

# **THE STATUS OF FOOD SAFETY MANAGEMENT SYSTEMS IN GHANA**

## **AUTHORS**

N.B. Ackah, A.H. Andoh-Odoom and P.T Akonnor

Council for Scientific and Industrial Research (CSIR) - Food Research Institute, P.O. Box M20, Accra, Ghana

**October, 2017**

## **ABSTRACT**

In Ghana, there is not enough scientific information about the implementation of food safety management systems (FSMS). This study therefore aimed at getting insight into the current status of FSMS in Ghanaian food processing companies. This was a descriptive case study conducted in Tema. A questionnaire was administered to 70 companies which were randomly selected for the survey with a response rate of 65.7%. SPSS 17.1 was used to analyze the results obtained and STATA 12 used to determine the linkages between having a food safety management system in place and variables including market focus. The results indicated that more than 54% of the companies did not adhere to any quality assurance guideline. (56.5%) of the companies were not certified to any standards and 85% of the respondents cited cost as the main challenge in implementing a food safety management system. More than 40% of the companies had not been inspected by food regulation authorities since they were established. It has been recommended that Management of food processing companies must play an active role in adopting and implementing some form of food safety management system to guarantee a consistent production of safe products for consumers.

*Keywords: Food Safety Management Systems, Quality Assurance, Food Safety*

## **INTRODUCTION**

Food is a basic need of all living things and consumers all over the world are entitled to safe and nutritious food. However, there have been many reported cases of food-related illnesses worldwide. It is estimated that each year, 600 million people, which is about 10% of the world's population, fall ill due to unsafe foods with 420,000 of them dying (WHO, 2015). When food poisoning occurs, huge sums of money are used for medication and lives can be lost, causing much grief and pain to loved ones. The burden of food borne diseases can therefore not be over-rated. The Sanitary and Phytosanitary (SPS) Agreement confirms the right of World Trade Organisation (WTO) members to introduce their own standards for which they have scientific evidence, to limit food safety risks (WTO, 1995). As a result of this provision, different countries

and other stakeholders have established different Quality Assurance (QA) standards and guidelines to which foods must conform. The mandatory use of hazard analysis and critical control points (HACCP) by food processors in several countries is now becoming a norm. Food processing companies, in order to facilitate food safety assurance, integrate these regulations and standards into their quality management systems (QMSs). Food safety assurance is the guarantee that foods will not cause harm to any consumer. It is strongly shaped by evolving trends in consumer preferences, climate change and globalization of the food trading system (Cheftel, 2011). Uyttendaele *et al.*, (2016) suggest that the most effective way to address food safety is through a holistic risk management approach, which considers the whole food chain. This is integrated into food safety management systems (FSMSs), which are developed, implemented and maintained by food processing companies to improve the safety output of their food products. FSMSs are used by processing companies to establish and manage processes required for the assurance of food safety (Luning and Marcelis, 2009). Quality management, as part of FSMSs is an essential tool which ensures that the quality of food products is continually improved. It also increases a company's capacity to prevent foodborne contamination (Ollinger *et al.*, 2011). The utilization of FSMSs to reduce food safety risks has a costly impact on companies. This has been cited by some Ghanaian food processors for not using FSMSs (Mensah and Julien, 2011). It is no secret that some food products from developing or least developed countries do not meet international quality requirements. This has led to, for example, the rejection of some foods coming from Ghana into the European Union (RASSF). Although several legislative instruments (such as Public Health Act, 2012 (Act 851), Ghana Tourism Act, 2011 (Act 817) and Ghana Standards Board (Amendment) Decree, 1979 (A.F.R.C.D. 44)), have been enacted, compliance is still below expectation. Mensah and Julien (2011) found that the laws in Ghana were not properly enforced and regulatory visits were not frequent (sometimes less than once in two years). Most food safety studies in Ghana have focused on the informal catering sector (street foods) with very little information about the formal sector (food processing) (Ababio and Lovatt, 2015). There is also very little information about the status of FSMSs in food processing companies in Ghana. This may translate into consumers and regulators under-demanding food safety due to unavailable data especially relating to food-borne diseases. Information concerning the status of FSMSs will be crucial for the national development. It will contribute to making effective Policies on Food Safety and the management systems designed to assure food safety. This work therefore sought to identify the status of Food Safety Management Systems at some processing companies in Greater Accra Region, Ghana.

