International Journal of Economics, Commerce and Management
United Kingdom Vol. III, Issue 2, Feb 2015
http://ijecm.co.uk/ ISSN 2348 0386

THE RELATIONSHIP BETWEEN INFORMATION SHARING AND QUALITY MANAGEMENT IN THE SMALL AND MEDIUM BEEF ENTERPRISES IN KENYA

Joyce M. Kibuchi
Jomo Kenyatta University of Agriculture and Technology, Kenya
joycekibuchi@gmail.com

Robert Gichira
Jomo Kenyatta University of Agriculture and Technology, Kenya
grogichira@yahoo.com

Kenneth N. Wanjau
Karatina University, Kenya
k_wanjau@yahoo.com

Abstract
Research on organization economics reports a general trend towards information sharing in food supply chains. Business globalization and efficient communication via Information Technology, have forced food enterprises to turn towards a more cooperative behavior. While this change to cooperative data communication has occurred in other supply chains, it is not common in beef supply chains. Studies have shown that efficient coordination of chain information enables seamless traceability and harmonization of production processes between the various stages of the supply chains. There is substantial evidence documenting the effects of information sharing on SME growth and performance but adequate empirical evidence on the relationship between information sharing and quality management in the beef enterprises is lacking. This study sought to fill this knowledge gap. Simple random sampling was adopted and a semi-structured questionnaire was used to generate data from selected respondents in the beef sector in Kenya. Data was analyzed using structural equation modeling. Results showed a positive relationship between information sharing and quality management. Therefore, enterprises should ensure flow of information for quality products in a competitive global market.

Keywords: Beef enterprises, information, Food Quality Management, Linkages, SMEs

INTRODUCTION

The food industry is a valuable part of the world economy. The beef sector is important as a direct source of protein and iron and a source of income for many producers in low developing countries. However, the sector has experienced repeated disease outbreaks with a consequent rise in buyers' concerns and therefore higher demand for quality and safety assurance. Quality management is at the base of competition between food firms in order to enter global value chains and access exigent markets. As competition moves beyond a single firm to the supply chain, quality management is shifting from internal practices to the integration and assurance of processes spanning customer and suppliers (Ellebrecht, 2012).

Interdependent enterprises have a shared value of information sharing on product and process quality which is a critical factor for quality improvement and competitiveness (Hua, 2006). Rodriques (2007) in his quality organization framework defined Interdependent behaviors of quality originations as having the characteristics of continually gathering information use and exchange, response to customer quality preferences, entrepreneurial management practices such as training and development and risk reduction. Vertically aligned enterprises have a shared value of exchange of information on animal and carcass performance from production to processor (Barnes, 2004) and that bringing business together provides opportunities to share and reduce risks and costs of developing market channels and end markets.

According to the legal requirements, every production stage is only obliged to record product information one step up and one step down, respectively (Han, Trienekens, & Omta, 2011). Empirical studies indicate that primary producers are unwillingness to spend time on data recording and transmission. One reason for the generally reserved willingness to share information across the supply chain may be that there is hardly any incentive to establish transparency (Lie, 2010). On spot markets farmers and livestock dealers but also processors and meat wholesalers sometimes even benefit from the obscure marketing channels since competitive advantages are also achieved by means of opportunistic behavior. All in all, it seems to be difficult to accomplish a sustainable environment for inter-stage communication under the given conditions. If information sharing across non-contractual systems is to be realized, a high level of commitment and trust is required between the business partners (Akhtar, 2013).

The basic systems of quality assurance used in food production are Good Hygienic Practices (GHP), and HACCP (Hazard Analysis and Critical Control Point – the system which includes the area of food health quality assurance and involves the identification of specific hazards throughout the entire process of production of a food product). Implementation of HACCP systems in production plants processing food should be preceded by implementing

principles of Good Production Practice (GPP) and GHP which address issues of plant hygiene and basic food production conditions. To adopt quality management Small and Medium Enterprises (SMEs) rely heavily upon their embedment in a web of partners within the supply chain (Daley, 2009).This study seeks to investigate whether information is shared along the supply chain and what effects this has on quality management practices.

