Food Safety Management Practices and Compliance of Selected Cacao Enterprises in Davao City

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Abstract

In the Philippines, eighty percent (80%) of national cacao output is produced in Davao Region and is thus known as the "Cacao and Chocolate Capital of the Philippines". Due to the high quality of processed Philippine cacao, it is poised to be one of the country's top export commodities. Food safety standards must, however, be met by cacao processors for export competitiveness. The study assessed the food safety management practices and compliance of selected cacao producers and manufacturers in Davao City, Philippines. A multi-case qualitative research design was employed through interviews, survey and ocular inspection in the selected enterprises. The

findings revealed that compliance to food safety standards was highly driven by the market/buyer side of the chain. Most of the cacao enterprises perceived their operations as heavily compliant to food safety standards. However, the unavailability of equipment and lack of consistency of food safety policies were some of the identified issues among the processors. In addition, farmers' practices relied heavily on extensive experience than on properly documented procedures in the production chain. Recommendations of the study include acquisition of equipment crucial in ensuring food safety (e.g. mechanical dryers), remedial training for employees and managers on food safety, formulation of formal food safety written policies, and formalizing a traceability system for enterprises are recommended.

Background of the Study

Several opportunities are opening for the Philippine cacao and chocolate industry as global demands have been increasing. Philippine cacao beans and locally-produced chocolate products are gaining international recognition due to their excellent quality (Bureau of Plant Industry, 2016; Carillo, 2017). With the growing demand for cacao, the government has distributed (as of 2016) around 38,000,000 seedlings through the Department of Agriculture-High Value Crops Development Program (DA-HVCDP), Department of Environment and Natural Resources–National Greening Program (DENR-NGP), and the Philippine Coconut Authority-Kaanib Program (PCA-Kaanib Program) (Bureau of Plant Industry, 2016). However, production of cacao in the Philippines has only grown by 55.04% from 2008-2018. The Cacao Industry Development Association of Mindanao (CIDAMI) executive director, Valente Turtur, has stated that the annual production target for cacao may be too ambitious. Turtur recommends that focus should instead be placed on improving the quality of the cacao in order to improve its access to the global market for premium chocolate (Colina IV A. L., 2019).

Furthermore, food products are often subjected to several tests and certification requirements before they are allowed to enter certain countries, such as Japan (USDA, 2018). In the Philippines, one has to have a License to Operate (LTO) from the Food and Drug Administration (FDA) to be able to export abroad. Under the Food Safety

of 2013, the FDA requires that before products can be imported, exported, distributed, marketed, advertised or manufactured in and out of the Philippines, a foreign investor or company must first secure a License to Operate (LTO) from the FDA as: 1) Importer, Distributor or Wholesaler if their products are going to be imported from different countries; or as 2) Manufacturer if their products are going to be manufactured locally (Kittelson Carpo Consulting, 2020). Further, under the act, traceability "will be established for foods at relevant stages of production, postharvest handling, processing or distribution, when needed to ensure compliance with food safety requirements" (Official Gazette, 2015). This traceability requirement of the Act will necessitate that all coffee farms should be Good Agricultural Practices (GAP)-certified. Further, manufacturing enterprises should be Good Manufacturing Practices (GMP)- and Hazard Analysis and Critical Control Points (HACCP)-certified.

Thus, with the growing export opportunities for Philippine cacao and chocolate products, it is important that local producers are able to meet international standards for food safety. Assessing the food safety culture of an organization is a good means to raise awareness, benchmark, and promote commitment within the organization on food safety. It can also be a means for identifying weaknesses, evaluating risks, avoiding errors and legal liabilities from food poisoning cases, and making informed decisions on training and remedial actions (Griffith, Livesey, & Clayton, 2010). The study was conducted in Davao as this region produces majority (80%) of the cacao in the Philippines. The study focused largely on assessing the compliance of the three selected cacao enterprises to food safety standards during the production and processing of cacao. This study included chocolate producers that have factories located in, and source their raw materials (i.e. dried fermented cacao beans) from Davao City. The names of the processors are withheld as requested by the owners and hence hereby labelled as Enterprise 1, 2 and 3.

