Artificial Intelligent Application in Discovering the Japanese Manufacturing Market for Indonesia’s Policy.

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Abstract

Japan is one of the biggest Indonesian market destinations. But in 2018 the World Bank reporting Indonesia is at the 11th position of exporting food to Japan left behind Thailand, Brazil, and Vietnam. The biggest obstacle for the Indonesian manufacturing industry arrived in Japan market is dealing with the food safety and health standards. PT. Bellfood became the first Indonesian producer of processed food entering the Japanese market in 2018. This paper aimed to identify Japanese food safety policy implementation that affected Indonesia’s food industry to access Japan market. This paper used the VosViewer application to find the research gap. Data collection used the library research method. The authors selected 23 publications by Mendeley that concerned with Japan Food Safety as the keyword. The liberal perspective of IPE examines the Japanese food safety management system under the Food Sanitation Act has internalized international trade standards. The national provisions concerning safety and quality assurance refers to HACCP and ISO 20200. Import processed food products entering the Japanese market should own certification of ISO 9001 quality management system, ISO 22000 Food Safety Management System, and Halal Assurance System 23000 as good practice implemented by PT. Bellfood.

Keyword: Japan Food Safety, HACCP, Halal, ISO, Manufacturing Industry

1. Introduction

Indonesia is on the way to develop a manufacturing sector with regional competitiveness. The 4IR approach is used as a revitalization of the manufacturing sector to achieve Indonesia's target as one of the 10 world's economic powers. 4IR covers a wide range of technologies sophisticated, such as artificial intelligence (AI), the Internet of Things (IoT), wearables, advanced robotics, and 3D printing. The Indonesian government is focused on the five main sectors for early adoption of this technology. The five sectors that are considered to have regional competitiveness are the (i) food and beverage industry, (ii) textiles and clothing, (iii) automotive, (iv) chemistry, and (v) electronics. This sector was selected to be the focus after going through economic impact evaluation and implementation eligibility criteria include GDP size, trade, the potential impact on other industries, the amount of investment, and speed of market penetration. The Ministry of Industry has drawn up a road map for 'Making Indonesia 4.0' as a strategy to increase industrial competitiveness in the global market. The food and beverage industry is in the first place supporting national income by 29 percent of manufacturing GDP. It contributes 24 percent of Indonesia's overall manufacturing exports. As many as 33 percent of workers in the manufacturing sector are in the food and beverage industry [1]. Indonesia has a strategic position as a global production base in Southeast Asia. The manufacturing sector for Indonesia is the driving force for the economy and contributes the most to non-oil and gas revenues. Based on data from the Ministry of Industry in 2016, 90 percent of Indonesia's exports came from the non-oil and gas sector. Furthermore, the role of the industrial sub-sector towards non-oil and gas exports was 83.57 percent and the role of the industrial sub-sector towards Indonesian exports as a whole was 75.99 percent [2]. The China, United States, and Japan are the top 3 (three) traditional markets of Indonesian manufacture products.
Meanwhile, Indonesian imported food to Japan experienced a technical barrier. The Agricultural Attache of the Indonesian Embassy in Tokyo, Sri Nuryanti, explained to the media on April 1, 2019, that the realization of Indonesia's exports for livestock products still reached 3 percent of the total export potential. Even though five business units hold export permits for processed poultry meat products to Japan, they have not been able to place Indonesia as one of the top 20 countries of origin for exports of food crops and livestock products in Japan. The biggest obstacle for the Indonesian manufacturing industry to reach the Japanese market is dealing with the food safety and health standards of the Japanese government [3]. PT. Bellfood became the first Indonesian producer of processed chicken (nuggets) food to successfully penetrate the Japanese market in 2018 [4]. Based on data from the World Bank in 2018, Indonesia is in the 11th position of exporting food to Japan left behind Thailand, Brazil and Vietnam. Indonesian commodities that are in great demand by Japanese consumers consist of vegetable oils and fats, pepper, and sweet potatoes. The vegetable oil in large demand is palm oil, coconut oil, and other types of vegetable oil, including margarine [5]. Global trade and international trade agreements acquired the capacity of governments to monitor and to protect public health, to regulate the safety management of food products, and to ensure environmental well-being for its citizen. Based on research, some countries such as the United States, European Union, China, and Japan are concerned about the adverse effects of imported food [6]–[9]. The government needs to take strategic political decisions to protect the public interest even though each party considers advantage and disadvantage perspectives [10], [11]. The Japanese government's policy of prioritizing maximum protection for the health of citizens is considered a rational decision [8], [12].

