Assessment on Economic Support and Value of Hygiene of Butcher shops among Beef Consumers in Tanzania.

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Abstract

The study was conducted to reveal consumer support to hygiene of butcher shop using a linear restriction approach to beef retailers' sales income; and direct evaluation through choice based experiment. The average retailer's sales income as an aggregate consumer expense on beef was realized to be affected by hygienic appearance for building, serving-storage equipment and attendants (p=005). Consumer choice preference to hygiene was positive (p<0.001) and they were willing to pay more for hygiene than the beef intrinsic attributes (p=0.05). It was concluded therefore that consumer expenses and choices for beef is motivated by hygiene. Retailers should be encouraged to improve the hygienic standard of butcher shops as a consumer requests besides abiding to rules and regulations.

Key words: conjoint analysis, consumer, hygiene, income, linear restriction, retailing

1. INTRODUCTION

Retailing is an important market section in beef value chain whereby the aggregate consumer expense on beef starts to be realized through retailer's income. This is due to the general assumption that beef retailer's income is the consumer expenses on beef, and that improving beef retailer's income would nourish the value chain by having positive income effect to other players down the chain including beef cattle farmers.

Most of the factors that influence beef retailer's income from a given outlet such that volume sales, price and location are considered to be subjective to retailer whereby the market and consumer related forces are left to take its own course (Lusk and Cevallos, 2004). Unfortunately, the quality of an outlet such that of butcher shop which accounts and considered as hygienic signal to consumer is mandatory under appropriate authorities in many countries including Tanzania whereby the Tanzania Food and Drugs Authority (TFDA) is a responsible authority (URT 2006a; URT 2006b; Chanda *et al*. 2010).

Hence, the effort to adhere and improving quality of butcher shop is largely based on authoritative penalties such as denial of quality compliance certificate which ultimately ends up to non-launching or closing of business if it was operating (Al-Kandari & Jukes 2012). This approach is relatively difficult to work in most developing countries due to various problems such as the out-rich and capacity limitation of quality enforcements authorities among others (Nguz 2007; Chanda *et al*. 2010; Haileselassie *et al*. 2012).

Under these circumstances, improving quality of butcher shop which requires substantial capital investments will be less emphasized and probably ignored by retailers themselves unless they realize joint support from consumers that brings some economic benefit out of such investment. Economic effect persuasion based on retailers' sales income may serve the purpose to reduce the fear of risk taking on capital investments to improve the butcher shops infrastructures and indirectly reflect the support of beef consumers who are the main clients as compare to the authoritative official's orders.

According to Dawnay and Shah (2005), consumer behaviour had relatively more reflection to direct support for attributes of importance than solely relying on neoclassical economic assumption of "rational consumer". Fulfilment of authoritative demand for butcher shops being at relatively more hygienic appearance is important but its outcome might depend on consumer behavioural support with respect to extent of valuing hygiene among other attributes. While beef and related market in developed world has substantial understand to consumer behaviour there is relatively little information to the same, and in addition to possible consumer contribution to the

enforcement of rules and regulation governing hygienic retailing of beef in developing countries (Jabbar *et al*. 2010).

In Tanzania for instance, lack of information on quality of butcher shop and retailer's sales income (Mtenga *et al*. 2000; BACAS 2009) is one of the limiting factors towards motivating hygienic quality improvement of butcher shops based on economic influences. In addition, consumer preference and willingness to pay (WTP) for beef sold under hygiene environment is not clearly known. Therefore the aim of this paper was to examine the influence of hygienic quality of butcher shop based on retailers' sales income as an indirect support of consumers, and directly assess consumer's utility/satisfaction and WTP for hygiene with respect to beef product attributes such as chilling (freshness), tenderness, and adipose fat content (leanness).

2 MATERIALS AND METHODS

This study was conducted in Mbeya City, Iringa Municipal, Tunduma and Mafinga townships as potential business centres in Southern Highlands Regions of Tanzania.

2.1 Survey method and sampling procedure
Butcher shop survey was done at two stages using a structured questionnaire and personal observation (BACAS 2009; Garayoa *et al*. 2010). All butchers were surveyed to collect data on location (in relation to market centres), ownership status, business timeframe, timeframe and other demographic information of butcher owners and operators. Butcher quality grading was done using quality assessment format derived from TFDA (Table 1) for main attributes of building, working facilities and attendants which were included in the questionnaire. The purposive sampling of butcher shops was later done to butcher shops with appreciable daily sales income records from 1st October to 30th January 2011.

Consumer preference data collection was done through a series of repeated hypothetical and real choice based experiments (CBE) as it mimic the actual situation in market. CBE was orthogonally and randomly designed according to Hensher *et al*. (2005), whereby hygiene of retailing outlet was jointly analysed with beef chilling, tenderness, adipose fat content and price attributes (Table 2). In real choices each consumer was obligated to purchase one among ten choices made in ten choice scenarios (Alfenes *et al*. 2006).