Food Quality and Food Safety

Food safety is concerned with all hazards in food production and assurance that the food consumed will not harm the consumer. Food quality, on the other hand, may vary

from person to person depending on their standards. A food item can be of good quality but unsafe for consumption, however, both are related in terms of having social, economic, and environmental effects. Both food quality and safety contribute to consumer confidence (Aung & Chang, 2014). Furthermore, food safety has become a major concern for most organizations due to credibility crisis and immense public opinion about the food sector. Food enterprises are in turn forced to improve the quality and food safety standards of their products. This gives emphasis on the need for food safety management systems in food supply chains in order to create a framework for an internationally harmonized market (Panghal, Chhikara, Sindhu, & Jaglan, 2018).

Food Safety Management System (FSMS)

Food safety management systems (FSMS) are prerequisites to ensuring long term quality assurance/management and later a long term managerial strategy within an organization. A FSMS is the consistent and persistent development of food safety requirements. It is a means of controlling hazards and risks in a food business (Aung & Chang, 2014; Erceg, 2015).

Several food safety management systems/quality metasystems have been developed to reflect and support several private food safety and quality standards such as Hazard Analysis and Critical Control Point Analysis (HACCP), Good Manufacturing Practices (GMP), and Good Agricultural Practices (GAP). These systems may be found within private standards (i.e. SQF 2000) and/or voluntary public standards at the national/international level (i.e. ISO 9000).

Food Safety Along the Value Chain

New food safety risks come with the increasing globalization and elongation of agri-food supply chains as food products go through more stages of processing and actors managing these processes. In response, public and private standards have tightened and evolved over the years. Gereffi & Lee (2009) created a framework (Figure 1) that relates food safety to the level of concentration of either side of the value chain.

According to their framework, value chains that are concentrated on either side – supplier and buyer side – follow more comprehensive food safety standards. Value chain actors in highly concentrated supply and demand sides have notable market & brand power, leverage, and resources to control the value chain, thus they are able to impose more comprehensive food safety standards. On the other hand, value chains with fragmented value chains follow less comprehensive food safety standards since value chain actors in the supply and demand sides do not have the power to dictate which food safety standards to abide by.

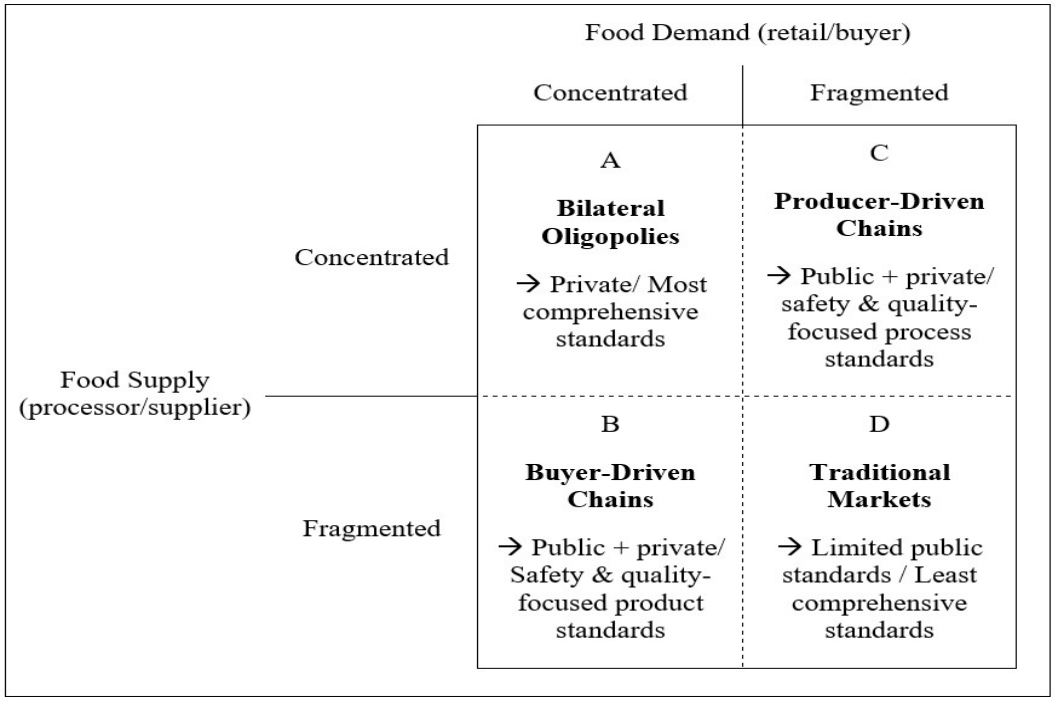

Figure 1. Value Chain Standards and Governance (Source: Gereffi and Lee, 2009)

Cacao and Chocolate Production in Davao Region, Philippines

The basic process of producing chocolate occurs in two stages. The first stage includes growing, harvesting, fermenting, drying, and shipping the cacao beans, while the second stage involves the processing of the cocoa beans into dark chocolate: inspection, cleaning, roasting, shelling, winnowing, grinding, and conching (Ferrigno, Murino, Romano, & Akkerman, 2013).

