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Characterization of Pork Consumers and Preference for Quality Traits in Ethiopia

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Abstract: This study was carried out to characterize the socio-economic features of pork consumers, their preference for pork quality traits and motivational drivers to eat pork. Purposive and random sampling methods were used to select sampling areas and supermarkets. As it was difficult to find pork consumers in person, pork retailers at supermarkets were interviewed to describe their customers' (pork consumers') socio-economic features, volume of pork purchase and preference for different pork quality traits. For this, a total of 40 supermarkets were selected in six major Towns in Ethiopia. Structured questionnaire was used to collect the data through person to person interview. Selected supermarkets were clustered into three categories as small, medium and large scale pork retailers based on the volume of pork they sold per day. Collected data were analyzed using appropriate statistical procedures of SAS and SPSS software packages. Our data analysis showed that pork was mostly consumed by youth and adult groups in Ethiopia. Most pork consumers were people from Asian and European origin. Gender had no influence ($P>0.05$) on pork consumption. Leanness and freshness were mostly preferred pork quality traits. About 58% of the respondents were motivated to eat pork in order to get fat. Findings of this study can be used to develop research and development strategies for improving desired traits of pork and also pork marketing system of the country.

Key words: Ethiopian pork marketing · Pork consumer · Quality preference · Quality traits

INTRODUCTION

Pigs are among the livestock species with huge potential for poverty alleviation in African countries. They can be used to produce food, generate income and improve Africa's economy [1-2].

Pork is the main marketable product of pigs and it is an important protein source for humans. As pork supply and consumption increases, there is an increase in consumers' preference for quality traits [3]. Socio-cultural and economic factors such as religion, ethnicity, gender and wealth status might affect the demand of pork and pork products in the country [4, 5].

Traits such as tenderness, leanness, marbling, freshness and color are commonly taken as a measure of meat quality and such traits can be affected by several factors such as breed, age, sex, nutrition, disease and postharvest process like cooking [6-9].

Consumers' preference for various pork quality traits were studied previously and traits such as tenderness, freshness, leanness and color were reported as preferred quality traits [4-5, 10-12]. So, such traits can affect the demand of pork and pork products and also their market price. Information on such behavior of consumers is very crucial to have a sustainable and profitable pork business.

In Ethiopia, there is low demand for pork. Pork marketing has not been yet well developed in the country. This is mainly due to the socio-cultural reasons. As most Ethiopians are either Orthodox Christians or Muslim, none of them are eating pork due to religious reasons. So, foreigners living in Ethiopia can be expected to account for the major proportion of pork consumers in Ethiopia. However, there is no well studied in the country. Pork consumers and their purchasing behavior have not been characterized yet. Although there are some previous studies conducted in swine sector in Ethiopia, most of them are focusing on characterization of the production systems and health aspects [13-17].

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Thus, this study was initiated with the fund obtained from the Africa–Brazil Agricultural Innovation MKTPlace program (http://www.mktplace.org/site/index.php) in order to collect key information on the characteristics of pork consumers, volume of purchase and preference for pork quality traits. Findings of the study can enhance public awareness on the overall aspects of Ethiopian pork marketing systems, volume of pork demand and supply and preferred pork quality traits. Furthermore, outputs of the study can be used to develop strategies for improving Ethiopian pork marketing systems in the country.

MATERIALS AND MOTHODS

Description of the Study Area: In Ethiopia, pigs are mainly raised under small scale production systems of urban and pri-urban areas. The primary markets for pork are supermarkets. For data collection, three categories (small, medium and large) of supermarkets were selected based on volume of pork they sold per day. Data on the socio-economic characteristics of pork consumers, preference for quality traits and other important variables were collected in six major Towns: Debre-Zeit (11°48'N; 38°30'E), Nazreth (08°32'N; 39°22'E), Addis Ababa (09°02'N; 38°42'E), Bahir-Dar (11°37'N; 37°10'E), Gondar (12°39'N; 37°30'E) and Mekele (13°33'N; 39°30'E), where pork products and markets are mainly available. Among the 40 visited pork retailers (Supermarkets), 30.3%, 24.2%, 16.7%, 15.2%, 9.1% and 4.5% were selected from Addis Ababa, Debre -Zeit, Nazreth, Bahir-Dar, Mekele and Gondar Towns, respectively. The five study locations were far from the capital city of Ethiopia (Addis Ababa) by 45 to 729 km. The study locations had an elevation range of 1700 to 2300 m.a.s.l, average annual rainfall 549-1420 mm and temperature 12-45ºC. Urban and peri-urban agriculture were very well practiced in all of those six locations.

