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Assessing consumer preferences for quality and safety attributes of food in the absence of official standards: the case of beef in Ethiopia

Mohammad A. Jabbar,
8-9 Shantinagar, Dhaka 1217, Bangladesh. Email: MJabbar2@gmail.com

Samuel A. Admassu,
Ethiopian Commodity Exchange, PO Box 20796 Code 1000,
Addis Ababa, Ethiopia. Email: ethsami@yahoo.com

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Samuel A. Admassu,
Ethiopian Commodity Exchange,, Addis Ababa, Ethiopia.
Email: ethsami@yahoo.com

Abstract

Conjoint analysis was applied to asses the part worth of beef quality and safety attributes using a cross sectional data from a stratified sample of 300 households in Addis Ababa city collected in June 2007. Due to the absence of official standards for quality and safety in the domestic market for beef, information on consumer perception on quality and safety attributes were derived from a rapid appraisal. These were then used for defining product profiles in the detailed survey. Results show that, freshness, abattoir stamp, fat content, hygiene of meat shop and staff, and price are significant quality and safety attributes that consumers use, in the order mentioned, in their beef purchase decisions. There are differences in the relative importance of these attributes among income classes. Freshness was most important for low income households while fat content was most important for high income households. Abattoir stamp was less important for low income households but very important for high income households. Hygiene was rated high by the higher income households and low by lower income households. Price was the least important attribute for quality and safety for the entire sample as well as for different income groups. The result of the study could be used for designing safety and quality standard for local wet market and gradually revise such standards as more empirical information on changing consumer demand for quality and safety become available. Further, the consistency of results between the PRA and the detailed survey indicate that carefully designed PRA could be a useful tool for generating information on consumer behaviour and preference in the face of time and resource constraints.

Key words: beef, quality and safety attributes, conjoint analysis

Introduction

Demand for livestock products has been increasing rapidly in the developing countries propelled by income and population growth and urbanization. Increased demand for reliable quality, food safety and scale of delivery has also been observed, especially in urban areas, as evidenced by expanding supermarkets (Reardon et al., 2003). Official standards for quality and safety of food products like meat and milk are either absent or may exist but those might have been defined following developed country norms which can't be enforced. In such situations, consumers and market actors usually use local standards based on certain attributes. Most of the existing literature on demand with a focus on quality and safety deals with developed market (Grunert, 2005) while studies pertinent to local standards and how they are defined and implemented along market chains in developing country markets are scarce. An understanding of which segment of the market prefers which quality and safety attributes and whether they are willing to pay for such attributes is essential for market actors and producers to respond to those preferences. Also understanding these attributes and their price premia may provide a basis for defining local grades and standards and for refining and upgrading any existing standards that are defined on the basis of developed country norms.

In this paper results of a study in Addis Ababa, Ethiopia are presented showing attributes consumers use in differentiating quality and safety of beef, the relative importance of different attributes and their price differentials. In section two, methodology of data collection and analysis are discussed. In section three, results and discussions are presented followed by conclusions.

Methodology

Conjoint analysis

Conjoint analysis has been extensively used by marketing firms to evaluate potential attributes of new products and to determine the optimal mixture of multilevel attributes included in those products (Louviere et al., 2005). Conjoint analysis is derived from Lancaster's theory of demand which posits that the utility an individual derives from consuming a given product is a function of the characteristics of the product (Lancaster, 1971). It is assumed that consumer decision about such a product is based on trade offs among these characteristics. The purpose of conjoint analysis is to estimate utility scores,

called part worth, for the characteristics to show how important each characteristic is to the consumer's overall preference for a product (Louviere et al., 2005). The virtue of conjoint analysis is that it asks the respondents to make choices in the same fashion as the consumer presumably does by trading off between features or attributes (SPSS, 2005).

Conjoint analysis was employed in this study to assess the relative importance of different attributes of beef as perceived by the consumers. For this purpose, it was necessary to create beef profiles composed of selected attributes and attribute levels, and ask respondents to rate, rank or evaluate those product profiles. The attributes are the general characteristics of a product, such as fat content, and attribute levels are specific values of the attribute such as high, low or some specific value of a currency.