Davao Region produces 80% of the Philippines' cacao with approximately 29,000 hectares of land planted with cacao trees (as of 2017), thus dubbed as the cacao and chocolate capital of the Philippines. In 2018, the total volume of production of cacao in the Philippines was at 7,983.20 MT with 6,461.77 MT of production coming from the Davao Region (Davao City Cacao Industry Development Council , 2018). Nine of the 11 administrative districts in the Davao Region are involved in the production of cacao in Davao, namely: (1) Calinan, (2) Baguio, (3) Marilog, (4) Toril, (5) Tugbok, (6) Paquibato, (7) Buhangin, (8) Bunawan, and (9) Talomo.

Research Problem and Methodology

Assessing the food safety compliance and food safety management of cacao producers and processors along the cacao value chain is of great importance. This study assessed the food safety management practices and compliance of selected Cacao producers and manufacturers in Davao City as guided by the framework below using a multi-case qualitative research design.

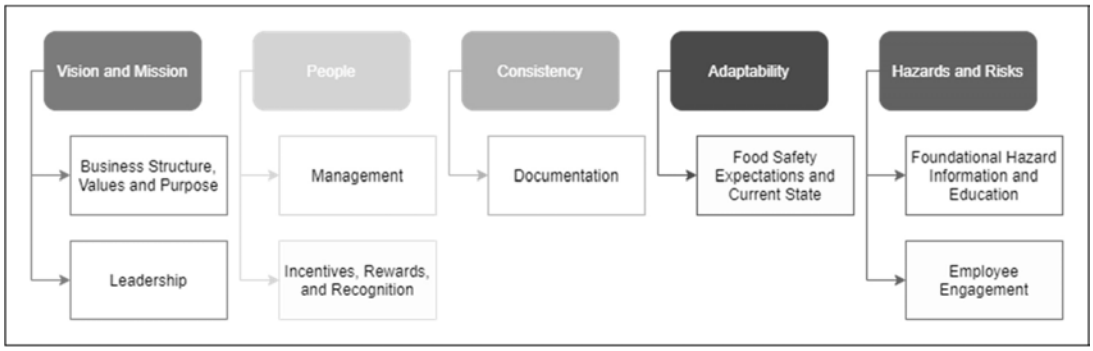

Figure 2. Framework adapted from GFSI Food Safety, & Culture Working Group (2018)

Comprehensive analysis of the food safety management, compliance, and culture of the selected cacao enterprises was conducted by combining interviews, questionnaire facilitation, observations, and document reviews.

Food safety standards (Philippine National Standard for *Tablea* and Codex Alimentarius on Low-Moisture Foods) served as basis for assessing the food safety management and compliance along the chain of selected enterprises. Critical control

points identified for cacao production and chocolate processing (Yunus, 2016; Afoawaka, Mendah-Brown, Crentsil, Frimpong, Asante, 2013) were used as basis in assessing risk and in proposing a traceability system.

Research Findings

Three cacao-chocolate enterprises served as the subjects of this case research investigation: (1) a fully integrated, OFW-owned corporation which follows a contract-farming scheme for Cacao production; (2) a forward-integrated, family-owned business which was the first to venture into dark chocolate manufacturing and practiced *suki*[163] (loyalty) system in supply chain decisions; and (3) agrarian reform beneficiary cooperative that covers over 100 hectares of cacao plantation which recently ventured into cacao chocolate manufacturing..

Food Safety Culture of the Selected Cacao Enterprises

The dimensions of food safety culture were vision and mission, people, consistency, adaptability and hazards and risks. The three enterprises perceived assessed themselves with almost similar ratings (toward the higher side of the scale) in terms of their organization's food safety culture. This is because food safety standards adopted by each organization varied with some being more stringent and others more lenient. Thus, there is a need for enterprises to benchmark their food safety policies and culture with organizations that have exceptional compliance with food safety practices and positive food safety culture.