Indonesia imported food manufacturing industry need to concern about technical procedures and standard of trade in destination countries. Since the WTO members agreed on the Agreements on Technical Barriers to Trade – TBT, the government allowed to release technical measures, standards and regulations as long as it a concern to protect humans, animals, plants, health, the environment, and the interests of consumers [13]. The complement of food safety and quality certification as national regulation for imported food may become the opportunity to enter the foreign market [14], [15]. Thus, this paper aims to (1) identify Japanese food safety policies that must be understood by importers, (2) How to harmonize safety standards and food import certification that must be applied by producers in Indonesia to be able to access the Japanese market. This research contributes to supporting the realization of Indonesia Making 4.0 dealing with increasing the competitiveness of the food industry in the global market.

2. Methodology

This research applied a descriptive qualitative approach based on document and content analysis. The primary data sources were obtained from the literature review on government reports, official documents, and official websites that published the Japanese imported food policy released by FAO, MHLW, and CAA. Secondary data sources were obtained from contextual analysis of research content and research publications. Data selection used 'publish and perish' – an application of data collecting to find a relevant online publication by keywords ‘Japan Food Safety’ and ‘Indonesia Imported Food’. Those research publications have been categorized based on the topics concerned on Japan Food Safety Policy - discuss the treatment and issue on imported food entering the Japanese market.

Based on the perspective of the international political economy, Japanese trade regulations on imported food become the unit of analysis. Technical analysis verified the result of library research by comparing to journal publications and official reports related to the implementation of Japanese food safety, measures, and certification of Indonesian food products, particularly the experience of PT. Bellfood is a good practice.

3. The Japanese Regulation on Food Safety Management System

The authors list prominent keywords to clustering data text such as safety standards and quality of imported food products, Japanese food safety policies, politics and public health, food safety issues.
in Japan, and Indonesian imported products in the Japanese market. By using the ‘publish and perish’ application, it selected 23 relevant journals. Data analysis used VosViewer application input “Japan Food Safety” as keyword relationship mentioned 9 (nine) variables that show verified co-occurrence keywords (Figure 1). In this study, the Japanese government has implemented a national standard on imported processed food which refers to food safety and quality policies.

**Figure 1. Co-occurrence Data Text**

The bibliometrics analysis mentioned by the VosViewer research cluster in Figure 2 found that most research has focused on Japan's food safety policy but relatively few studies address the technical requirements of trading with HACCP certification. This proved that the results of this study will be able to help the manufacturing industry in the food-beverage sector make adjustments to bridge this standard difference so as not to become a trade barrier. This is mainly related to understanding the food safety policies and technical procedures in destination countries.

This research examines the Japanese government in applying high-quality standards of the imported food management system to ensure its citizen consumes safety product. The Japanese government is concerned on public health as similar to the implemented policies in the United Kingdom and European Union countries. The frozen food manufacturing industry must complete international trade certification that ensures the safety and quality standard on production and hygiene products [14].

The safety quality certification is mandatory for imported food manufacturing products. It originates mentioned in the statutory provisions of the Japan Food Sanitation Act. All importers are required to comply with the provisions of point five concerning "imported food" in 7 (seven) provisions of the Ministry of Health, Labor and Welfare (MHLW), which consists of; 1) Wide-area food poisoning incident response. The coordination and cooperation between MHLW and local government to manage and to prevent outbreak and expansion of food poisoning, 2) Food hygiene based on HACCP principles. A hygiene control system to control hazards such as contamination of pathogenic microorganisms, foreign objects, etc from receiving raw material to shipping final products, 3) Notification of health damage incident. In case these incidents are caused by ingredients and components designated by MHLW, the food business operators are required to notify the case to the government, 4) Food containers and packaging. Introduce a positive list system for food containers and packaging. Only substances with that safety evaluated are allowed to be used, 5) Notification system and licensing system. To create a notification system for food businesses and to review business types requiring licenses, 6) Obligation to notify food recall information to the government. To establish a mechanism for food business operators to report recall information to the government. And for government to provide this information to public through the website, 7) Import and export food safety certification. To ensure the safety of imported food, require hygiene control with HACCP, health certificate for the dairy and seafood products. To create a legal provision of food export [16]. The restructuring of Japan framework of food safety has been started in 2003. It established the Japanese risk assessment body and risk management body. The risk assessment body is placed into the Food Safety Commission (FSC) established in the Cabinet Office under the Food Safety Basic Act. Moreover, risk management for food safety in Japan is conducted by three agencies; the Ministry of Health, Labour and Welfare (MHLW),
the Ministry of Agriculture, Forestry and Fisheries (MAFF), and the Consumer Affairs Agency (CAA). They have responsibilities for developing necessary measures and regulations based on risk assessment results. Risk communication is done by all these agencies.