Statement of the problem

The SMEs in the Agri-food industry and in particular the beef sector have played a major role in increasing the Kenyan gross domestic (GDP) and improving international competitiveness (Axelrad, 2006). However, Kenya has been confronted by fierce overseas competitors since the country has entered into free trade agreements with several international trading groups. Study by Pelrine (2009) reveals a poor performance of the Kenyan Beef sector with a slow growth in beef marketing of 3% annually and a scanty meat and meat products export of 0.2- 0.3 percent of the country's export earnings attributable to failure to achieve the global quality standards (Mbwika &Farmer, 2012).

The beef SMEs in Kenya have lacked investment in modern technology and management techniques and there appears to be a need for quality management that benefits from sharing information among the beef enterprises (Otieno, 2011). At present the Kenyan beef sector is characterized by weak vertical linkages where only 3% of the beef sector comprising of the ranchers is vertically aligned to the quality-oriented market, with the rest 97% from nomadic pastoralists relying on middlemen, and targeting the low-end rural consumers (Luig, 2011).

HACCP certification has been used by larger meat processing enterprises but there has been a slow-uptake in the Kenya's beef SMEs (Abong'o, 2008).The country is still far from implementing effective HACCP systems (Martha, 2004) and of the total thirteen licensed local and export meat processors, only two have adopted HACCP quality management system (Mbwika & Farmer, 2012). Inadequate information technology and slow information flow has resulted in inability to control livestock diseases (Foot and Mouth Disease-FMD, Rift Valley Fever –RVF) which has resulted to low consumer trust and a loss of beef export quota of 142 Metric tonnes to the European Union (EU) (RoK, 2010).

There is an extensive literature on quality management in other agro food sectors such as crops (Cuong *et al*.,2011; Baines, 2102; Njenga, 2010), poultry, Dairy (Juncquerra, 2010; Trung, 2013;) and pork (Autora, 2012; Wever, 2010). However, published research on quality management of beef is limited. The need for quality standards such as HACCP in the beef enterprises is well documented (Jenner *et al.,* 2007). There is inadequate empirical evidence on

possible links between information sharing and food quality among the beef enterprises. This is an important knowledge gap, which the present study sought to fill, by assessing the relationship between information sharing and food quality management among the beef processors and producers.

LITERATURE REVIEW

Information Sharing

The information use and exchange include the information change manner between different links, which indicates the form, frequency, adequacy among the key information exchange players and the direction of information flows. The information asymmetry directly affects the quality and safety of food, while it happens quite often in beef chain because the beef chain is quite long. Information is not transmitted fast and accurately, resulting in information asymmetry (Wever, Wognum, Trienekens & Omta, 2010).

In beef chain, the retailer is the closest link to the market and the consumer, while beef cattle producer is the closest to the breeding and producing process. Retailer has the most information about market, price and consumer, while the beef cattle producer has the most information about safety and quality of the breeds. Therefore, the chain actors have the motivation and demand to exchange information. If they can establish a transparent, fluent and accurate chain information exchange system, the information asymmetry will be controlled into the lowest level and safety and quality of the product will be well guaranteed (Autora, 2012).

Transparent, accurate chain information collection and exchange ensures a traceability system which is a tool that contains the information of the whole chain which makes the products be traced from “farm to table” and “table to farm”. It is a food safety system innovation that food operators need to implement in their plants to comply with global general food law. Traceability system is one of the important manners in exchanging information, especially in information of safety and quality (Talib *et al*,2012). Food traceability can be defined as necessary information to describe the production history of a food crop, and any subsequent transformations or processes that the crop might be subject to on its journey from the grower to the consumer's plate. Traceability is part of the food business systems and thus has to be integrated with logistic processes, good manufacturing/agricultural practices (GAP) and food safety programs, such as Hazard Analysis Critical Control Points (HACCP).

Two ways to trace the information of products are “bottom up” and “top down”. “Bottom up” traces the products’ information from raw material supplier to the Point of Sale (POS) in order to check the reasons that could raise safety and quality problems and to check the characteristics and origin of the products. “Top down” means that when the consumers

encounter safety problems of the food in POS, they can trace back to the origin of the food and make sure where the problem exists, this is always used in the reclaim of the products (Autora,2012).Through open information sharing up and down the vertical marketing system can quality improvements be made. Though information collection and sharing is costly, if an individual participant uses information only for his own benefit and not that of the vertical market chain, information sharing is squelched (webber & Labaste, 2010). Study by cook (2005) observed that smallholder beef cattle producers fatten their animals with little or no information regarding market needs which results in loss of sales.