## **METHODOLOGY**

### ***Study area***

This study was carried out in Tema Heavy Industrial Areas, where a lot of the food processing companies in Ghana are situated. Tema (5° 40' 0.0012" N) lies to the East of Accra, in the Greater Accra Region. The study area, which is considered the industrial hub of Ghana, is well planned for industrial activities.

### ***Research design and data collection***

The study was a descriptive case study (deVaus, 2001) which focused on food processors as the case and Food Safety Management Systems as the phenomenon. A list of food processing companies in Tema area was obtained from the Food Research Institute (FRI), Ghana. The FRI conducts quality control tests for various food companies in ISO 17025 accredited laboratories. A random sample of 70 companies from this list was selected for the survey. A questionnaire containing both open-ended and closed questions was administered either via an online survey tool ([https://esurv.org/online-survey.php?surveyID=LOLIGI\\_d4ad510](https://esurv.org/online-survey.php?surveyID=LOLIGI_d4ad510)) or face-to-face to the selected companies. The questionnaire was sectioned into 3 parts. The first part contained questions pertaining to company characteristics. The second part was made up of questions concerning quality assurance programs, while the third part asked questions pertaining to food safety management challenges. The questionnaires were administered to the person in charge of quality matters at the company. This was either the owner, quality control officer, quality manager or the production manager of the selected companies. A response rate of 65.7% was obtained in this survey. Companies which did not respond either refused to take part in the study or the people with the requisite knowledge to answer the questions were unavailable.

### ***Data processing and analysis***

Responses of open-ended questions from the survey were directly coded and analyzed using SPSS 17.1. Using a qualitative approach of content analysis, responses to open ended questions were aggregated into units of ideas before coding and analysis in SPSS. Descriptive analysis was mainly used to describe and visualize the data obtained in this study.

Binary logistic regression (STATA 12, StataCorp LP, USA) was used to determine the association between having food safety management systems in place and variables such as company's market focus, industry classification, presence of a Quality Assurance (QA) department and a trained quality assurance officer (Table 1).

Table 1 Description of variables in the model

<b>Variable</b>	<b>Description</b>
<b>X<sub>1</sub></b>	Market focus
<b>X<sub>2</sub></b>	Industry classification
<b>X<sub>3</sub></b>	Quality Assurance department
<b>X<sub>4</sub></b>	Trained Quality Assurance officer

## **RESULTS**

More than 60% of companies which responded to the survey were privately owned whiles 15.2% were subsidiaries of multinational companies, and the rest were Public Private Partnerships or family businesses (Fig 1).