4. The Harmonization of Food Industry for Accessing Japan Market

National standards in destination countries concerning safety and quality certification for imported food products give the challenge and opportunity for producers. One would agree that food safety and quality certification gives consumers the confidence to buy imported products. It ensures the company’s prestige and chance to compete in international exchanges. On the other hand, the complexity of procedures and standards implemented in foreign countries seems to be a political economy instrument to protect domestic producers. Thus, it is significant for companies to understand and implementing quality and safety certification based on the standard of foreign markets. This research examines the harmonization of food safety and quality management of PT. Bellfood to access Japanese market in 2018;

5. HACCP

The Hazard Analysis and Critical Control Point (HACCP) is one of the international standards that are applied in the United States, European Union, China, Australia, and ASEAN markets. HACCP is a systematic approach to the identification, evaluation, and control of food safety hazards. It was adopted by the U.S government on August 14, 1997. To assure food safety, the HACCP systems designed the food industry to consider the existence of chemical and physical hazards in addition to other biological hazards. The HACCP system is applied to each product or process. They identified potential hazards in the production process. After potential hazards are identified, control is taken to ensure that hazards cause as little damage as possible. There are seven principles of HACCP that have been universally accepted by government agencies, trade associations, and the food industry around the world - (1) Conduct a hazard analysis, (2) Determine the critical control points (CCPs), (3) Establish critical limits, (4) Establish monitoring procedures, (5) Establish corrective actions, (6) Establish verification procedures, (7) Establish record-keeping and documentation procedures.

“HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement, and handling, to manufacturing, distribution, and consumption of the finished product. For successful implementation of a HACCP plan, management must be strongly committed to the HACCP concept. HACCP is designed for use in all segments of the food industry from growing, harvesting, processing, manufacturing, distributing, and merchandising to preparing food for consumption. Prerequisite programs such as current Good Manufacturing Practices (cGMPs) are an essential foundation for the development and implementation of successful HACCP plans. Food safety systems based on the HACCP principles have been successfully applied in food processing plants, retail food stores, and foodservice operations.” [17]

Japan’s Ministry of Health, Labour, and Welfare announced the mandatory implementation of the HACCP program for the food industry in 2018. It is mentioned in the Food Sanitation Law revision. This policy was released to welcome the upcoming Tokyo Olympics and Paralympic Games. According to Nigel Asai - HACCP Japan Chief, Japan’s manufacturing industries have applied a high understanding of food safety control, but the major issue is about different methods and standards are used. By implementing HACCP, it hopes that Japanese food products can compete with the US and gain international recognition. The safety quality certification has been the consideration of Chinese [18] and Indian [19] business sectors to compete in global markets.

For an example of the policy implementation on Japan food safety and quality standard, experienced by Philippines export commodities. The institutionalization of HACCP and Food Hygiene in the Philippines food industry is very important to support the export of tuna, crustaceans, fresh fruits, fruit extracts, sugar, and sweeteners to Japan. Japan is the second-largest partner of the Philippines food
market. Since the sign of the Philippines-Japan Economic Partnership Agreement (PJEPA) in 2006, 78% of Philippines coconut export to Japan. Banana (32%) and Pineapple (33%) become the Japanese favorite fruits imported from the Philippines. Referring to the implementation of the Food Sanitation Law in Japan, the HACCP standard is also useful for knowing which food products enter the Japanese market contain permitted agricultural residues. Related to Miura, et. al (2017) investigating the Japan Agricultural Quarantine Agency (MHLW) from 2012 to 2017, found the fact that the highest import violations were related to 3,018 cases of agricultural pesticide residues [12]. Thus, the food import procedures involve production, and hygiene standard certification is a Japanese strategy to protect citizens from the disadvantages of trade liberalization.

“Regional Bureaus of Health and Welfare register and inspect facilities introducing HACCP (Hazard Analysis and Critical Control Point) in cooperation with local governments and provide technical advice for hygienic practices based on HACCP approach. The Regional Bureaus of Health and Welfare are located in seven regions across the country: Hokkaido, Tohoku, Kanto-Shinetsu, Tokai-Hokuriku, Kinki, Chugoku-Shikoku, and Kyushu. They register private laboratories as “Registered Laboratories” which operate food inspection business in compliance with GLP (Good Laboratory Practice) under the Food Sanitation Act. There are 32 quarantine stations located at international seaports and airports. At the quarantine stations, food inspectors conduct document examination, inspect and monitor imported foods and related products, and guide importers on practical procedures of food import.”

Product safety and quality certifications have come to the fore in the manufacturing industry. National policies in developed countries in the implementation of security and quality assurance of imported products often become obstacles for developing or less developed countries. Geographical differences, the application of technology, public education, and the rule of law affects the implementation of trade standardization policies in each country. However, manufacturing companies also benefit from having quality and safety certificates because they can increase consumer confidence and product competitiveness in the foreign market.