It is imperative that Value Chains must communicate formally and informally. Formal communication could occur through meetings, cluster activities, integrated supply chain systems, industry associations, conferences, and exchanging price information. Informal channels can be created by having a transparent culture within the value chain, especially within the SMEs' supply base. For example, if a farmer sees another farmer in the village benefit from an investment to meet standards or gain a certificate, the second farmer is more likely to upgrade processes based on the observed model (Webber & Labaste, 2010)

Information technology is needed to solve the problems of data collection, transmission and analysis within the beef industry, there must be a common and standardized means of communication, and available to all. Retailers should have information from electronic labels regarding slaughtered animal's microbiological analyses, weights of carcasses after the processing for setting the prices. All the links of the beef chain should have automated or manual software in order to contain information. The information is also transmitted through a consultant, labels and lectures (Canavari, Centonze, Hingley & Spandoni, 2010).

A well aligned value chain will work when vertical partners trust each other. Trust is gained through open information sharing and exchange. Withholding or misrepresenting relevant information that is important to vertical members of the value chain increases distrust and inhibits attainment of a common goal of supplying high quality, safe beef to the world (Jie, Ferry, Parton, Kevin, Cox & Rodney, 2007). Too often in the beef industry information is withheld across vertical segments because incentive asymmetric information provides individual profit opportunities at the expense of someone else.

Study by Jie *et al*., (2007) shows that information flow is essential in a well-coordinated market system. Without clear, transparent, and detailed information flow, improvements at each segment are nearly impossible and the value chain fails to send appropriate information to participants. However, with information sharing also come responsibilities of parties to work together. Organizations should view their information as a strategic asset and ensure that it flows with minimum delay and distortion (Jie *et al*., 2007).

Producers and other firms in the Value Chain need to be motivated to change the way they produce goods and services to meet standards, and they need information to do this. The incentives include shared knowledge of the requirements as well as price points that reflect the additional costs and work involved in meeting requirements. There must also be trust within the value chain that the process is stable. One aspect of creating trust is ensuring that proper information channels are available and being used; these will give the Value Chain actors and producers confidence that they will obtain fair rewards for the costs of implementing new processes to meet standards (Autora, 2012).

Food Quality management

HACCP is a tool to identify and assess hazards and establish control systems that focus on preventive measures rather than relying mainly on end-product testing. It is capable of accommodating change, such as advances in equipment design, processing procedures or technological developments. The system can be applied throughout the food chain from the primary producer to the final consumer and successful application of HACCP requires the full commitment and involvement of management and the workforce (Satin, 2002; Socaciu, UD; Khoi, 2011).

Prerequisite Program for HACCP

HACCP implementation depends on the competence of people who develop and operate it and the prerequisite programmes. Prerequisite programmes may impact on the safety of food; they also are concerned with ensuring that foods are wholesome and suitable for consumption (Rehber, 2012). Formal prerequisite program are increasingly and successfully used to support the implementation of HACCP in food processing (Wallace and William 2001). Some countries have already identified prerequisites. For example, in North America the US Department of Agriculture Food Safety Inspection Service required not only HACCP, but also Good Manufacturing Practice (GMP) and Sanitation Standard Operation Procedures (SSOPs) (NSHA 1997). Similarly, the Food and Drug Administration required HACCP and the prerequisite of GMP as a specific requirement for food production.

As previously mentioned, Kenya currently requires GMP as a prerequisite before HACCP implementation. Pre-requisite programmes such as GAP (Good Agricultural Practices), GMP and GHP (Good Hygiene Practices) must be working effectively within a commodity system before HACCP is applied. If these pre-requisite programmes are not functioning effectively then the introduction of HACCP will be complicated, resulting in a cumbersome, over-documented system.

Maintenance and sanitation practices

a) Pest control

Only authorized pesticides and fertilizers can be used, in compliance with technological and licensing regulations. The pesticides must be kept in a room which is locked and separated from other rooms housing people or animals or used for storing human or animal food, in a way which prevents fire or explosions, and damages to health and the environment (Rehber, 2012).