2.2 Data analysis and test statistics
TFDA's butcher specific quality attributes were scored and graded against the appropriate main quality attributes for descriptive analysis (Table 1). Linear restriction model approach was used in analysing butcher shop survey data (Greene 2003). Choice data were analysed using random effect logistic regression model in STATA 12 whereby the coefficients obtained were then used to determine the WTP as partial derivative of utility function with respect to price (Hole 2007; Hole 2008).

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Table 1: Butcher shop hygiene grading form*

Main hygiene attribute		Specific hygiene attributes in question	Marks (%)	Hygiene standard
A. Building structure and environment	1	The building should be permanently constructed with not less the 3 m length and 2.5 m width.	10	$\bar{X}_A \leq 50\%$ Below standard;
	2	The floor should be tough with no crakes.	10	
	3	The inside walls should be tiled at not less than 1.2m from the floor. The remaining part should be furnished with white colour	10	
	4	The outside walls should be furnished with white colour	10	$60\% \leq \bar{X}_A \leq 80\%$; Intermediate
	5	Presence of wide glass window.	10	
	6	Presence of white seiling roof	10	
	7	Presence entrance door which is both dusts and insect proof	10	$90\% \leq \bar{X}_A \leq 100\%$; Standard
	8	Presence of water sink for through washing of serving tools	10	
	9	Presence of toilet for attendants	10	
	10	Presence of electric fan or air condition	10	
		Subtotal	100	
B. Working Personnel's	1	Attendants should be healthy checked and approved to serve	50	$\bar{x}_B = 100\%$; Standard
	2	Each attendant should have two pair of protecting gears include white tetron apron which should be always clean	50	$\bar{x}_B < 100\%$; Below standard
		Sub-total	100	
C. Working utensils	1	Presence of adequate handle-cutting facilities such as knives	25	$\bar{X}_C \leq 50\%$; Below standard
	2	Presence of electrical beef cutting saws instead of tree logs	25	
	3	Carcass should be hanged using appropriate hooks	25	$75\% \leq \bar{X}_C \leq 90\%$; Intermediate
	4	Presence of working refrigerator for storage of unsold beef	25	
		Subtotal	100	$\bar{X}_C = 100\%$; Standard

*Derived from Tanzania Food and Drugs Authority (TFDA) Pre-requisites for butcher shops

Table 2: Choice alternative with attribute and attribute levels

Attributes	Choice alternatives with attributes levels		
	Local Non-finished	Local finished	Crossbred finished
1. chilling	Chilled	Chilled	Chilled
	Not Chilled	Not Chilled	Not Chilled
2. Adipose fat content	Medium	Medium	Low
	High	High	Medium
3. Tenderness	Low	Medium	Medium
	Medium	High	High
4. Hygiene of retailing outlet	Clean	Clean	Clean
	Not clean	Not clean	Not clean
5. *Price in Tshs/kg	4500	5000	6000
	5000	5500	6500

*Tshs 1500 = US D 1

3.0 Results

All butcher shops in the study area (296) were surveyed for quality assessment and geo referencing. 19 public market centres were identified and used as reference points for comparative location aspect. About 25% of butcher shops met requirements for building structure while 98% were below standard for serving-storage equipments (Table 3). Ironically, none of the butcher shop met TFDA standard for all components.

Table 3: Quality of butcher shops (n=296)

| | Quality of butcher shop | | | |
| | Below standard | | Standard | |
Main attribute	(%)	Intermediate (%)	(%)	Total
Building structure	27.03	48.31	24.66	100.00
Serving-storage equipments	98.00	1.70	0.30	100.00
*Butcher attendants	42.23	-	57.77	100.00

* Had two levels only

64% of butcher shops were involved in retailer's daily sales income assessment whereby the average daily sales income was Tshs 249 000 which also differs within specific quality variables (Table 4). The residual sum of squares was disturbed in restricted model by removing hygiene attributes resulted into higher formulated F-value (Table 5).

Table 4: Comparable daily butcher shop beef sales income per quality attribute

| | Average sales income (Tshs) within hygienic quality component | | |
| | | Serving/storage | |
Quality level	Building and premises	facilities	Attendants
below standard	222 000	242 000	186 000
Intermediate	218 000	478 000	-
Standard	344 000	375 000	310 000
Overall (N=190)	249 000	249 000	249 000

Table 5: Statistical coefficients and significance n=190

| | Unrestricted model | | Restricted model | |
*Model	Coefficients	Sig.	Coefficients	Sig.
Daily average beef volumes (x100kg)	3.627	0.000	3.737	0.000
Location (1 above 100m; 0 Other.)	-0.050	0.253	-0.018	0.763
Business duration (1 > 5 years; 0 Other.)	0.057	0.202	0.181	0.001
Intermediate building (1 Yes; 0 Other.)	-0.056	0.242		
Standard building (1 Yes; 0 otherwise)	0.386	0.000		
Intermediate tools (1 Yes; 0 Other.)	0.536	0.000		
Standard tools (1 Yes; 0 Other.)	1.901	0.000		
Standard attendants (1 Yes; 0 Other.)	0.002	0.966		
R^2	0.971		0.945	
Residual SS	13.485		25.48	
F-Value		40.37		
F-value (tabulated)		2.67		

*Dependent Variable: Average daily sales' income (x100000Tshs)

308 consumers participated in CBE. Utility estimates for hygiene was higher than all attributes except by medium adipose fat in real choice (Table 6) while WTP estimates for hygiene followed the same trend as utility estimates (Table 7).

