

# ANALYSIS OF FOOD QUALITY MANAGEMENT SYSTEM IMPLEMENTATION ISO 22000 FOR PRODUCT SUSTAINABILITY IN PATIHAN LAMONGAN VILLAGE

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**Abstract.** Lamongan is the largest sorghum producer in East Java. Patihan Village, Babat sub-district, is one of the sorghum-producing centers where the community already has post-harvest skills and processes sorghum into various food products. Standards are documented both the process, the origin of raw materials, as well as organoleptic factors related to quality; so that after the activity changes are obtained in the form of; the quality standard of sorghum flour produced from Patihana village will be in accordance with the criteria that have been determined together. Empowerment of sorghum processing groups through the application of the ISO 22000 food management system in a simple way becomes an urgent need so that various foods from sorghum produced are known and trusted as quality products by consumers and reach a wide market. adults and the elderly), biscuits and so on with the specifications of the final product favored by consumers in general. The activities are designed in the form of an approach (socialization) to instill strong quality awareness, commitment and consistency in the production process. Further improvements are made together with the management of the production process, the application of traceability, sanitation, hygiene, documentation, packaging documentation, ISO wiring 22000. The method used is through qualitative descriptive research through: 1) Study Changes to the FSSC 22000 Food Safety Management System, 2) Gap Assessment and Analysis Before Improvement 3) Determination of Changes Action Recommendations, 4) Gap Analysis After Improvement. Based on this study, prior to the improvement the sorghum processing group had implemented the requirements of FSSC 22000 version 4.1 by 50%. Corrective action using risk analysis was carried out for upgrading FSSC 22000. The success of the corrective action was proven by the results of the 80.5% gap analysis. The result of the activity was a significant change. Manage the production process for the better, sanitary and hygienic and have quality documents to be implemented carried out with commitment and consistency

**Keywords:** food management ISO 22000; sustainability of processed sorghum products

## I. INTRODUCTION

Lamongan is one of the largest sorghum producing centers in East Java. Media Indonesia daily reported that the productivity of sorghum land was 6.5 tons/ha, exceeding the national production target. The national target for sorghum productivity is only 2-3 tons per ha. Lamongan Regency has a planting area of 560 Ha. Sorghum is a plant that requires minimal maintenance, drought resistance, low production costs, and is integrated with livestock. Sorghum farmers in Patihan village are part of the Lamongan sorghum production. Sorghum is planted once a year in the dry season (July to October). abundant productivity tends to reduce the selling price of farmer's sorghum in the range of 2000 to 3000 per kilogram; Therefore, strengthening the aspects of the production process so that farmer families are able to process sorghum independently is very important so that farmers are empowered from the entanglement of middlemen [1]. There are 23 families of sorghum farmers as members of the Patihan village community who are recorded to have the ability to process sorghum well. The rest, there are still many members of the local community who have the ability to process sorghum for their own consumption as a substitute for rice. Partners are now able to make various preparations, but the production of processed sorghum

produced is only in limited quantities, and is still on a local and regional scale because market confidence to buy processed sorghum from farmer families is still very low. The introduction to the ability to create products has not been balanced with an understanding of the aspects of implementing good and correct quality management; so that market competitiveness, consumer confidence and product marketing reach are still very limited. This is what causes the household-scale industry in Patihan village to not develop, even though it is still controlled by middlemen in the marketing process of harvesting sorghum. One of the keys to gaining market trust is the existence of certified ISO 22000 quality documents, in addition to broad marketing efforts through promotions and online media networks [2]. High productivity of harvested sorghum requires a very broad market so that people are economically empowered; and free from the dependence of middlemen who act as suppliers and controllers of the market price of sorghum to small and medium-sized industries. The implementation of ISO 22000 quality is believed to create the independence of farmer families in processing sorghum, as well as to provide direct income distribution for rural communities, and at the same time maintain its sustainability as a regional superior product [2].

In the competition in the era of globalization, the application of these two standards will help companies control various aspects related to food quality and safety [3]. This includes elements of potential hazards and critical parameters for food chain activities, product and service suitability in a systematic, comprehensive and directed manner towards continuous improvement [4]. In principle, the Quality Management System and the Food Safety System have the same control objectives, namely "processes" with different contexts for the same general purpose, namely: meeting the requirements of laws and regulations, customers (consumers). Referring to the management system method known as PDCA (Plan – Do – Check – Action), the implementation of a Quality Management System and a Food Safety System, theoretically can be implemented in an integrated manner in an integrated management system [5]. Based on these principles, an integrated Food Quality and Safety Management System model for processing various sorghum foods can be developed. To integrate these two management systems, attention and a very important role is the method of integrating the two systems because it will determine the quality of the integrated management system [6].

The ability of farmer families to make good sorghum flour and processing it into quality food; the food can actually be developed into a Patihan Village-Owned Business Entity. BUMDES that grows from expertise, skills and diversification of standardized product development can increase people's economic income, create sustainable jobs, improve community welfare, and foster continuous innovation and creativity to develop themselves through sorghum processing.