Sampling Techniques and Data Collection: Purposive and random sampling methods were used to select sampling areas and supermarkets. First, a preliminary survey was conducted in eleven Towns. Secondly, six towns that had major pork consumers and marketing were selected. Pre-tested structured questionnaire was employed to collect both qualitative and quantitative data using face to face interview method. The data collection focused on socio-economic characteristics of pork consumers, reasons for pork eating, seasonality of pork eating, frequency of pork purchase, preference for pork traits (leanness, freshness, fat) and other important variables. As it was difficult to find pork consumers in person, data on the studied parameters were collected indirectly by interviewing pork retailers at supermarkets. For this, 40 supermarkets selling pork and pork products were visited for data collection. Those supermarkets were clustered into three groups based on the volume of pork they sold per day as small scale (< 5kg/day), medium scale (5-10kg/day) and large scale (>10kg/day) retailers. The number of supermarkets interviewed in small, medium and large scale retailers were 24, 6 and 9, respectively. Data were collected by trained enumerators and agricultural experts.

Statistical Analysis: Data were coded and stored on SPSS [18] software package. Quantitative data were exported into Microsoft excel sheet to be analyzed using various statistical procedures of SAS [19] software packages. Various descriptive statistical procedures such as frequencies, percentages, means and SE were performed for the studied variables. The chi-square (x^2) and ANOVA tests were performed to check significant difference in the studied variables among the three scales of pork retailers (supermarkets). Rank variables means and standard errors were analyzed using the Proc Surveymeans procedures of SAS [19]. The level of significant differences between ranked means across the three retailers categories was analyzed using a non-parametric Kruskal Wallis test. An Alpha level of 0.05 was used to accept or reject the null hypothesis of no difference across the three scales of pork retailers.

RESULTS AND DISCUSSIONS

Characteristics of Pork Consumers: As Ethiopians are more of Orthodox and Muslim religion followers, in most cases pork is not used as human food and it can be said that pork consumption is not very well known in the country. However, there are pork production and informal marketing systems in the country. So, in our study, we raised a research question *"Who are pork consumers in Ethiopia?*"

The results of the study showed that pork consumers in Ethiopia were from diverse age, sex, religion, nationality and income levels, except restrictions for pork consumption was observed by Ethiopian Orthodoxes and Muslims. This agrees with FAOSTAT [20] report which revealed that pork consumption in Muslim countries is extremely low or absent; whereas, it can exceed 50 kg/capita/year in countries such as Austria, Poland, Germany and Lithuania. In terms of age groups, youths were first ranked age group that mostly consumed pork followed by adults age group (Table 1).

Table 1: Ranked means (SE) of pork consumers by age group (1=Mostly consume pork; 4=Least consume pork)

	Pork retailer category			
Age group	Small (<5kg/day)	Medium (5-10kg/day)	Large (>10kg/day)	P-value
Children	2.8 (0.24)	3.0 (0.26)	3.1 (0.30)	0.87
Youth	1.7 (0.18)	1.7 (0.33)	1.5 (0.27)	0.86
Adults	2.2 (0.16)	1.5 (0.22)	2.0 (0.38)	0.17
Elders	3.3 (0.2)	3.8 (0.17)	3.4 (0.27)	0.36

Where Small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively. SE refers to standard error.

Table 2: Pork consumers by sex groups

	Pork retailer category				
Sex group	Small (<5kg/day)	Medium (5-10kg/day)	Large (>10kg/day)	Total	P value
Who is eating pork?					
Only males	0 (0.0)	0 (0.0)	0 (0.0)	0	
Only females	0 (0.0)	0 (0.0)	0 (0.0)	0	
No gender difference	24 (61.5)	6 (15.4)	9 (23.1)	39	0.0008
Total	24	6	9	39	

Where numbers outside and inside parenthesis represent the number of respondents and percentage from row totals, respectively. Small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10 kg/day and >10kg/day of pork, respectively.