Rapid appraisal

In the absence of official standards for beef, information on quality and safety attributes used by consumers in Addis Ababa, Ethiopia were derived from a participatory rapid appraisal (PRA) followed by a detailed survey. The objective of the PRA was to first establish what attributes consumers perceived as important for differentiating quality and safety of beef during their regular purchases and what was their willingness to pay for those attributes. Questions on safety perceptions related to events like outbreak of major diseases e.g. BSE or FMD were not asked. About 200 consumers covering different income levels and socio-economic characteristics were briefly interviewed at random at their residences, at butcher shops, eating places and supermarkets.

The majority of the respondents considered fat content and freshness as the most important quality attributes, and hygiene of sales outlet and staff, and stamp from the abattoir as the most important safety attributes of beef. Price was perceived as primarily an attribute of quality though some perceived it representing safety as well.

The implication of fat content as a quality attribute differed depending on preferences. Some said fatty meat was of high quality while others said low fat red colour meat was great. Consequently there was a difference in quality perception about different parts of the same carcass. The implication of fat content also varied depending on the purpose for which the meat was utilized. Red, tender and lean beef was preferred for making *Kitfo* (minced beef), beef with gristles was preferred for making *wot* (sauce) and red coloured meat with some fat was preferred for *Tibs* (fried meat).

In Addis Ababa, warm or freshly slaughtered meat is not usually sold in butcher shops because slaughtering animals outside abattoir is prohibited except on certain festival days. Abattoirs deliver chilled meat to butcher shops, some of which may have refrigerators, others may not. Therefore, the respondents perceived freshness in terms of shelf life of chilled beef and most of them felt that quality (and some also mentioned safety) of meat deteriorated after one or two days on the shelf.

Presence of tape worm on meat was the most important safety concern especially when the beef was eaten raw, which is a norm in Ethiopia. However, meat with official stamp of the abattoir was considered safer as it served as evidence about health of the animal immediately before slaughtering. Beef with abattoir stamp was perceived as having no or low chances of tape worm infestation.

Respondents considered cleanliness of the butcher and butcher shop as important for safety as butchers usually kept their meat without cover exposing to dust and flies. Meat sold in super markets was considered safer than that from the butcher shops primarily because of differences in cleanliness.

Most of the respondents felt price was not a strong indicator of quality while some respondents said that most of the time quality meat was a bit expensive, so price could be taken as an indicator for quality. Some butcher shops had high sales turn over even at high prices and their meat quality was very high and the premises and staff were clean. Some consumers travelled long distances to buy beef from such shops.

Most of the respondents expressed willingness to pay 10-15% more on the prevailing price of Birr 34/kg for beef of higher quality and free from tape worm.

Thus, perceptions of Addis Ababa consumers represented both objective and subjective dimensions of quality as described in the literature (Grunert, 2005). Objective quality refers to the physical characteristics e.g. fat content built into the product. Subjective quality is the quality as perceived by consumers, which is viewed from two approaches (a) the holistic approach, which equates quality with all the desirable properties a product is perceived to have, (b) the excellence approach, which suggests that products can have desirable properties that consumers, in their own language, may not view as part of quality due to lack of awareness e.g. status of growth hormone (Olsen, 2002).

It follows from the holistic approach that food safety is part of food quality, at least to the extent that consumers believe food safety to be a desirable property. However, qualitative studies on food quality perception suggest that safety may not be uppermost in

consumers' minds when they are asked to describe their own view of food quality (Brunso et al., 2002). This may imply that perceptions of food safety affect consumer food choice in ways that are different from perceptions of the other dimensions of quality. Most of the consumers consulted during the PRA mentioned quality and safety attributes separately but in some cases there was some overlap between the two so that an attribute primarily representing quality also had certain safety dimension and similar was the case for attributes primarily representing safety. For example, fresh beef was considered better quality because it was safer, or a clean butcher shop sold safer beef which was also of better quality.

The respondents were not asked about safety perceptions related to major diseases like BSE nor did they mention anything about it perhaps because these are not yet major problems in Ethiopia. Such safety considerations do not enter quality perceptions under normal circumstances but can create large negative effect on the market at the time of crisis (Burton et al., 2001; Grunert et al., 2003).

In short, the relationship between the objective and the subjective dimensions is at the core of the economic importance of quality. It is only when producers can translate consumer wishes into physical product characteristics, and only when consumers can then infer desired qualities from the way the product has been built that quality will be a factor for competition among food producers (Grunert, 2005). The PRA has revealed that even in the absence of scientifically based official standards, consumers have ways to identify quality and safety attributes of beef. During the PRA, the relative importance of the different attributes could not be established.