Pest infestation can occur where there are breeding sites and a supply of food. Good sanitation, inspection of incoming materials and good monitoring can minimize the likelihood of infestation and thereby limit the need for pesticides. To eliminate potential breeding sites and prevent pest access, buildings should be kept in good repair and condition. Holes, drains and other places where pests are likely to gain access should be kept sealed. Wire mesh screens on open windows, doors and ventilation, will reduce the problem of pest entry. Animals should be excluded from the grounds of factories and food processing plants. Potential food sources should be stored in pest-proof containers and stacked above the ground and away from the walls (Ellebrecht, 2012). Establishments and surrounding areas should be regularly examined for evidence of infestation. Pest infestation should be dealt with immediately and without adversely affecting food safety. Treatment with chemicals, physical or biological agents should be carried out without posing a threat to the safety or suitability of food.

b) Facilities

Adequate supply of potable water with appropriate facilities for its storage, distribution and temperature control should be provided to ensure safety of food. Non-potable water for use in fire control, steam production shall have a separate system from the potable water system and shall be well identified. Adequate drainage and waste disposal systems and facilities should be provided. They should be designed and constructed so that the risk of contaminating food or the potable water supply is avoided.

Personal hygiene

Measures need to be in place to ensure that food handlers do not contaminate food. Personal hygiene ensures that those who come directly or indirectly into contact with food are not likely to contaminate food.

a) Health status

People known or suspected to be suffering from, or to be carriers of a disease or illness likely to be transmitted through food, should not be allowed to enter any food handling area if there is a likelihood of their contaminating food. Any person so affected should immediately report illness

or symptoms of illness to the management. Medical examination of a food handler should be carried out if clinically indicated.

b) Personal cleanliness

Food handlers should maintain a high degree of personal cleanliness and where appropriate, wear suitable protective clothing, head covering and footwear. Cuts and wounds where personnel are permitted to continue working should be covered by suitable waterproof dressings. Personnel should always wash their hands when personal cleanliness may affect food safety

c) Personal behavior and visitors

People engaged in food handling activities should refrain from behavior which could result in contamination of food, such as smoking, spitting, chewing or eating, sneezing or coughing over unprotected food. Visitors to food manufacturing, processing or handling areas should, where appropriate wear protective clothing and adhere to the other personal hygiene provisions.

Control of operation

In order to produce food which is safe and suitable for human consumption, it is necessary to formulate design of requirements with respect to raw materials, composition, processing and distribution and also implement, monitor and review the control systems. The control of operation may reduce the risk of unsafe food by taking preventive measures to assure the safety and suitability of food at an appropriate stage controlling the food hazards.

a) Control of food hazards

Food business operators should control food hazards through the use of HACCP system. They should identify any steps in their operations which are critical to the safety of food; implement effective control procedures at those steps; monitor control procedures to ensure their continuing effectiveness and finally review procedures periodically and whenever the operations change (Tekenaka, 2005). These systems should be applied throughout the food chain to ensure food safety throughout the shelf –life of the product through proper product and process design. Control procedures may be simple, such as checking stock rotation, calibrating equipment, or correctly loading refrigerated display units. Sometimes a system based on expert advice and involving documentation may be appropriate.

b) Hygiene control systems

Control of microbial and chemical contamination has to be implemented, such as; cross contamination with pathogens either by direct contact or by food handlers, contact surfaces or the air. Raw, unprocessed food should be separated, either physically or by time, from ready to eat foods with effective intermediate cleaning and disinfection. Access to processing areas may

need to be controlled. Where risks are particularly high, access to processing areas should only be only via a changing facility. Personnel may need to be required to put on clean protective clothing including footwear and wash their hands before entering (Talib, Ali,.& Idris, 2013).

To prevent contamination of foods by foreign bodies no raw materials or ingredient should be accepted by an establishment if it is known to contain parasites, undesirable micro-organisms, pesticides, veterinary drugs or toxic or extraneous substances which would not be reduced to an acceptable level by normal sorting and processing. Raw materials should be inspected and sorted before processing and laboratory tests should be made to ensure safety.

METHODOLOGY

This study adopted a positivism deductive research approach and an objectivism ontology as data collection was based on active involvement of the people within an organizational set up. A descriptive cross-section survey was conducted and data was collected using a semi-structured questionnaire self-administered to beef processors and producers in beef producing Kajiado County in Kenya. Purposive sampling technique was employed to select a sample from 275 beef enterprises.