Table 3: Ranked means (SE) of pork consumers by religion groups (1=Mostly consume pork; 4=Least consume pork)

	Pork retailer category			
Religion	Small (<5kg/day)	Medium (5-10kg/day)	Large (>10kg/day)	P-value
Orthodox	3.1 (0.10)	3.2 (0.20)	3.0 (0.00)	0.67
Catholic	1.7 (0.14)	1.8 (0.17)	1.3 (0.18)	0.19
Protestant	1.5 (0.10)	1.5 (0.34)	1.7 (0.18)	0.55
Muslim	3.9 (0.15)	4.2 (0.20)	4.0 (0.00)	0.36

Where size of pork selling represented supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively. SE refers to standard error.

Table 4: Ranked means (SE) of pork consumers by nationality (1=Mostly consume pork; 5=Least consume pork)

	Pork retailer category			
Nationality	Small(<5kg/day)	Medium(5-10kg/day)	Large(>10kg/day)	P-value
Ethiopians	2.8 (0.39)	3.2 (0.75)	3.0 (0.63)	0.86
Other Africans	3.3 (0.27)	3.0 (0.68)	3.3 (0.36)	0.96
Americans	3.8 (0.30)	3.4 (0.51)	4.0 (0.44)	0.61
Europeans	2.5 (0.22)	1.8 (0.20)	2.6 (0.37)	0.22
Asians	2.2 (0.25)	2.8 (0.80)	1.9 (0.52)	0.48

Where small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively. SE refers to standard error.

Table 5: Ranked means (SE) of pork consumers by income levels (1=Mostly consume pork; 3=Least consume pork)

	Pork retailer category			
Income level	Small (<5kg/day)	Medium (5-10kg/day)	Large (>10kg/day)	P-value
Better	1.3 (0.10)	1.8 (0.17)	1.4 (0.18)	0.03
Medium	1.9 (0.10)	2.0 (0.26)	1.8 (0.16)	0.54
Low	2.9 (0.10)	3.0 (0.00)	3.0 (0.01)	0.64

Where small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively. SE refers to standard error.

The difference in pork consumption by age group was not significant (P>0.05) across the three scales of retailers. This indicates that most youths were not influenced by religion and cultural taboos to stop eating pork and pork products in the country.

The study also found that pork consumption was not influenced by gender (Table 2). This was true across the three scales of retailers. However, Fortomaris *et al*. [5] reported that age and gender of pork consumers in Greece and Cyprus influenced pork consumption and preference for quality traits. For instance, there was gender difference for preferring pork with dark red or light red color.

In Ethiopia, pork was mostly consumed by Protestant and Catholic religion followers (Table 3). This was true across the three retailer groups. Small and medium scale pork retailers responded that Protestant religion followers were their main customers of pork (1st ranked customers); whereas, according to large scale pork retailers, Catholic religion followers were ranked as their primary (1st) pork customers. The customers rank distribution by religion was not significant (P>0.05) across the three retailer groups. These findings agrees with Font-i-Furnols and Guerrero [4] who stated that meat and meat products' consumption depends on socio-economic, religious and traditional factors.

As indicated in Table 4, Asians followed by Europeans were the two most important pork consumers in Ethiopia. Among the five considered nationalities, Ethiopians were the 3rd ranked pork consumers in the study areas. These indicate that as a consumer, Asians and Europeans were playing important roles for existence of pork marketing in Ethiopia. The results of the study further indicate that pork is becoming the food of Ethiopians too. However, those Ethiopians eating pork and pork products are those diasporas and are few in number which don't represent the majority of the country's population. The contribution of other African and American citizens for pork marketing in the study areas had lower rank. This agrees with the report of FAOSTAT [20] which stated that pork consumption can vary among and within countries.

In Ethiopia, pork was consumed mostly by people who had better income. As indicated in Table 5, people with better income were ranked 1st as pork consumers which was significant (P<0.05) across the three scales of retailers. The degree of pork consumption showed an increment as level of income increased. The possible explanations for the question "*Why those people who had low income level did not consume pork as compared to medium and better income level groups*?" can be explained by the fact that pork was available in supermarkets mainly in the form of processed products such as mortadella, salami and sausage which were unaffordable for low income groups to buy and use those products. Processing or value adding made the supermarket pork products a bit expensive. Even though pork was consumed mostly by better income groups in Ethiopia, according to FAOSTAT [20], pork is the least consumed as a whole in Africa (1.4kg/capita/year) as compared to other meat types such as beef, mutton and chicken. On the other hand, pork and poultry meat are the major consumed meat types in Europe, Asia and in Latin America. Moreover, the report of FAOSTAT [20], revealed that pork is the most globally consumed (15.8 kg/capita/year), followed by poultry (13.6 kg/capita/year), beef (9.6 kg/capita/year) and sheep & goat meat (1.9 kg/capita/year).

