meat with moderate fat” or “fatty meat”. Age of respondents was found to have no significant effect on preference for “lean meat” and “lean meat with moderate fat” but significant negatively for “fatty meat”. It can be inferred that consumers will show lack of interest for fatty meat because of the health issues

associated with the consumption, particularly for low active and elderly consumers. This inference supports Kearney (2010), Baade et al., (2012), Youl, Baade and Meng (2012) and KwaZulu-Natal Department of Health (2001) reports that warned against eating of fatty food.

The regression outcome of education on respondent's preference for "lean meat with moderate fat" was positive but not significant. However, this relationship shows positive and negative significance for "lean meat" and "fatty meat" respectively. This is an indication that the respondents apart from their general education are also knowledgeable about meat quality. Hence *ceteris paribus*, at 0.01 significant level, respondents preferred "lean meat" and lacked preference for "fatty meat" at 0.05 significant level. This outcome supports Peter & Olson, (2005); Yakubu, Garba, Jibri and Zubairu (2013).

Furthermore the regression analysis indicated that across the three different meat compositions, income had a significant effect on consumer preference all things being equal. An increase in income will cause preference for "lean meat" and "lean meat with moderate fat" but will cause a lack of preference for "fatty meat". Considering the improvement in the social economic capacity of the average citizens particularly in the developing countries, the ability to make appropriate choice of product has increased. Preference is longer determined by what is available to many consumers but often what is best for them. The amount of disposable income available to them is useful in determining their preference.

In the study area, the price respondents indicated they can pay for meat affected their meat quality preference. For lean meat, the result shows that price was significant negatively in determining quality preference but no so for the lean meat with moderate fat and the fatty meat as the relationships were not significant, (refer to Table 4). Hypothesis 1 was confirmed for lean meat; the higher the price of quality meat, the lower the number of consumers with preference for it. This outcome reflects the affordability – the capacity of the consumers to pay for quality meat. High and low prices may not necessarily mean high and low quality respectively however, theoretical and empirical evidences suggest that product price determines its quality, reputation and objective characteristics (Oczkowski 1994). Lean meat attracts higher price (Farrell & Hopkins 2007) and thus determines preference and affordability. For households with low disposable income level where food expenditures can be a large share of the household budget, high meat prices result in diminished purchasing power and may force difficult budgetary trade-offs in terms of quantity and quality of meat bought (Schnepf 2013).

This study result indicates that the availability of quality meat is a determining factor to consumers in the study area in terms of their quality preference as choice can only be made from available options. Majority of animal slaughtered for meat are raised in conditions that hardly guarantee enough quality lean or marbled meat. The situation is widespread considering most livestock supply sources are under similar management conditions. While consumers prefer good quality meat, they are handicapped by the lack of it. The relationships between availability and consumer preference for lean and lean meat with moderate fat were significant positively. This confirm Hypothesis 2 that that the more the availability of quality meat, the higher the number of consumer with preference for it.

Despite the individual analysis of the social demographic factors, they were also aggregated into a composite variable to determine the influence of meat composition of consumer preference. The result indicates no significant effect on the preference for lean meat with moderate fat but has a positive significant effect on the preference for lean meat and a negative significant for that of fatty meat. Hypothesis 3 - the higher the social economic

condition of the consumers, the higher the number of consumers with preference for quality of meat was confirmed. Though individually some of the social demographic variables did not show any relationship, it is of importance to mention that some of the variables would have had a relational effect on one another resulting in the possibility of affecting consumer preference.