Detailed survey

A survey was conducted among representative consumer households in Addis Ababa to collect information on ratings of selected beef profiles developed on the basis of five attributes identified as important during the PRA. For each of the five attributes, appropriate discrete levels were defined as follows: fat content (high, low), freshness (fresh, not fresh), hygiene of staff and premise (clean, unclean), official stamp of abattoir (present, absent) and price per kg (28 birr, 34 Birr, 38 birr)). Rating of preference for a profile was defined on a scale of 1-10, where 10 meant the most preferred profile and 1 the least preferred.

Ranking a large number profiles from a full factorial design would be difficult for respondents so the orthogonal design of SPSS conjoint procedure was employed to select

12 profiles out of all the possible combinations – eight as part of the design and 4 as holdouts. A conjoint card was prepared for each profile that depicted pictorial representation with colour pictures of the various levels of the attributes. This procedure facilitated easy transfer of the ideas of each profile for explanation to the respondents which in turn improved the quality of the data collected.

Sampling and data collection

A multistage stratified random sampling method was used for sampling households. Addis Ababa is divided into 183 *Kebeles* (villages). According to the Central Statistics Authority, 82, 57 and 6 *kebeles* were respectively dominated by low, medium and high income households. Of these, six low income, 4 medium and 2 high income *kebeles* were selected randomly from the respective group. *Kebeles* with mixed income levels were left out. Then 25 households were selected from each *Kebele* using systematic sampling procedure whereby an initial point was chosen, then households were selected at regular intervals. It gave a total of 300 sample households, which was assumed to be large enough to obtain reliable estimate. Sample size of 300-500 is typical in commercial conjoint studies (Cattink and Wittink, 1982). Data were collected in June 2007.

Results and Discussion

Estimated part worth of attributes

Estimated part worth of selected quality and safety attributes appear to be statistically reliable as both Pearson's R and Kendall's tau statistics are highly significant at a probability of less than 1% (Table 1). Estimated number of reversals is relatively small except for price.

The part worth of fat content indicates that high fat content in beef gave lower utility than low fat content. The relative dislike for high fat beef was higher among higher income households perhaps because beef was among the few sources from where the poor got fat, the high income households could consume fat from a variety of sources and hence were much more sensitive to the fat content in beef due to health reasons, such as high cholesterol.

The part worth of freshness shows that the utility derived from purchase of fresh beef declined as income level increased. Some high income households bought food including beef infrequently compared to poor households (Table 2). Over half the rich bought beef from supermarkets where it was kept frozen and those who bought fresh beef from

butcher shops might also preserve at home in fridges while the low income households bought from ordinary butchers frequently for consumption on the same day. As butchers did not have mechanism to preserve beef for longer period in fresh form, their buyers, who were mostly low income, demanded it to be fresh.

Table 1 Part worth of beef quality and safety attributes by income group

Attributes and levels		Total Sample		Low income group		Medium income group		High income group	
		Utility Estimate	Std. Error	Utility Estimate	Std. Error	Utility Estimate	Std. Error	Utility Estimate	Std. Error
Fat content	Low	0.60	0.27	0.35	0.14	0.62	0.30	0.83	0.40
	High	-0.60	0.27	-0.35	0.14	-0.62	0.30	-0.83	0.40
Freshness	Non fresh	-1.02	0.33	-1.20	0.17	-0.97	0.36	-0.90	0.49
	Fresh	1.02	0.33	1.20	0.17	0.97	0.36	0.90	0.49
Abattoir Stamp	Absent	-1.04	0.22	-0.89	0.11	-1.07	0.24	-1.17	0.33
	Present	1.04	0.22	0.89	0.11	1.07	0.24	1.17	0.33
Hygiene of premise and staff	Unclean	-1.12	0.32	-0.86	0.16	-1.14	0.35	-1.49	0.47
	Clean	1.12	0.32	0.86	0.16	1.14	0.35	1.49	0.47
Price/kg	Low (28)	-0.10	0.37	0.12	0.19	-0.12	0.41	-0.34	0.55
	Medium (34)	0.00	0.00	.000	0.00	0.00	0.00	0.00	0.00
	High(38)	0.10	0.37	-0.12	0.19	0.12	0.41	0.34	0.55
(Constant)		4.48	0.32	4.627	0.16	4.49	0.35	4.20	0.47
Pearson's R		0.99***		.99***		.99***		.99***	
Kendall's tau		0.93***		.93***		.93***		.93***	
Kendall's tau for holdouts		0.33		.33		.33		.33	