Healthy and safe food is an important factor to improve the health status of the community, therefore the quality and safety of food both biologically, chemically and physically must always be maintained, so that people as users of these food products can avoid diseases due to food or foodborne diseases and or food poisoning [7]. From poisoning cases it is proven that food quality and safety problems are becoming increasingly important and need special supervision and control. Recently, the demand for quality assurance and food safety continues to increase in line with public awareness of the quality and safety of the food consumed [7]. Supervision and control of the quality of the final product test is not balanced with the rapid progress of the food industry. In addition, it does not guarantee the safety of food circulating in the market and consumed by users of catering services. Therefore, it is necessary to develop a food safety assurance system that focuses more on effective preventive measures [8].

Without food safety which is a basic requirement for the production of a food product, food quality cannot be discussed. However, there are some very important aspects that cannot be ignored, among others, is that the food will not be sold if the appearance, taste and aroma do not match the wishes of the customer and do not meet customer satisfaction. Aspects such as these can only be found and regulated in the Quality Management System [9]. To achieve

these 2 aspects, an integrated or integrated system is needed that can be applied in a catering company based on international standards, namely the Quality Management System and the Food Safety System [10].

In connection with the International Standardization of food chain supply activities, Quality Management Standards and Food Safety Standards are applied. In competition in the era of globalization, the application of these two standards will help companies control various aspects related to food quality and safety. This includes elements of potential hazards and critical parameters for food chain activities, product and service suitability in a systematic, comprehensive and directed manner towards continuous improvement [11].

In principle, the Quality Management System and the Food Safety System have the same control objectives, namely "processes" with different contexts for the same general purpose, namely: meeting the requirements of laws and regulations, customers (consumers). Referring to the management system method known as PDCA (Plan – Do – Check – Action), the implementation of the Quality Management System, and the Food Safety System, theoretically it can be implemented in an integrated manner in an integrated management system. Based on these principles, an integrated Food Quality and Safety Management System model for food preparation activities in a Catering Company can be developed [5]. To integrate these two management systems, attention and a very important role is the method of integrating the two systems because it will determine the quality of the integrated management system. This research method is descriptive analysis by conducting: In-depth study and analysis of the clauses and elements in the ISO 9001 Quality Management System and ISO 22000 Food Safety Management System and HACCP [2]. Analyzing processes and systems to integrate the two systems into an integrated Food Quality and Safety Management System (SM2KP) model that is acceptable and applicable to the Patihan sorghum processing group being studied. Sorghum (*Sorghum bicolor* L. Moench) is a cereal crop that has the potential to be cultivated both in dry areas and in areas with high rainfall. Various studies have shown the resistance of this plant to dry or flooded conditions. Sorghum can also adapt well to areas with different soil types or areas with toxic soil types. Sorghum plants have been known and cultivated for a long time in several areas in Indonesia such as Central Java, Yogyakarta, East Java, parts of NTB and NTT. Sorghum seeds are one of the important calorie sources as food which reaches 332 calories, total carbohydrates reaching 73.0 g; protein 11.0 g; fat 3.3 g; calcium 28 mg; phosphorus 287 mg; iron 4.4 mg; vitamin B1 0.38 mg [12]. Based on the nutritional value content of sorghum, it is appropriate for this plant to be widely used so that the nutritional needs of the community can be met. However, the consumption of sorghum as a substitute for rice in Indonesia is still very low. Syairozi. [13] stated that sorghum can not only be consumed as a main food but can also be used for bread, tortillas, sorghum pop and also snacks. Sorghum seeds are also widely used for

animal feed either directly or as an additional material for making animal feed. In addition, the carbohydrates contained in the seeds can also be converted into ethanol. Based on the potential possessed by sorghum seeds, its development will be a solution to the food crisis.

## II. RESEARCH METHODS

This research is descriptive analysis by conducting: In-depth study and analysis of the clauses and elements in the ISO 9001 Quality Management System and ISO 22000 Food Safety Management System and HACCP. Analyzing processes and systems to integrate the two systems into an integrated Food Quality and Safety Management System (SM2KP) model that is acceptable and applicable to the catering companies studied. This study uses primary data sources and secondary data. Primary data was collected through interviews and field observations at one of the work units of the sorghum processing group. Secondary data include: (1) Inventory of clauses and elements in the ISO 9001:2000 Quality Management System. (2) Inventory of clauses and elements in the ISO 22000:2005 and HACCP Food Safety Management System. (3) Inventory of the main activity stages in the sorghum processing group, namely the activities of receiving and storing goods, production and services. Literature study by conducting in-depth analysis of clauses and elements of ISO 9001:2000 Quality Management System, ISO 22000:2005 Food Safety Management System and HACCP then combined with data obtained through interviews and field observations. The data is then combined into a Food Quality and Safety Management System (SM2KP) and processed manually using the existing process and system approach which will be carried out by the second researcher with the help of members [2].