Table 1. Food Safety Culture Self-Assessment of Enterprises

Dimension	Enterprise		
	1	2	3
Fully communicated vision and mission	5.0	5.0	5.0
Highly compliant people	4.8	5.0	5.0
Well documented consistency	4.6	4.6	4.0
Adaptability to changes	4.3	4.6	5.0
Well disseminated hazards and risks info	5.0	5.0	5.0

Legend: 5-Strongly Agree; 4-Agree; 3-Neutral, 2-Disagree, 1-Strongly Disagree

Ocular observations conducted further validated the different levels of food safety culture maturity being manifested by each enterprise. The first enterprise was found to be in the 'Stage 4 – Predict' of food safety culture maturity. Leaders of the enterprise made great effort to promulgate a positive food safety culture within the organization. They actively looked for the latest technologies and systems regarding food safety.

The second enterprise was in the middle stages of food safety culture maturity, that is, between Stage 3 – 'React' and Stage 4 – 'Know of'. Leaders of the enterprise were aware of the food safety management systems and tried to implement these in their organization. Employees were also aware of the food safety practices necessary in their line of work and their responsibility in producing safe food. However, there was a lack of consistency within the organization with regard to conveying knowledge on food safety from management to employees as the organization does not have written policies on monitoring and evaluation of company adherence to food safety standards. It also had no clear policy on training new employees on food safety protocols.

The third enterprise was in Stage 2 – 'React' of food safety culture maturity. Employees were reliant on instruction from their supervisors/managers regarding food safety practices. Stricter implementation of food safety policies is still needed to improve the food safety culture in the organization. Management must develop means of teaching its employees the value of food safety and the corresponding protocols. This can be done by requiring existing and new employees to undergo training on

[163] Filipino word which means a frequent or loyal customer or a long standing customer

food safety standards and protocols to allow for the greater internalization, it may also be necessary for the cooperative to include food safety among its business objectives.

Value Addition along the Cacao Value Chain

The cacao value chain consists of five activities namely: a) input provision; b) cacao production; c) trading; d) processing; and e) distribution. Input provision includes procurement of farming materials such as fertilizers, pesticides, and seedlings. Cacao production includes all activities from soil preparation to drying of harvested cacao beans. Trading refers to transactions between cacao producers and processors. Furthermore, processing includes activities from reception of dried fermented cacao beans to packaging of chocolate products. The final activity in the value chain, distribution, refers to the mode in which final chocolate products reach the end consumers. Value addition was highest in processing based on the profit margins of the first two enterprises. This can be attributed to low production cost and high selling prices. Value addition has also served as motivation for cacao producers to remain in cacao production for the third enterprise.