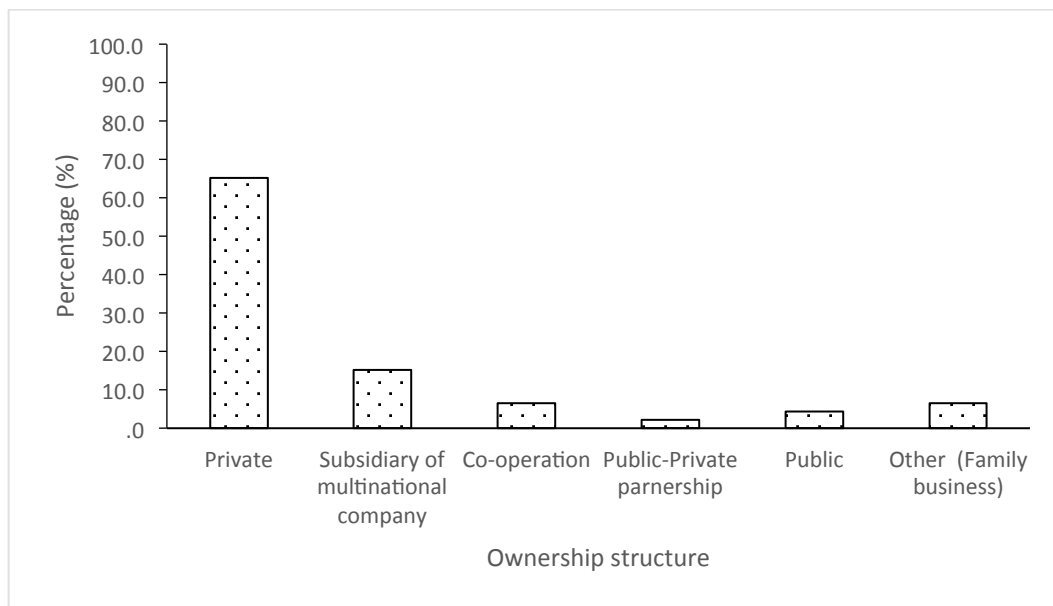


Figure 1: Ownership structure of companies

A majority of the companies (71.7%) fell within the small scale category which employ less than 10 people (Abor and Biekpe, 2006) while 10.9% were medium scale and 17.4% were large scale companies. Nearly 57% of these companies have been in existence for less than 10 years while the remaining 43% have been operating for more than 10 years. About 41% targeted local markets (71% of these targeted open market while 29% targeted supermarkets) while 6.6% targeted only export markets. The rest targeted both local and export markets. Fifty percent of the companies had quality assurance units/departments while 54.3% employed trained Quality Assurance personnel. More than 60% of the companies visited had a quality policy in place (Table 2).

Table 2: Quality Management Requirements (n=46)

Requirement	Response (%)	
	Yes	No
Quality Policy	63.0	37.0
Quality Control and Assurance Department	50.0	50.0
Quality Assurance Manager	54.3	45.7

More than 54% of the companies did not adhere to any quality assurance guideline while 6.5% of the companies had HACCP-based FSMSs, 37% had FSMSs based on good manufacturing practices (GMP) / prerequisite programs (PRP) and 2.2% adhered to the International Standardization Organization standard ISO22000. Nearly 24% indicated that they had the FSMS in place because of compulsory government regulation while 21.7% attributed their implementation of FSMS to customer/stakeholder requirements.

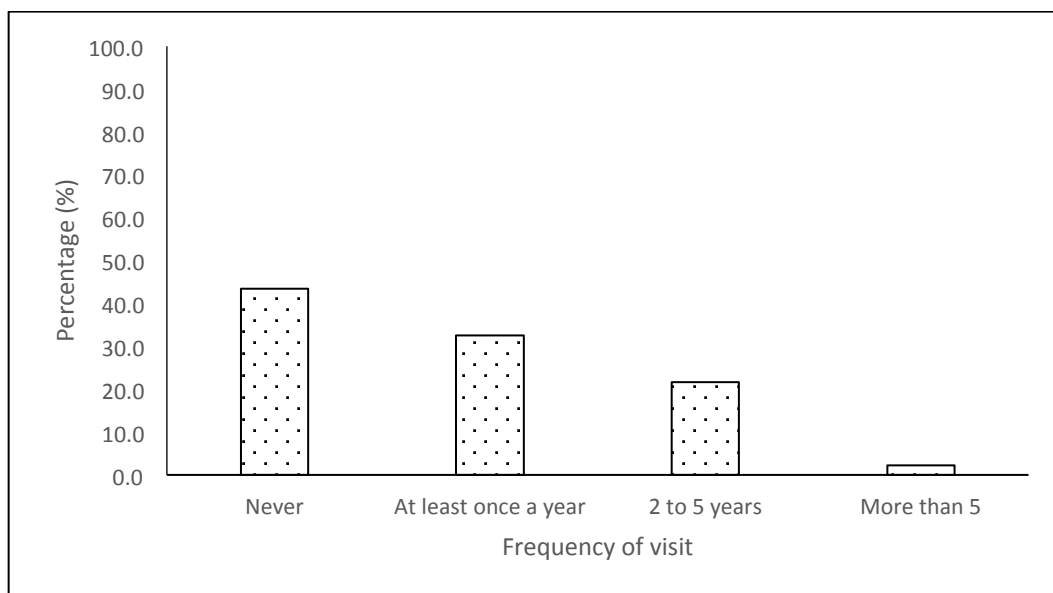


Figure 2: Frequency of facility inspection

The results of the present study reveal that nearly 45% of the companies had not been inspected or audited by food regulation authorities since they were established while about 36% of them reported that over the past year, their facilities had been inspected on at least one occasion (Figure 2).