Table 6: Choice preference estimates n=308

Choice (y)	Hypothetical choice		Real choice	
	Coefficient	P>|z|	Coefficient	P>|z|
Chilling	0.4305	0.000	0.3356	0.000
Medium adipose fat	0.4195	0.000	0.4232	0.000
High adipose fat	-0.1172	0.178	-0.0660	0.457
Medium tender	0.2290	0.002	0.1588	0.002
High tender	0.4443	0.000	0.3702	0.000
Hygiene of retailing outlet	0.7516	0.000	0.4173	0.000
Price (Tshs)	0.0002	0.000	-0.0003	0.000

Table 7: Willingness to pay estimates at 95% confidence interval

Attribute	Hypothetical choice			Real Choice		
	WTP	LB	UB	WTP	LB	UB
Chilling	2518	1080	3954	1058	645	1472
Medium adipose fat	2453	1252	3654	1335	606	2063
High adipose fat	-685	-1928	558	-208	-725	309
Medium tender	1339	64	2614	501	103	899
High tender	2598	620	4576	1168	723	1612
Hygiene of retailing outlet	4395	1994	6797	1316	844	1788

LB, lower boundary; UB, upper boundary

4.0 Discussion

As expected beef retailers conduct their business in butcher shops without complete adherence to rules and regulations governing the construction and operations that ensure favourable hygienic environment which implies that consumers in general purchase beef confronted with non hygienic environment. This is similar to the report by Mtenga *et al*. (2000) and BACAS (2010), indicating an inadequate implementation and supervision of rules and regulations governing healthy and hygiene supply of beef to consumers.

Efforts to improve quality of butcher-shops on the observable specifications currently favours beef retailers economically as their average sales income becomes higher where TFDA standards for buildings-and-premises and serving-storage attributes are attained. The joint analysis of economic influence suggests neither of the hygiene attributes is less important nor all of them including butcher shops attendants have positive influential in earning higher sales income. This suggests that, quality of the butcher shop can boost retailers' sales income as an incentive to and indirect signal that the aggregate consumer expenses on beef are towards butcher shops with acceptable cleanliness level.

Higher part worth and WTP estimates for hygiene is clear indication that consumer choice criteria in practice is primarily on the hygienic environment of the retailing outlet followed by intrinsic product attributes of freshness, tenderness and adipose fat content similarly reported by Bernues *et al*. (2003), suggesting that enormous economic gain in beef retailing can be obtained through the extrinsic quality improvement.

Despite exaggeration made by consumers in hypothetical choice as reflected by overestimation of WTP; utility and WTP estimates place hygiene among the highly competing attributes when it come to real purchase scenario which prop up on the previous observation made in butcher shops survey as possible reason for higher retailer sales income . This is similarly to the attractive reasons for butcher shops embedded in supermarkets (Hobbs *et al*. 2000).

The overall results from butcher shop survey and consumer choice experiments revealed in unison that there is a shift of hygienic and quality of butchers shop from authority to consumer. We observed implementation of rules and regulation governing provision of hygienic beef retailing environment has been left to consumers themselves

whom in their systematic and behavioural practices they act positively thereby bringing both realized and potential economic influences as reflected by high retailer's sales income and higher positive WTP respectively. This is fundamental role of consumers as pointed out by Nguz (2007) but contrary to local policy and act (URT 2006a, URT 2006b) which although have an emphasis on hygienic retailing of beef it does not adequately recognize direct collaboration or involvement of consumers as potential partners in improving quality of butcher shops and thereby hygiene status of the retailing environment for which retailers fail to abide under the compulsory basis.

5.0 Conclusions

Consumers are in positive economic support for hygiene through their systematic and behavioural purchasing practices although butcher shops are currently operated below public standard. Retailers are realizing higher sales' income and have potential for profit making since consumers are willing to pay more shillings if hygiene is guaranteed.

6.0 Recommendations

It is recommended that beef retailers should improve the hygienic quality of their butcher shops as inevitable incentive to capture more buyers and avoiding negative economic consequences apart from usual compliance to public rules and regulations. In addition, the policy should make profound inclusion of consumers as appropriate partner in beef retailing quality assurance. TFDA is urged to work closely with Consumer Consultative Council to increase awareness of the consumers and pursued them to further demand for hygienic beef retailing environment.

7.0 Acknowledgements

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