Sample size of 160 respondents was determined using the cochran's formula for small population (Israel, 2015). All beef processors exporting meat were included in the study. A list of beef enterprises vertically linked to the beef processors was obtained from the beef processing firms and the office of the County director of Kajiado County. Therefore, the units of analysis for this study were the beef producers and processors in Kenya.

The construct of information sharing (ISC) was measured using information attributes (Items; ISC1, ISC2), information flow (Items; ISC3, ISC4, ISC5), and communication mode (Items; ISC6, ISC7). Food quality management (FQM) was measured using the HACCP prerequisites of maintenance and sanitation (Items; QM1, QM2), Personal hygiene and behavior (Items; QM3,QM4) and Control of operations (Item; QM5). These items were measured at 5-point Likert scale ranging from 1= strongly disagree to 5= strongly agree. The normality distribution of the data was confirmed using Skewness and Kurtosis test. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity, and Cronbach alpha test were employed to assess the validity and reliability of the research instrument. A total of 139 questionnaires were returned out of the 160 administered and they were analyzed using the SPSS 21 and an analysis of moment structures (AMOS version 21) was used for structural equation modeling.

Research Hypothesis: Information sharing does not affect food quality management of small and medium enterprises in the beef sector in Kenya.

ANALYSIS

A total of 139 out of the 160 questionnaires administered were returned. 21 firms did not return their questionnaires resulting in a response rate of 87%. Five questionnaires that had at least 10% of the overall questionnaire incomplete were omitted from the preliminary analysis. 10 questionnaires with less than five missing data (4% of overall questionnaires) were imputed using a maximum likelihood function to replace the missing values. Therefore, a total of 134 questionnaires were usable, resulting in an adjusted effective response rate of 84%.

A descriptive analysis reviewed a male dominated enterprise (87%) and only 23% female owned. This may be explained by the cultural inclination that the Maasai community depends on ranching for its livelihood and the beef animal is the reserve for the man.90% of the enterprises owners are aged above 36 years and 57 % have operated the beef enterprise for 20 years and above. 44% of the beef enterprise owners lack basic education. Skewness and Kurtosis ranged between -0.968 to 0.093 and complied with the normality threshold of -1 to +1 (Bordens & Abbott, 2008)

The factorability of items was examined using the Kaiser Meyer- Olkin (KMO), measure of sampling Adequacy, Barlett's Test of Sphericity and communalities. The significance of Barlett test of sphericity supported the suitability of exploratory factor analysis (EFA). For every EFA, it was found that manifest variables have KMO measures of sampling adequacy above 0.767 which is considered good for adequate sample size and a p-value for Bartlet's test of sphericity below 0.5.Communalities for ISC ranged between 0.677-0.807 while FQM ranged between 0.776-0.889 which is well above 0.5 suggesting satisfactory factorability for all items. The reliability of the construct information sharing was measured using cronbach's coefficient α. The coefficient α value of 0.910 confirmed the reliability of the measurement. The information sharing scales items had loadings of 0.639 to 0.887 which is above 0.5 and item to total correlations of 0.635 to 0.809 which is above 0.3.