*** Significant at 1% level.

Table 2 Frequency of purchasing food items for consumption by income group

	% Total sample	% Low income hh	% Medium income hh	% High income hh
Daily	2	3	1	2
3-4 times a week	4	4	4	6
Twice weekly	13	10	14	12
Once weekly	26	14	28	38
As necessary	55	69	53	42
Total	100	100	100	100

The part worth of official stamp indicates that consumers derived higher utility from buying beef with a stamp of the abattoir on the carcass. High income groups were relatively more sensitive to the presence of official stamp because low income households consumed small quantities of meat mostly in a cooked form, so might not

worry too much about presence of tape worm while the higher income households consumed larger quantities in a variety of forms including eating raw. The absence of official stamp was regarded as lack of assurance for disease freeness or safety of the meat rendering reduced utility.

The part worth for hygiene of premise and staff indicates that consumers derived higher utility from buying beef from cleaner butcher shop and sales staff and high income households were more sensitive to this attribute. This might be the reason for higher proportion of high income households buying beef from supermarkets. Overall 14% of households bought beef from supermarkets but, respectively zero, 11 and 54% of low, medium and high income households did so during the month prior to the survey.

The part worth of price is low with high standard error which indicates that price was not an important attribute of quality and safety, which is consistent with the finding during the PRA discussed earlier. However the positive sign of the coefficient indicates that for some consumers high price was an indicator of quality perhaps because such consumers were nor able to adequately judge quality from observed physical conditions at the time of purchase, so they tended to believe that price differential was merely due to quality differential.

Among the sample households, 48% believed that the beef they purchased during the month prior to the survey was safe and 45% believed it was of good quality. Like the PRA, although quality and safety criteria were mentioned separately by most sample households, in some cases there was some overlap between the two so that an attribute primarily representing quality also had certain safety dimension and vice versa. About 64% of the sample households expressed willingness to pay for quality and safety enhancements indicating that there was a gap between what they expected and what was available in the market (Table 3). Proportion of household satisfied with quality and safety of their recent purchase of beef and willingness to pay for better quality and safety enhancements increased as income level increased. This again indicates the existence of demand gap for quality and safety between consumers, higher income groups being a niche market.

Assuming that utility from different attributes is additive, the results in Table 1 was used to estimate the total utility for each of the 12 beef profiles. It was found that the profile with the highest total utility, i.e, the most preferred profile of beef, was fresh beef with low fat content having official stamp of abattoir sold at a clean outlet by clean staff at the highest price. And the least preferred profile of beef was nonfresh beef with low fat

content without stamp of the abattoir sold at an unclean outlet by unclean staff at the highest price. Other profiles were ranked in between these two extremes.

Table 3 Perception and willingness to pay for quality and safety enhancements

Perception on recently purchased beef	Percentage of households saying yes			
	Total sample	Low income	Medium income	High income
Safe	48	42	49	58
Good quality	45	39	44	54
WTP for improvements on beef				
Safe	64	53	63	81
Good quality	64	51	64	83

Relative importance of attributes

For the total sample, freshness was the most important attribute in buying decisions of the consumers followed in descending order by hygiene of shop and personnel, stamp from abattoir, price and fat content (Table 4). But higher income households gave hygiene the highest weight while low income households gave highest weight on freshness. For middle income households, freshness and hygiene were equally important. Overall, freshness - primarily a quality attribute, and hygiene- primarily a safety attribute, were given higher and almost equal weight. Other quality and safety attributes –abattoir stamp, price and fat content- were given somewhat lower but almost equal weight.

Table 4 Relative importance values of quality and safety attributes

Attribute	Entire sample (%)	Low income group (%)	Medium income group (%)	High income group (%)
Freshness	23.5	26.0	23.1	21.1
Hygiene	23.4	20.1	23.8	27.5
Stamp	18.9	18.4	18.8	20.2
Price	17.6	18.9	17.5	16.0
Fat content	16.6	16.7	16.9	15.2
Total	100.0	100.0	100.0	100.0

This ordering, especially the least weight given to fat content in purchase decision, is contrary to common belief that Ethiopian consumers have strong preference for high fat beef. However, this might have arisen due to preparation of beef profiles without regard to specific cut and form of consumption. Among the sample households, 80% bought beef in the previous month of the survey to make *wot*, 40% for making *tibs*, 13% for

making *kitfo*, and others for a combination of purposes. So in reality, when overall beef consumption is considered, preference for high fat content might not be high but for a specific cut of beef for a specific form of consumption, for example, raw beef consumption, high fat might still be preferred, which was not separately captured in the beef profiles.

