Traceability among Smallholders in the Organic Fresh Produce Value Chain: Case of Nairobi

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Key words: traceability, information flow, organic, value chain

Abstract

Traceability enhances information sharing and disclosure thereby increasing trust among stakeholders along value chains. This research assessed information flow along organic fresh produce value chain using a participatory study of certified organic farmers and outlets around Nairobi in February, 2012. Traceability was limited since majority of stakeholders were smallholders who had no functional traceability system. There were two main drivers of traceability; organizational activities and personnel perception. Variables in the organizational activities were interrelated and included documentation, certification by other quality management standards, training on food safety and traceability and quality systems monitoring. In addition, group activities increased trust among value chain actors. Extension services emphasizing on documentation, quality management systems certification, employee training, group activities and system monitoring should be conducted to improve traceability.

Introduction

Organic production is a dynamic and rapidly-growing sector of the global food industry (Ponti et al., 2012). Information flow is vital for food safety and quality management along value chains. Inadequate credible product information flow can compromise safety and quality of food (Souza-Monteiro and Caswell, 2010). Linking traceability with information flow and documentation improves operational efficiencies, safety and quality (Ruiz-Garcia et al. 2010). This is important for credence attributes; those which consumers cannot detect either prior or after consumption of food (Hall, 2010). Food traceability systems record information during production and distribution using paper or electronic systems. This study describes information flow among actors in the organic fresh produce value chain. Specifically, the study assessed presence of product traceability and factors that contribute to traceability among smallholders in developing countries with Nairobi City as the case study.

Material and methods

Study design

Survey was designed to get specific information on the given population. A two step study approach was used; mapping the organic fresh produce value chain then evaluating traceability along this chain. The study was conducted around Nairobi since most of the local organic markets are found around the city where majority of the consumers are foreigners and affluent higher middleclass persons (Kledal et al. 2008).

Sampling procedure

Stakeholders in the organic fresh produce value chain around Nairobi were identified using snowball sampling technique. Since the total population was small, complete census of identified actors was done.

Data collection

A total of 38 organic kales farmers, 10 traders and 2 organic farmers' market officials were interviewed between February, 2012 and June, 2012. Data was collected through interviews using three sets of semi-structured questionnaires specifically designed for the target respondent (farmers, farmer groups' officials and traders). The questionnaire provided a guide to the interviewer, covering details of the traceability systems used, employee perception on chain traceability, documentation, training, monitoring and review of

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traceability systems, and the challenges faced during tracing and tracking organic fresh produce. Five-Point Likert scale was adopted as the basic scale for ranking questions.

Data analysis

Descriptive data from interviews was used to present the data, content analysis used to analyze qualitative data while exploratory factor analysis used to uncover the underlying variables which influence traceability. The Kaiser-Meyer-Olkin (KMO-test) and Bartlett's test were used to check adequacy of the factor analysis. Extraction of factors was done using the Eigen values of the correlation matrix (Rietveld and Van Hout, 1993). Since some factors could be interrelated, oblique rotation was used. SPSS version 17 was used to run the analysis.

Results

Most organizations certified as 'organic' had adopted product and information traceability systems as demanded by the certifying organic standards. Organic fresh produce traceability was limited mainly because of the small- scale nature of most farmers. There were also differences in the information traced in terms of the precision, depth, breadth, and accessibility to information by other members in the supply chain. These negatively affected chain traceability along the supply chain. There were several reasons for tracking and tracing organic fresh produce with most respondents using the traceability system as a means to gain competitive advantage, for organizational sustainability and to convey information on the product characteristics along the chain.

More than 75 percent of the actors had a positive perception on traceability. Certification by quality management systems was not mandatory although as indicated by Maldonado-siman et al. (2012), organizations operating under these standards had better traceability and quality verification systems. From the study, 35.7 percent of respondents perceived that certification by other quality management systems had a great impact in their traceability systems; however, only 23 percent had been certified with these quality management systems.

Traceability was influenced by two drivers, that is, organizational activities and the perception of traceability by the personnel. These accounted for 60 percent of the variance with the first driver accounting for 38.3 percent while the second one accounted for 22.9 percent. Variables in the first driver were monitoring, documentation, certification and training. These represented the organizational drivers that positively contribute to traceability. The second driver represented variables that affect employees' perception to the traceability system. Variables in these two drivers were interrelated. These results were similar to previous research; personnel perception (Pouliot and Sumner, 2008; Heyder, 2012), organizational drivers such as certification by other quality management systems and documentation (Gawron and Theuvsen, 2009) and labelling (Raynaud et al. 2009).

The organic sector was dominated by small scale actors with minimal assess to finances for implementing a functional traceability system. There was also lack of an appropriate and rapid traceability system capable of tracing organic fresh produce that can account for losses as a result of spoilage, withering and dehydration. Seasonality of fresh produce also affected the tracing system. Employees had inadequate knowledge on record keeping and documentation which affected their perception in traceability.

Discussion

There were two main drivers of traceability; organizational activities and personnel's perception. Variables in the first driver were presence of a quality management systems, documentation and record keeping, certification with a quality system and personnel training. Variables in the second driver affected employees' perception on traceability. Variables in both drivers were interrelated.

Traceability along organic fresh produce chain was limited. Use of labels and documentation was limited. Only part of the information was traceable; basic primary production and processing characteristics and identity of immediate actors both upstream and downstream the supply chain being traceable. Majority of the actors did not have functional chain traceability strategies to access and share information with others along the chain. At primary production, group affiliation and regular checks on the verification and monitoring systems by group members increased trust along the value chain.

Suggestions

The study recommends capacity building of smallholder actors through training on documentation of the basic production and process characteristics and use of identification tags and labels. Design of a system which enhances information flow and information retention with rapid access by other actors is necessary. Group activities such as chain traceability, group certification, training, monitoring and documentation should be encouraged to reduce cost in setting up a traceability system.

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