The companies which do not have a Quality control and assurance (QC & A) department (Table 2) repose this responsibility in a single individual. In these companies either the CEO or the Production manager is in charge of quality issues. A majority (56.5%) of the companies visited were not certified to any quality standard. Only 6.5% of the companies had been certified to other international standards such as British Retail Consortium (BRC), British Standards Institution (BSI) or ISO 22000. 36.9% had been officially certified to national standards based on GMPs, PRPs or HACCP by the national regulatory bodies (FDA and/or GSA) (Table 3).

Table 3: Types of certification

Certification	Number of Respondents	Percentage (%)
<u>Official (n=20)</u>		
International (BRC, BSI, ISO 22000)	3	6.5
National (GSA, FDA)	7	15.2
Food Safety (GMP, HACCP)	10	21.7
<u>None at all (n=26)</u>		
No certification	26	56.5

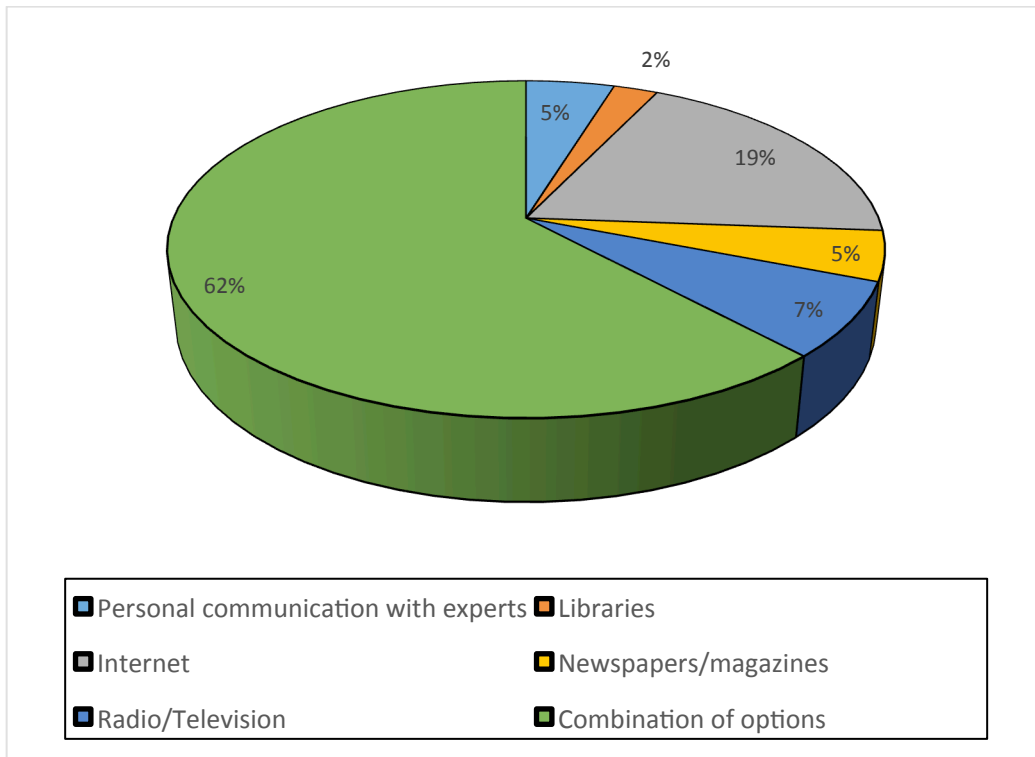


Figure 3: Sources of food safety information

The results showed that respondents' source of scientific and technical information varied widely. They mentioned the internet and personal communication with experts, radio and television and magazines as major avenues of obtaining information (Figure 3), among other sources. A majority (62%) of our respondents suggested a combination of sources, the most dominant single source, however, was the internet. Respondents were asked about the occurrence of food safety quality issues after production, during storage or delivery. A significant number of respondents (56.5%) indicated that they had not encountered any food safety hurdle. The remaining 43.5% have had to contend with various food safety/quality issues including spoilage.