Seasonality of Pork Consumption: This study assessed if pork consumption in Ethiopia was affected by season. As can be seen in Figure 1, approximately, 83.8% of pork retailers at supermarkets agree that neither pork marketing nor consumption was season dependent. Only 16.2% of retailers replied that pork consumption was season dependent. This can be due to fasting as some people who consume pork will not eat pork during fasting time. Similarly, according to Phuong *et al*. [21], pork marketing is season dependent in Vietnam. Font-i-Furnols and Guerrero [4] further reported that states, consumer attitudes and beliefs about meat and meat products depend on the product itself and on the characteristics of the individual. Moreover, Ivan and Penev [22] stated that beliefs are experiences or acquired knowledge and the personal characteristics that determine consumer attitudes, buying intentions and preferences.

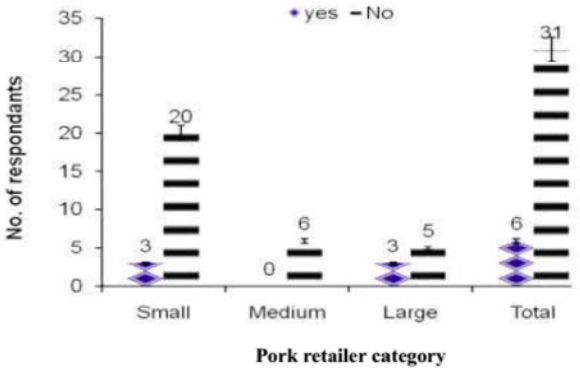

Fig. 1: Seasonality of pork consumption
Where small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10 kg/day and > 10kg/day of pork, respectively.

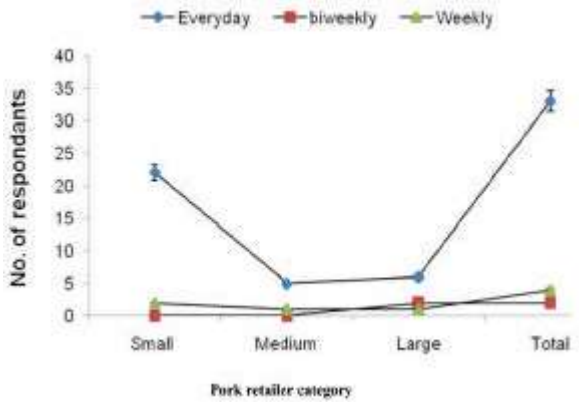

Fig. 2: Frequency of consumers' supermarkets visit to buy pork
Where small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively.

Frequency of Pork Purchase: This study assessed how frequently the pork consumers visited supermarkets for buying pork and pork products. According to the interviewed pork retailers at supermarkets, most of the pork consumers visited supermarkets daily for the purpose of buying pork and pork products (Fig.2). This was true across the three retailers categories. However, the volume of pork they usually buy was very small (few kilos/day). As shown in Figure 2, consumers' visit to supermarkets had similar pattern showing a daily, weekly and biweekly frequency of visit for buying pork, however, in case of large scale retailers, the observed pattern was daily, biweekly and weekly. This indicates that pork has a regular demand in Ethiopia but the amount of pork sold per day per supermarket was too small.

Preferences for Pork Quality Traits: Consumers' preference for pork quality traits such as color, freshness, leanness and tenderness might affect volume of pork demand and its market price [10, 12]. Meat consumers use color as an intrinsic cue to predict sensory quality [23]. Color has been reported to be one of the most important fresh meat characteristics at the point of purchase [24].

In this study, consumers' preference for the various pork quality traits was indirectly assessed by interviewing retailers at supermarkets. According to the retailers response, pork consumers in Ethiopia highly give high value for leanness, freshness and quality assurance (Table 6). However, none of the consumers' preferences for various pork quality traits were significant (P>0.05) across the three scales of retailers. In agreement to our findings, Ngapo *et al*. [25] reported that lean pork is generally preferred than fatty pork, however, in countries like Japan and South Korea, fatty pork is more or equally preferred to lean pork.