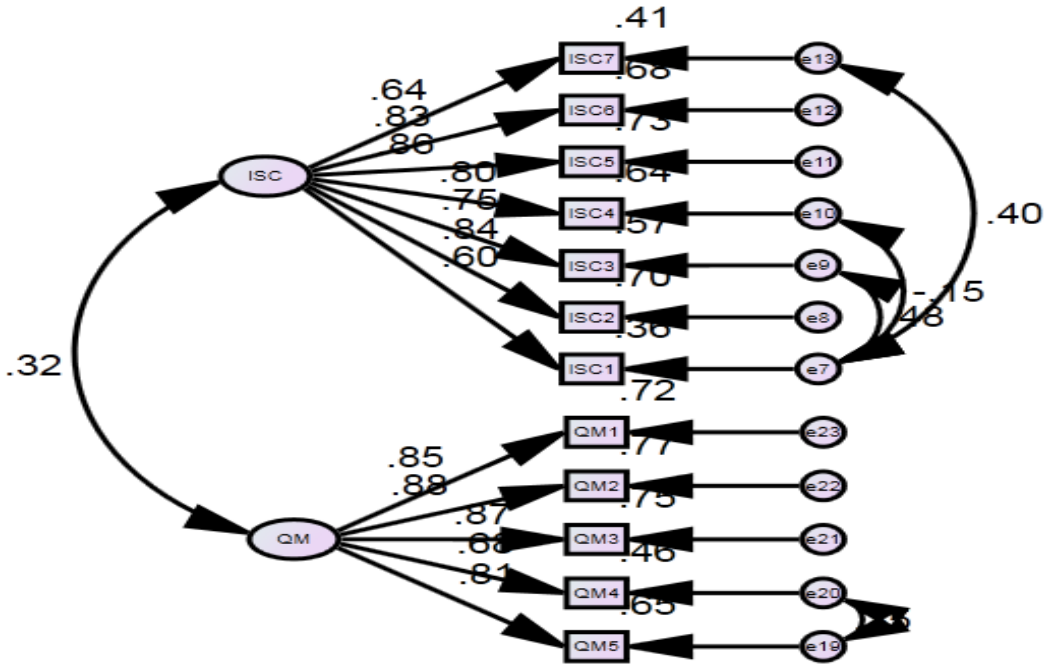
The test model was subjected to a maximum-likelihood confirmatory factor analysis (CFA) using AMOS 21.0 with a minimization of 11 iterations. The chi-square goodness-of-fit statistic (p=0.000) was statistically significant at p<0.001suggesting that the model fitted the data. The first order model demonstrated acceptable fit.

Table 1. Fit Indices for the Model

Model	$\chi 2$	$\chi 2$/df	NFI	TLI	CFI	RMSEA
First-order	143.195	2.922	.902	.891	.962	.074

Note: NFI=normed fit index; TLI=Tucker-Lewis Index; CFI=comparative fit index; RMSEA=root mean square error of approximation.

Figure 1: Measurement model of information sharing and food quality management



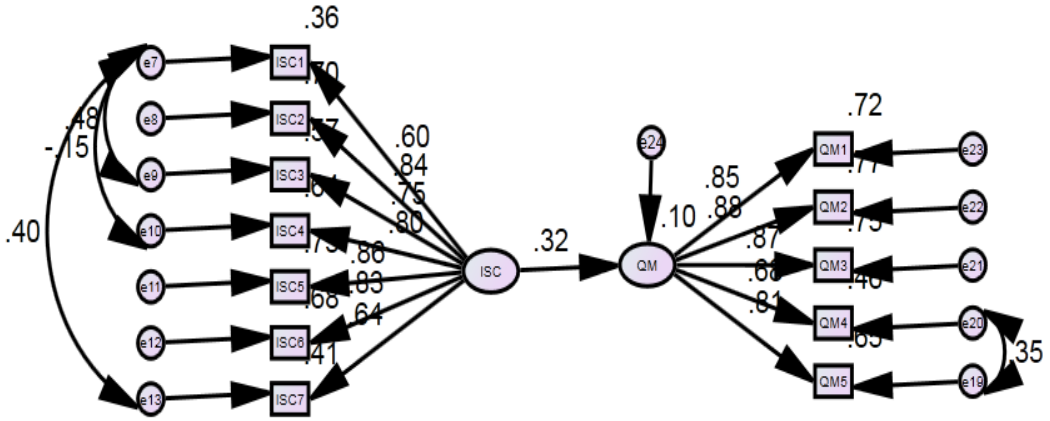
Hypothesized Effect of Information Sharing on Food Quality Management

Hypothesis H_{O1} – Information sharing has no effect on the food quality management

Hypothesis H_{O2} Information sharing is positively related to food quality management

The study established that the path coefficient is positive and statistically significant at 0.05 level of significance (β=0.316, p=0.000, CR=3.325). Information sharing is therefore confirmed to have a positive significant relationship with food quality management and the null hypothesis is rejected.

Figure 2: Hypothesis model of information sharing and food quality management



DISCUSSION OF FINDINGS

The structural equation modeling results showed that the dimensions of information sharing are related to food quality management. This finding is similar to the result obtained by Bahlmann and Spiller (2008). They found that proper coordination of meat supply information enhances quality assurance systems. Study by Tekenaka (2012) also realized that uncertainty of supply in the food enterprises could be minimized with proper coordination of information among the rice producers and processors. However, views raised by Akhtar (2013) review that efficient coordination of the food supply chain for quality depends on the skills and competencies of the coordinating team.