5.1 ISO 20200

ISO 22000 is known as a food safety management system. This standard was developed by IOS, the International Organization for Standardization in 2005. As a global standard, this standard is related to food safety, which is related to the hazards that food brings when it is consumed by humans. This food safety risk can appear in several levels: low risk - medium risk - high risk. Therefore it is necessary to have appropriate hazard control and need to be implemented by the manufacturing industry. Hazard control used in ISO 22000 refers to the principles of HACCP and the implementation steps are adopting the Codex Alimentarius Commission [20], [21]. In general, some of the key elements in ISO 22000 involves 1) Interactive communication. Communication along the food production process chain is essential to identify and control food safety hazards that arise at every stage of the production process. This communication is carried out in two directions in the organization, upstream and downstream. Communication between producers and suppliers and customers is also very helpful in the overall hazards analysis, 2) System management. It is necessary to have a food safety system that is designed, operated, and updated within a structured management framework of an organization. 3) Hazard control. An activity to identify and control food hazards to an acceptable level that may appear in end products. These activities are contained in a pre-requisite program and HACCP plan [22, pp. 22–23].

The application of ISO 22000 certification in the manufacturing industry aimed to provide the safe product by ensuring hazard control in the food supply chain. This standard can be applied independently or to be integrated with other standards such as ISO 9001. ISO 22000 specifies requirements are the organization/manufacturer needs to: 1) Demonstrate the ability to control food safety hazards to ensure safe end products, to meet customer’s requirements, and food safety regulations, 2) Aims customer satisfaction through continual improvements and effective control of food safety hazards [22, p. 21]. All producers who wish to obtain ISO 22000 certification must first carry out
identification and gap analysis to determine the advantages-disadvantages-opportunities-threats of their management system. This identification and gap analysis can be done by requesting assistance from a system certification body as a consultant so that investment and implementation of the ISO 22000 food safety management system can be more focused and monitored.

5.2 Safe Quality Food Certification

The objective of SQF certification is to ensure the processes of (1) Primary production; (2) Food manufacturing; (3) Storage and distribution; (4) Food packaging manufacturing; and (5) Retail operations comply with the supply chain management based on international safety and quality standards. The SQF Program is recognized by the Global Food Safety Initiative (GFSI). The Global Food Safety Initiative is a group of food safety management system certifications that are recognized globally or globally. The certifications included in the GFSI include: 1) BRC global standards for food safety, 2) FSSC ISO 22000, 3) Safe Quality Food (SQF), etc. In the case of PT Bellfoods, it has implemented several management systems, including ISO 9001 quality management system, ISO 22000 Food Safety System Certification (FSSC), and Halal Assurance System 23000. So that in 2018 PT Bellfoods has successfully made its first export to Japan with a volume of one container or the equivalent of 6 tons [4]. The practice of food policy dealing with agricultural products in developing country promoted by FAO and WTO. Trade requirements for food products generally cover 7 (seven) aspects, including safety, quality, recognition of the origin of production, methods used, ethics of worker welfare, administrative information, and documentation. These requirements must be attached since the pre-harvest process [23]. Manufacturing companies must understand the application of regulations on sanitation and phytosanitary (SPS) in the destination country in order to ensure food safety and to prevent the spread of pests or diseases among animals and plants. These sanitary and phytosanitary measures can take many forms, such as requiring products to come from disease-free areas, inspection of products, treatment or processing of certain products, setting the maximum allowable residue levels of pesticides, or using only certain permitted additives in food [24].

6. Conclusion

Based on the research results, the regulation on Japanese food safety is a national policy under the authority of four institutions. There are three stages, 1) risk assessment, 2) risk management, and 3) communication. Companies that import food to Japan are required to comply with the provisions of the MHLW which refers to the Food Sanitation Act. In import-export practices, the national provisions concerning the safety and quality assurance of Japanese food refer to at least 2 (two) international standards, such as HACCP and ISO 20200. Referring to the perspective of the Japanese government on product safety, producers who wish to import processed food products to Japan, it is advisable to have certification 1) ISO 9001 quality management system, 2) ISO 22000 Food Safety Management System, 3) Halal Assurance System 23000 as good practices implemented by PT. Bellfood.

Thus, the authors believe that the strength of the food industry which has the potential for export lies in the extent to which the manufacturing companies’ capacity to adapt to the development of the international trade system. This relies on knowledge of regulations, standards, and certifications that are recognized as prerequisites for imports to the destination country. Processed food manufacturers must implement a manufacturing management system that is globally recognized. Every manufacturing industry that targets market goals in other countries, must at least implement a quality management system (ISO 9001 quality management system), an occupational health and safety management system (ISO 45001 health and safety management system), and an environmental management system (ISO 14001 environment management). Especially for the processed food industry, it should be equipped with a food safety management system (Food Safety Management System ISO 22000 or equivalent) and if the goal of the producer is to meet the eligibility of Muslim consumers, halal certification (Halal Assurance System 23000) is a must. Furthermore, the implementation of the various
manufacturing management systems mentioned above still takes into account the national regulations of the export destination countries.

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