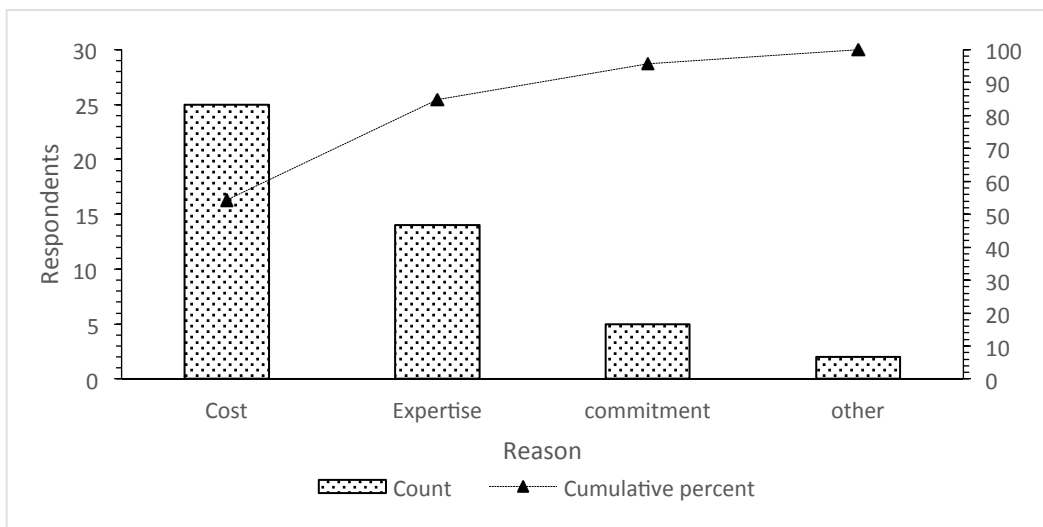


Figure 4: Reasons for not implementing FSMS

Indeed, to a majority of our respondents (85%), cost mainly accounts for their challenge in implementing a standard food safety management system (Figure 4). The respondents in this survey also identified the lack of technical knowledge and expertise to manage the system after its implementation as another challenge that confronts them (Figure 4).

Table 4 presents a model showing the influential determinants of having a FSMS in place. As presented, company's market focus and the presence of a QA department were found to be positive determinants of whether or not a company has implemented an FSMS, with QA department being the most influential factor.

Table 4: Logit regression model

Variables	Coefficient	Std Err	Z	P> Z
Market focus ( $X_1$ )	3.182	1.443	2.20	0.027
Industry classification ( $X_2$ )	2.546	2.546	1.39	0.164
QA department ( $X_3$ )	4.562	1.498	3.04	0.002
Trained QA officer ( $X_4$ )	0.098	1.586	0.06	0.950
Constant ( $\beta_0$ )	-6.971	2.996	-2.33	0.020
Model statistics				
No. of observations=45				
Log likelihood=-9.467				
LR $\chi^2$ (4)= 43.25				
Prob > $\chi^2$ =0.000				

## DISCUSSION

The results obtained from this survey showed that more than half of the companies questioned did not adhere to any quality assurance guideline. This confirms an earlier finding by Mensah and Julien (2011) who observed that food companies that produced for the Ghanaian domestic market did not comply with international requirements for food quality. However, more than 60% of the companies visited had a quality policy in place. This observation suggests that majority of these companies seem committed to the implementation of a FSMS since it is one way of showing commitment to such systems (Luning and Marcelis, 2009).