Summary and conclusions

There are no official grades and standards for beef in the domestic market in Ethiopia. A participatory rapid appraisal (PRA) among consumers in Addis Ababa, the capital, revealed that consumers differentiated quality and safety of beef on the basis of fat content, freshness, hygiene of sales outlet and staff, abattoir stamp and price, and they had specific preferences for beef based on these attributes. These attributes represented both objective and subjective dimensions of quality, and consumers also considered safety as part of quality as assumed under the holistic approach to quality assessment.

A detailed survey was conducted in June 2007 among 300 households selected through a multi-stage stratified sampling procedure to collect information on consumer preference for beef quality and safety attributes. Conjoint procedure in SPSS 15 was used for product profile design and analysis of data. Beef profiles were defined by using the five important attributes identified during the PRA.

Results of the survey show that among the quality and safety attributes, consumers gave weight to freshness, hygiene of sales outlet and personnel, abattoir stamp, fat content, and price in that order. Freshness was most important for low income households while fat content was most important for high income households. Abattoir stamp was less important for low income households but very important for high income households. Hygiene was rated high by the higher income households and low by lower income households. Price was the least important attribute for quality and safety for the entire sample as well as for different income groups.

Thus the following recommendations can be made on the basis of the study results:

- Food quality and safety should be considered as a major topic for public policy. Formulation of common standards for food quality and safety, which can't be enforced and has no immediate impact on consumer food choice, should be avoided. Instead, assuming consumer preferences to be heterogeneous and

conditioned by level of socio-economic development, efforts should be made to provide transparency, education and information and encourage consumers to form their own judgments on food quality and safety.

- It is advisable to formulate quality and safety standards for beef suitable for domestic market based on the attributes currently used by consumers and market actors. This will be a legal basis for sellers to substantiate their price differences and it will encourage producers to produce cattle to respond to market demand. Such standards will also help better public health management of abattoirs and butcher shops..
- More systematic studies should be conducted on demand for quality and safety in food commodities in order to develop consistent locally suitable grades and standards and update them continuously to suit changing economic conditions. Capturing consumer perception and interpreting them requires careful consideration and use of appropriate techniques. The results of the PRA and statistical analyses of formal survey data showed that these were complementary methods in the given context. So when time and resources are limited, carefully conducted PRA is a robust technique to assess consumer preferences for food quality and safety attributes.

References

Bredahl, L. (2001) Determinants of consumer attitudes and purchase intentions with regard to genetically modified foods: results of a cross-national survey. *Journal of Consumer Policy* 24: 23–61.

Brunso, K, Fjord, T A and Grunert, K G (2002) Consumers' food choice and quality perception. MAPP working paper 77, Aarhus School of Business, Denmark.

Burton, M, Rigby, D, Young, T and James, S. (2001) Consumer attitudes to genetically modified organisms in food in the UK. *European Review of Agricultural Economics* 28: 479–498.

Cattin, P and Wittink, D R. (1982) Commercial use of conjoint Analysis: A survey. *Journal of Marketing* 46: 44-53.

Grunert, K G, Bredahl, L and Scholderer, J. (2003) Four questions on European consumers' attitudes to the use of generic modification in food production. *Innovative Food Science and Emerging Technologies* 4: 435–445.

Grunert, K G. (2005) Food quality and safety: consumer perception and demand. *European Review of Agricultural Economics* 32 (3):369–391.

Lancaster, K. (1971) Consumer Demand: A New Approach, New York: Columbia University Press.

Louviere, J J, Eagle, T C, and Cohen SH. (2005) Conjoint Analysis: Methods, Myths and Much More, Working paper No. 05-001.

Nielsen, N A, Bech-Larsen, T and Grunert, K G. (1998) Consumer purchase motives and product perceptions: a laddering study on vegetable oil in three countries. *Food Quality and Preference* 9: 455–466.

Olsen, S O. (2002) Comparative evaluation of the relationship between quality, satisfaction, and repurchase loyalty. *Journal of the Academy of Marketing Science* 30: 240–249.

Reardon, T, Timmer C P, Barret, C B and Berdegue, J. (2003), The rise of supermarkets in Africa, Asia and Latin America. *American Journal of Agricultural Economics*, 85: 1140-46.

SPSS (2005) Syntax Reference Guide, SPSS Inc., USA