### **Implication:**

The contribution of consumers to the development or improvement of products is well documented and has been used by business organisations to further their market share position. Understanding the preference of consumers in relation to the compositional quality of meat is an important area of study that can be used to improve the livestock industry and meat marketing in Nigeria and other developing nations. Meat quality improvement begins from the farm and cuts across the rest of the value chain. The results of the hypotheses – particularly hypothesis 1 and 2 followed the price theory of demand and supply where less supply leads to higher price and more availability tend to lower price. The consumption of quality meat could appear the prerogative of the middle – upper class consumers in terms of affordability. When its availability increases such as it is in the developed countries, it becomes the norm for consumers to preference quality meat and for farmers to produce their meat for markets based on predetermined quality criteria. At that level, the low income consumers are able to consume quality meat low in fat. Translating the study outcomes to the producer end of the value chain involves some adjustments over time. At farm level, the selection of breeds and management practices must improve. Animals with good compositional qualities genetically should be selected and raised.

Certain genes in animals affect meat quality such as marbling, meat colour and firmness. Farmers need to invest in breeds that have genes for good carcass quality. Some breeds particularly the ones currently raised in Nigeria, on average do not yield as much income when sold as the exotic breeds. Larger framed, late-maturing breeds of livestock produce a higher proportion of lean meat while smaller, early-maturing livestock produce more marbling meat. With pork and beef production for example, light-weight animals are more efficient in converting feed into weight gain than heavy ones of the same type. They have relatively lower maintenance requirements and high compositional gain - mostly water and protein accumulation. This contrasts the heavy cattle and pigs that are heavier with high fat deposit. Chicken should be selected and bred for large breast muscles; this part often yields high quality lean meat. The livestock that are able to deliver the good quality meat should be selected or bred for the important and desirable traits.

Nutrition and feeding programs should be well tailored, the amount of protein converted into muscle from feed consumed is important. Poor nutrition and feeding regime are currently a major constraint to lean muscle gain. The type and quality of feed must be given serious attention. Animals require energy, protein, minerals and vitamins to maintain and gain body weight. These nutritive components come from grass and grains for extensively raised ruminant livestock and mainly from compounded mix of different feed ingredients for the intensive monogastric livestock.

For ruminant animals raised for meat, maximum production will only be achieved when adequate quantity of high quality forage is consumed daily. A balance of grass/legume mix should be encouraged. Legumes consistently have more protein, phosphorus, calcium and magnesium than grasses in their leaf and stem; the growth stage at which grasses are cut

also affects the amount of digestible protein deliverable to the animals. Therefore the science of animal nutrition and pasture management must be given serious attention. A synergy between the producers and the relevant scientists will play important roles in creating understanding and how to better manage livestock that will yield maximum quality meat per unit of carcass.

Pasture management must be improved. Harvesting should be done at the point where the protein content can be maximised. This requires proper understanding of how and when nutrients are accumulated in pasture for optimum gain. The works of pasture scientist/agronomist are important here for selection, introduction and improvement of existing and adaptable grass and legume species. Better management of pasture according to weather/season must be ensured. During the wet season when there is abundant and luxuriant growth of pasture, surplus pasture should be made into hay and stored for the dry season use.

Housing and handling must improve. Stress resulting from improper handling, temperature, humidity, light, sound, and even confinement most times decreases meat quality at the time of slaughter. These affect the market value such that meat or meat cuts quality is lower and this translates into lower price and lower revenue to the value chain. Though this study did not investigate the subjective palatability qualities of meat, it is noted that the compositional qualities of meat influence the subjective ones.

The implication of this study does not confer on the farmers the responsibility to meet all these challenges themselves but to seek partnerships with other members of the livestock value chain as no single participant is in full control of the activities for the improvement of the livestock industry.

### **Limitation**

This study was conducted in three local government areas. The areas combined is a microcosm when used to make an inference on the nation's consumer population. This can also be said of the number of respondents surveyed; therefore restraint must be exercised when using the data. This study did not investigate post-farmgate value chain issues such as animal transportation, slaughtering and storage which are important for meat quality. Further studies should be conducted in these areas. The sample was a convenient one and is small in size, the number of respondents in the study that are educated could be more than the normal average and that could have implications for the result outcomes and recommendation. It is suggested that the study be advanced to other zones or a comprehensive cross national survey be conducted and the result can be used to draw inference on the industry.

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