Autora (2012) however noted that though information sharing is crucial to meat quality management, the cost of transaction between large-scale slaughtering and processing enterprises and small-scale producers is high. Stable relationships between processors and producers would reduce the transaction cost and improve the collaboration advantages, in which quality and safety collaboration advantages would be increased, meaning that processing industries are able to provide consumers products with better quality and higher safety.

The study established that most beef small and medium enterprises prefer accurate and reliable information about markets, customers' and production practices but are not very keen on traceability information. The means that there is need for a closer vertical linkage in the beef supply chain in order for the chain partners to receive prompt, timely and relevant information. A major contribution of this study is the development and application of a conceptual framework that provides a study of information sharing and food quality management for the beef enterprises from a developing country's context. It determines how information sharing affects quality management in the food sector. This has not been investigated for the beef supply chain. The conceptual framework can be confirmed as a solid model that provides a foundation for this research.

CONCLUSION AND RECOMMENDATIONS

The study and application of information sharing support the views that, firms in a supply chain can function efficiently in a competitive global market if accurate information is communicated down and upstream the supply chain. Information about customer preferences, food safety, production practices and prices would benefit the supply chain partners in making decisions about changing process or even product designs. Moreover, collective quality management practices of the beef supply chain is paramount if the actors have to maintain a competitive edge over other meat supply chains such as poultry, pork and fish. Improved performance

through production of quality and safe beef products can only be achieved if information flows through inter-linked firms.

In view of the contribution of information sharing and food quality management, managers of beef enterprises should ensure that there is flow of information within and without the organization. This can be done by holding inter-organization meetings, cluster meetings as well as establishing beef supply chain magazines where stakeholders would receive quality related issues. Employees need to be well trained on how to deliver accurate information regarding quality to the relevant authorities for prompt action. Information technology should be embraced within the beef supply chain for fast flow of information.

LIMITATIONS OF THE STUDY

Like all other studies this study has some limitations. The target sample comprises the beef processors and producers in Kenya. Accessing all the target respondents to issue with the questionnaire was unfeasible for this study. Besides, the literacy level among the beef producers was found to be low, which may lead to response error. Purposive sampling for the beef processors and the producers was adopted. The study findings may not therefore be generalized for the other stages of the beef supply chain.

The study population was sourced from Kajiado County which is the main source of beef animals in Kenya. Other minor beef producing counties were omitted in this study. Moreover the study has focused on Beef supply chain. The findings may not be generalized for other meat supply chains such as pork, poultry or fish supply chains. The recommended future research therefore includes; a relatively large sample size to allow for random sampling which would provide a more confident result. To make up for any response error caused by low literacy levels, a mixed method of data collection could be adopted. More research in other livestock related supply chains could be considered and other stages in the supply chain taken on board.

REFERENCES

Abdirahman, Z., & Sauvée, L. (2012). The Implementation of a Quality Management Standard in a Food SME: A Network Learning Perspective. *International Journal on Food System Dynamics3* (3), 214-227.

Ab Wahid, R. (2010). *Beyond certification: the maintenance of ISO 9000 in Malaysian service organizations*. Unpublished PhD. Thesis, University of Waikato, New Zealand.

Akhtar, P.(2013*). Determinants of coordination effectiveness of selected international Agri-food supply chains: A structural equation modelling approach.* Unpublished PhD. Thesis, Massey University. New Zealand.

Autora, C.J. (2012).*Governance Structure Choices in Supply Chain Management. Evidence from Spanish and Chinese Pork Chain Cases*. Madrid: Enero.

Axelrad, S. (2006). *Why FDA Has Adopted HACCP Regulations to Ensure the Safety of Food.* California: Harvard Law School

Bordens,S.K. & Abbott, B.(2008).*Research Design and Methods*. Process approach. New-York: McGraw-Hill.

Bahlmann, J. & Spiller, A. (2008). *The Relationship between Supply Chain Coordination and Quality Assurance Systems: A Case Study Approach on the German Meat Sector*. Paper presented at the 110th EAAE Seminar, Austria.