The companies which were studied had different reasons for implementing a particular FSMS. These reasons included compulsory government regulation and customer/stakeholder requirements. It has been reported that the implementation of quality assurance programs in a company is based on different incentives such as market drive, mandatory governmental regulations and liability norms (Jayasinghe-Mudalige and Henson, 2007). For example, a study in Mauritius concluded that the main reason for implementing food quality management systems by companies under study was to comply with their importing countries' legislative requirements (Ramnauth *et al.*, 2008).

Almost half of the companies in this survey indicated that though they were in production, they had never been visited or inspected by the authorized regulatory body. The motivating factors that have been identified for a food company to select and implement QA standards/guidelines are the likelihood of future regulation, the value of the QA standard for marketing, and avoiding food safety problems (Wilcock *et al.*, 2011). It has also been suggested that stakeholder pressures also play a key role in a company's decision to implement a particular type of FSMS (Karipidis *et al.*, 2009). Some of these stakeholders may be the government, retailers, parent company of multinational companies and customers. It is strongly believed that food safety and quality management should be a shared responsibility across all levels of an organization (Guldenmund, 2000). However, the companies which do not have a Quality control and assurance department repose this responsibility in a single individual. In these companies either the CEO or the Production manager is in charge of quality issues. This observation may be explained by the combined effect of capital and limitation in human resource capacity.

Although companies stand to benefit immensely, the creation of a standard QA department may increase the cost of operations. Indeed, to a majority of our respondents, cost mainly accounted for their challenge in implementing a standard Food Safety Management System. This observation was not surprising because it has been reported that most food companies face a lot of challenges in the implementation of FSMSs and complying with food quality standards more importantly due to the high cost involved and its subsequent effect on company profits (Trienekens and Zuurbier, 2008; Herath and Henson, 2010; Mensah and Julien, 2011).

The respondents in this survey also identified the lack of technical knowledge and expertise to manage the system after its implementation as another challenge that confronts them. The results were not surprising since most of the companies visited were within the Small and Medium Scale Enterprise SME category, which according to Blanton and Dorman (1994), frequently lack capital. These observations may be attributed to the fact that most of these companies lack the technical and scientific capacity to implement and remain in compliance with the stringent modalities that come with most of these standards.

Food safety literature presents important information to enhance the knowledge and skill of processors about food production and safety management. The results showed that respondents' source of scientific and technical information vary widely. They mentioned the internet and personal communication with experts, radio and television and magazines as major avenues of obtaining information among other sources. The most dominant single source, however, was the internet. This source was also noted, in previous studies, as an important source of food safety information to consumers (Nan *et al.*, 2016). The resources listed could provide a wealth of information which will help food manufacturers to understand and appreciate the importance of Food Safety Management Systems.

The logit analysis showed that whether or not a company had a Food Safety Management System in place was largely dependent on having a QA department. This observation is plausible because the quality assurance department takes the lead and is pivotal in the implementation of Food Safety Management Systems. The Company's trade focus was also an influential variable in the implementation of Food Safety Management Systems. Companies whose products trade locally are not bound by strict international requirements for food safety and quality. On the other hand, companies who trade on international markets are required (depending on the



jurisdiction) to implement stricter quality assurance systems such of international repute. This finding conforms to findings from a study in Mauritius which asserted that compliance to importing country's legislative requirements was the main reason for implementing food quality management systems by the companies under study (Ramnauth *et al.*, 2008).

## CONCLUSION

Regulation of food processing activities is the responsibility of governmental agencies. The results of the present study has revealed that more than 40% of the companies had not been inspected or audited by food regulation authorities since they were established. About 43% of companies had a formal FSMS implemented in their facilities. Cost and expertise were found as the main challenges to implementation of FSMS among the companies visited. Management of food processing companies must play an active role in adopting and implementing some form of FSMS to guarantee a consistent production of safe products for consumers. Consumers in developing countries are increasingly becoming aware of the potential danger of patronizing food products from uncertified sources. As a result the implementation of a good FSMS within a company safeguards its products and presents an opportunity for enhanced trading both locally and internationally.