Table 6: Ranked means (SE) of pork consumers' preferences for pork quality traits (1= Highly preferred trait; 7= Least preferred trait)

	Pork retailer category			
Quality parameter	Small (<5kg/day)	Medium (5-10kg/day)	Large (>10kg/day)	P-value
Color	3.5 (0.19)	3.6 (0.40)	3.5 (0.38)	0.98
freshness	1.6 (0.15)	1.2 (0.17)	1.4 (0.26)	0.24
Packing style	4.2 (0.29)	4.2 (0.54)	4.6 (0.26)	0.83
Quality assurance	2.9 (0.30)	3.2 (0.54)	3.2 (0.41)	0.82
leanness	1.3 (0.10)	1.0 (0.00)	1.6 (0.26)	0.12
tenderness	4.2 (0.26)	4.2 (0.78)	4.1 (0.13)	0.92

Where small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively. SE refers to standard error

Table 7: Reasons associated with pork eating

	Pork retailer category				
Reasons	Small (<5kg/day)	Medium (5-10Kg/day)	Large (>10 Kg/day)	Total	P value
To get fat	10 (55.6)	2 (11.1)	6 (33.3)	18	0.07
To be protected from evil eye	0 (0.0)	1 (100)	0 (0.0)	1	0.36
Both	8 (66.7)	2 (16.7)	2 (16.7)	12	0.049
Total	18	5	8	31	

Where numbers outside and inside parenthesis represent the number of respondents and their percentage from row totals, respectively. Small, medium and large scale refers to those supermarkets sold <5kg/day, 5-10kg/day and >10kg/day of pork, respectively.

Regarding quality assurance, similar findings were reported by Font-i-Furnols and Guerrero [4] who stated that certification is an important attribute that can affect consumers' preferences for pork. Moreover, some people have a negative image mainly due to its association with the living animals, handling practices and slaughter conditions [26]. Implementation of improved measures for food safety, health management and environment issues and practicing organic production can generally increase consumer preference for food products [27].

Reasons Associated with Pork Consumption: Consumers' acceptability of meat types for consumption depends on their culture, experience or consumption habits [4]. Out study revealed that people were eating pork for different reasons rather than for its value as food. This is not common for other meat types such as beef, mutton and chicken where they are commonly eaten by consumers for their food values. About 92% of pork retailers that were interviewed at supermarkets responded that some of their customers were eating pork for special reasons than eating it as food value. As indicated in Table 7, approximately 58.1% of pork customers in Ethiopia eat pork purposely to get fat, whereas, about 38.7% of them use pork for additional reason, i.e. to protect their children from evil eyes. Consumers' expectations on pork consumption can play an important role in the acceptance or rejection of the product. Consumers may alter perception on pork consumption and this might affect the pork market either positively or negatively or [4].

CONCLUSION AND RECOMMENDATIONS

Consumers' pork consumption behavior was affected by several factors among which religion, age, marketing and income variables were the major ones. In Ethiopia, pork was mainly consumed by youth and adult age groups and consumption was not affected by gender. In terms of religion, protestant and Catholics and in terms of nationality, Asians and Europeans were the major pork consumers in the country. Pork was mostly consumed by people who had better income source.

Among the different pork quality traits, leanness and freshness were the two mostly preferred traits; whereas, little attention was given to pork color, packing style and tenderness. Pork consumers in Ethiopia were motivated to consume pork purposely to get fat.

According to our study's findings, pork and pork products' demand and supply were generally low in the country. There were only few locally processed pork products. However, the majority of the pork products found in the supermarkets were those imported products from abroad. There was very poor public awareness on the importance of pork consumption. Furthermore, there were very little efforts made to exploit the swine sector for food security, income generation and towards the country's economy.

Thus, public awareness need to be enhanced to promote market for pork and pork products. There should be urgent interventions towards exploiting the swine sector in the country. The government needs to strengthen research, development and investment in the swine production and product marketing. As late comer advantages, huge experiences on swine production, pork products processing, product diversification, value addition and marketing can be obtained from very well experienced tropical countries like Brazil.

The information generated from this study can be used to enhance public awareness on consumers' preference for different pork quality traits. This will further enable to produce and supply pork and pork products with desirable characteristics satisfying consumers' demand. Moreover, the findings of this study can be used to develop research and development strategies aiming to improve Ethiopian pork marketing system.

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