Bryman, A. (2012). *Social research methods.* New-York: Oxford university press.

Canever, M.D., Hans C.M., Trijp,V.,& Beers,G. (2008). The emergent demand chain management key features and illustration from the beef business Supply Chain Management*: An International Journal. 13*(2), *104–115.*

Cooper, R. & Schindler, P. (2008). *Business Research.* Asia: McGraw-Hills.

Daley, M. (2009). *Exploring the Relationship between Supply Network Configuration, Inter-organizational Information Sharing and Performance. Georgia*: Georgia State University.

Ellebrecht,S.V. (2012). *Application concept for combined preventive quality management methods on inter-enterprise health management in pork chains*. Rheinischen Friedrich-Wilhelms-Universitat Bonn.

Han, J.Q., Trienekens, J.H. & Omta, S.W. (2011). Relationship and quality management in the Chinese pork supply chain. *International Journal of Production Economics,* 134 (2): 312-321.

Hurburgh, C. R., Loy, D., & Lawrence, J. D., (2010). Maintaining Food Safety through Quality. *Agriculture and Environment Extension Publications*. Iowa State University

Israel, G.D. (2015). *Determining Sample Size*. University of Florida.

Kushwaha,.S.G., & Barman,D.(2010). Development of a theoretical framework of supply chain quality management. *Serbian Journal of Management*, 5 (1), 127 – 142.

Lie, A. (2010).*Coordination Processes and Outcomes in Norway and New Zealand: The Challenge of Inter-Organizational Coordination of Food Safety Issues*. New Zealand.

Luig, B. (2011). *Can Food-Safety Be Pro-Poor? Risks, Incentives and Benefits along the Kenyan Beef Value Chain*.Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

Mbwika, J. & Farmer, E. (2012). *End market analysis of Kenyan livestock and meat*; A desk study. USAID: ACDI/VOCA.

Mugenda,G.A.(2010). *Social Science Research. Theory and Principles.* Nairobi: Applied research and training services.

Ngochembo, Gaston, G. (2011). *Investigating the economic potential of pastoralism. The case of Maasai pastoral beef chain in Kajiado District Kenya*. Unpublished MSc.Thesis,Wageningen University, Netherlands

Njenga, E. (2010). *Financial Services in Agriculture Value Chain Report: A study of five Kenyan Sub-sectors namely potato, dairy, coffee, extensive livestock and domestic horticulture*. Oiko Credit.

Otieno, D. J., Hubbard, L. & Ruto, E. (2012). *Determinants of technical efficiency in beef cattle production in Kenya.*Brazil: International Association of Agricultural Economists (IAAE).

Otieno,D.J. (2013). Market and Non-market Factors Influencing Farmers' Adoption of Improved Beef Cattle in Arid and Semi-Arid Areas of Kenya. *Journal of Agricultural Science*, 5, (1).

Pelrine, J.R. (2009). *Agricultural value chain financing in Kenya: Assessment of potential opportunities for growth*. Kenya: Value chain finance Centre.

RoK, (2010). *Economic Review of Agriculture.* Central Planning and Project Monitoring Unit (CPPMU) Ministry of Agriculture.

Spies,D.C.(2011).*Analysis and quantification of the South African red meat Value Chain*. Ph D thesis. University of the Free State. Bloemfontein: South Africa

Talib, H. H. A., Ali, K. A. & Idris, F. (2013). Quality management framework for the SME's food processing industry in Malaysia. *International Food Research Journal,* 20(1), 147-164.

Tekenaka, S. (2005). *Quality enhancement in food processing through HACCP (Hazard Analysis and Critical Control Point).*Tokyo: Asian Productivity Organization.

Thongrattana, P.T. (2012). *An analysis of the uncertainty factors affecting the sustainable supply of rice production in Thailand*. Unpublished, PhD, Thesis. University of Wollongong. Sydney.

Webber, M. C. & Labaste, P. (2010).*Building Competitiveness in Africa's Agriculture a Guide to Value Chain Concepts and Applications*. Washington DC: The International Bank for Reconstruction and Development. World Bank.

Wever, M., Wognum, N.,Trienekens, J.& Omta, O.(2010). *Alignment between chain quality management and chain governance in EU pork supply chains: A Transaction-Cost-Economics perspective*. Netherlands: Wageningen University.