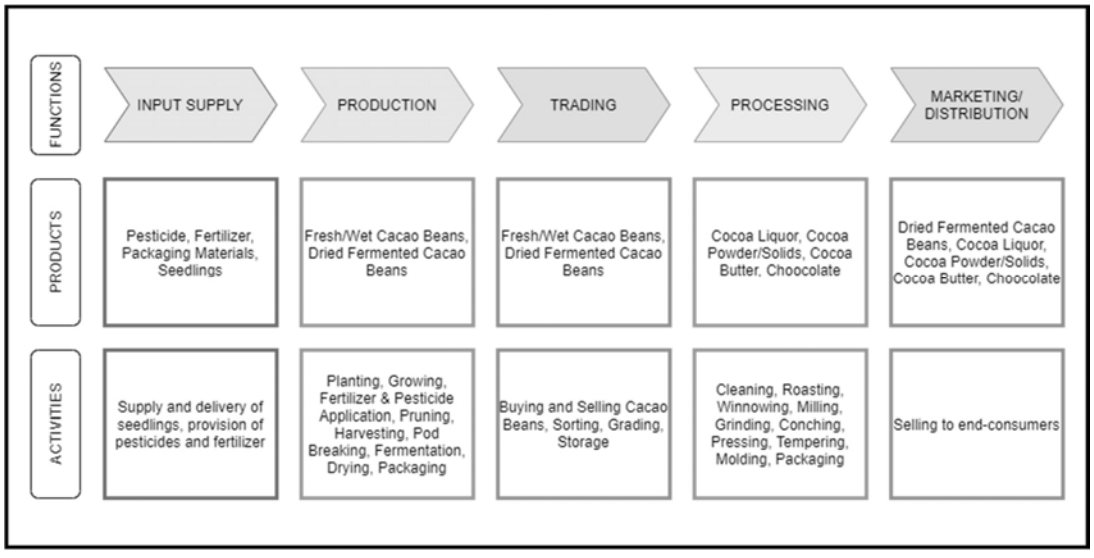

Figure 1. Value Addition Flowchart of Cacao

Food Safety Practices Along the Cacao Value Chain

Food safety compliance is related to the concentration of actors on either end of the supply chain according to a framework by Gereffi & Lee (2009). For the three enterprises studied, compliance to food safety standards was highly driven by the market/buyer side of the chain. The first enterprise ensured food safety compliance by monitoring the entire chain for chocolate production, from input provision to distribution. The third enterprise also managed the entire chain in order to meet the demands of their buyers (e.g. buyer that manufactures chocolate and exports to China). The second enterprise did not directly manage cacao production in their chain. However, since they were in a *suki* (loyal) relationship with their suppliers [the cacao farmers] by which the cacao farmers followed even stricter food safety standards in order to meet the requirements of the chocolate enterprise.

Food Safety Compliance in relation to the Critical Control Points

In terms of compliance to food safety standards as aligned with the critical control points, lack of necessary equipment and consistency in compliance to food safety policies and protocols were some of the issues discovered. Farmers' practices relied heavily on extensive experience than on properly documented procedures during cacao production. Lack of food safety control equipment as moisture meters was pointed. As testing the moisture content of dried fermented cacao beans is crucial in reducing the risk of mold growth in the cacao beans during storage.

On the other hand, Enterprise 1 employed more food safety precautions, such as wearing of hazmat suits inside the processing areas, as compared to the other enterprises. Posters reminding employees of food safety policies were also present at the factory. Enterprise 2 was able to follow minimum requirements set by the Food and Development Authority (FDA) but there were no written food safety policies available. Employees did not have a basis for verifying and monitoring food safety practices within the organization. Processing areas of Enterprise 3 were open to visitors that allowed opportunities for cross-contamination. The roasting area was located near a restroom that can be easily accessed by visitors. Employees sorting

dried fermented cacao beans can be seen following the protocol of wearing gloves and hairnets, however, compliance with the protocol was observed to be inconsistent.

Conclusion and Recommendations

The success of food safety management and compliance strongly adheres to the stage of maturity of the organization food safety culture. Aligned vision and mission must be cascaded throughout the organization in terms of formal food safety policies and protocols. Proper training of employees in the area of food safety is necessary for strong compliance. Remedial training for employees could be given to ensure proper understanding, appreciation, and implementation of food safety policies, especially regarding maintenance of surroundings of food processing areas.

Positive food safety culture can be sustained by installing posters and reminders on food safety policies and guidelines. Consistent supervision ensures implementation and adherence to food safety policies and protocols, especially on proper outerwear and personnel hygiene. Managers must also take additional/rigorous training on international food safety standards and in conducting cost-benefit analysis of adapting such food safety standards in exchange for gaining access to export markets. With appropriate knowledge on food safety, managers will be able to develop or acquire comprehensive and advance food safety management system (FSMS).

The enterprises may opt for accreditation from established FSMSs, such as the ISO22000, to ensure proper monitoring of their FSMS. ISO 22000 require the organization to have a fully documented and implemented FSMS. Formulation of written food safety policies (formal FSMS) will help ensure consistent monitoring and evaluation of food safety practices.

LGUs may support these small enterprises by investing in mechanical dryers for cacao farmers/processors. Mechanical dryers shorten the cacao production process. However, wood-fired oven dryers are not recommended since the smoke emitted by such affects the aroma and taste of the cacao beans. Thus, the mode of heat transfer must be considered when investing in a dryer.

Finally, to further improve the competence and reliability of the selected enterprises in the cacao industry, especially in the global market, an organized traceability system would guide them in their operations. Traceability allows an individual to follow the movement of a food product along the supply chain through documentation and tracking procedures (Aung & Chang, 2014). Implementation may be done through (1) external consultant, (2) empowering and training qualified employee, (3) hiring a person qualified to provide such expertise. In doing so, infusion of resources is inevitable thus, enterprises in the same industry who will work on this together will benefit from economies of scale.

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