## REFERENCES

- Ababio, P. F., and Lovatt, P., 2015. A review on food safety and food hygiene studies in Ghana. *Food Control*, 47: 92-97.
- Abor, J and Biekpe, N., 2006. Small Business Financing Initiatives in Ghana. *Problems and Perspectives in Management*, 4: 69-77.
- Blanton, W.R. and Dorman, T.L., 1994. Small Business Spotlight. SBA Loans for Community Banks. *Journal of Commercial Lending*, 76. 02/01/1994.
- Cheftel, J.C., 2011. Emerging Risks Related to Food Technology, In *Advances in Food Protection*, (Ed. M. Hefnawy), NATO Science for Peace and Security Series A: Chemistry and Biology.
- de Vaus D.A., 2001. *Research Design in Social Science Research*. Sage Publications. Ch. 13.
- Ghana Public Health Act, Act 851, 2012. Ghana Public Health Act 851. Government Printer, Assembly Press, ACCRA. GPC/A753/ 350/11/2012.
- Ghana Tourism Act, Act 817., 2011. Available at <http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwegha.htm>. Last assessed at 3<sup>rd</sup> August, 2016.
- Guldenmund, F.W., 2000. The nature of safety culture: a review of theory and research. *Safety Science*, 34: 215-257.
- Herath D. and Henson S., 2010. Barriers to HACCP Implementation: Evidence From the Food Processing Sector in Ontario, Canada, *Agribusiness*, 26 (2): 265–279.
- Karipidis P., Athanassiadis K, Aggelopoulos S. and Giompliakis E., 2009. Factors affecting the adoption of quality assurance systems in small food enterprises, *Food Control*, 20: 93–98.

- Luning P.A. and Marcelis W. J., 2009. Food Quality Management; Technological and Managerial Principles and Practices, Wageningen Academic Publishers. Ch 7.
- Mensah L.D. and Julien D., 2011. Enhancing Access to the Global Food Manufacturing Value Chain: The Role of a Food Safety Technical Regulation in Ghana, *Journal of International Food & Agribusiness Marketing*, 23 (3): 247-270.
- Nan, X., Verrill, L., and Kim, J., 2016. Mapping Sources of Food Safety Information for US Consumers: Findings From a National Survey. *Health communication*, 1-10.
- Ollinger, M., Muth, M.K., Karns, A.S. and Choice, Z., 2011. Food safety audits, plant characteristics and food safety technology use in meat and poultry plants. *Economic Information Bulletin No. 82*. USDA
- Rapid Alert System for Food and Feed (RASFF), available at <https://webgate.ec.europa.eu/rasffwindow/portal/?event=SearchByKeyword&NewSearch=1&Keywords=ghana>, Last visited on 3<sup>rd</sup> August, 2016.
- Standards Authority Act., 1973. Available at <http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwegha.htm>. Last assessed on 3<sup>rd</sup> August, 2016.
- Trienekens J. and Zuurbier P., 2008. Quality and safety standards in the food industry, developments and challenges, *International Journal of Production Economics*, 113 (1): 107–122.
- Uyttendaele, M., De Boeck, E., and Jacxsens, L., 2016. Challenges in Food Safety as Part of Food Security: Lessons Learnt on Food Safety in a Globalized World. *Procedia Food Science*, (6), 16-22.
- World Health Organization (WHO)., 2015. Food safety, Fact sheet N°399, Available at <http://www.who.int/mediacentre/factsheets/fs399/en/>, Last visited on November 1<sup>st</sup>, 2016.
- Wilcock A., Ball B. and Fajumo A., 2011. Effective implementation of food safety initiatives: Managers', food safety coordinators' and production workers' perspectives, *Food Control*, 22 (1): 27–33.
- World Trade Organization (WTO)., 1995. Sanitary and Phytosanitary Agreement, Available at [https://www.wto.org/english/tratop\\_e/sps\\_e/spsagr\\_e.htm](https://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm), Last visited on 8<sup>th</sup> January, 2017.