The first researcher was assisted by members to carry out several approach methods offered to solve production and partner management problems in processing or producing sorghum flour into products that have high economic value and in managing their business. The approach that will be taken is:

1. Introduction and training of sorghum processing (receiving raw materials/receiving)
2. Introduction and training on storage of raw materials (Storage)
3. Production management and cooking training
4. Marketing and service training.

The work procedures carried out to support the methods offered to partners include:

1. Provide skills training on how to process sorghum into processed products with high economic value and can last longer such as dodol, pie, and sorghum bakpia.
2. Provide training on procedures for packaging processed sorghum products properly and correctly so as to produce products that can provide added value and have attractiveness for buyers.
3. Providing counseling in the form of transforming the mindset of the Women Farmers Group to become

independent entrepreneurs so that they can help the family economy

4. Provide training on production management and marketing of processed sorghum products both conventionally (supermarkets) and marketing through electronic media (internet) so that they have a wider marketing reach.
5. Assisting, monitoring and evaluating during the processing (production) and marketing of processed sorghum products to find out the obstacles faced by the Women Farmers Group so that later they can produce independently.

The targeted achievement indicators are the determination and implementation of Hazard Analysis Critical Control Points in the process of receiving raw materials, storage, production and services that have been implemented according to HACCP and ISO 22000 standards.

## III. RESULTS AND DISCUSSION

Based on the research results obtained through observations and interviews conducted, the analysis obtained includes: The process of inspecting raw materials is carried out by inspection based on the checklist used has shown an effective quality inspection because it includes checking the conformity of specifications and criteria for goods that have been determined in the procedure. raw material inspection. The hazard analysis carried out in the raw material inspection process has not taken into account the potential hazards that may occur during the management of the sorghum plant until the harvesting process. The cooking process is carried out with reference to each standard recipe to ensure product quality conformity has been implemented effectively and in accordance with procedures the quality of the company under study. The hazard analysis carried out in the cooking process has not included the explanations needed in assessing the risk. Although these explanations can be given when referring to the Standard Recipe which already includes cooking methods and temperature and time control for each type of food/menu that is processed. The process of serving food has been carried out effectively and in accordance with existing quality procedures, but based on the author's observations and the results of interviews with the serving officer that during the hot holding process, the temperature of the serving place (bain marie) is 60°C - 70°C with a maximum serving time of 4 hours (according to the company's presentation procedure). This needs to be considered so that the food served is not only safe for consumption but also maintains the quality of taste, aroma, appearance so that it can satisfy customers who consume it. (Critical Limit) so that it is known during the process of receiving, storing, producing (preparing and cooking) and serving (serving) that the critical control point lies in the process of receiving goods, cooking and serving hot (hot holding/hot display) so that the monitoring process can be known, namely what to monitor, how to monitor it, who to monitor and when to monitor and corrective and verification actions taken. These processes are carried out by the

company under study based on the use of raw materials in general or not specific to each menu/food that is processed. Based on the analysis carried out by generalizing the raw materials used, it is assumed that the hazard analysis carried out cannot represent all types of processed dishes because the ingredients used in each type of cuisine will be different and the cooking methods are also different. The sanitation program carried out in the company under study was appropriate and running effectively in accordance with the requirements in the Food Quality and Safety Management System. 6 include the number of available toilets. With 23 groups of processed sorghum with  $\pm 100$  employees,  $\pm 5$  toilets are needed, while only 3 are available. The lights in the production area are not fully protected to prevent them from breaking and falling into the food being processed. The Organizational Structure of the SM2KP Team shows the commitment of the processed sorghum group studied in the implementation of SM2KP because it appears that this team contains only the owners of the processed sorghum group, running effectively because in this organizational structure it does not involve employees at the implementing level in the work unit so that there is no visible form of effective communication in it and forms a separate (sectoral) mindset. Based on this study, before the improvement of the processed sorghum group, 50% of the requirements of FSSC 22000 version 4.1 were applied. Corrective actions using risk analysis were carried out for upgrading FSSC 22000. The success of corrective actions was proven by the results of the 80.5% gap analysis and the passing of the processed sorghum group in the FSSC 22000 upgrading certification. quality to be implemented and implemented with commitment and consistency.

#### IV. CONCLUSION

Based on the results of the study, it was concluded: (1) The Quality Management System in the processed sorghum group studied had been applied in the process of receiving raw materials, storage, production and service. (2) The Food Safety Management System, especially the determination and implementation of Hazard Analysis Critical Control Points in the process of receiving raw materials, storage, production and service has not been fully implemented in accordance with HACCP and ISO 22000 standards. (3) Food Quality and Safety Management System (SM2KP) can be applied effectively and in an integrated manner because the control process carried out can be in line with acceptable standards, applicable and adapted to the conditions, needs and business processes of the company under study (tailor made), its implementation can be carried out with reference to SM2KP model. (4) The standard of storage temperature in the chiller ( $1^{\circ}\text{C} - 4^{\circ}\text{C}$ ) has not been effective to guarantee the quality of the raw materials stored, especially in the additives for processed sorghum such as vegetables and fruit. Suggestions Some improvements that the authors suggest can be applied in the implementation of SM2KP (1) Top management is expected to maintain a balance between the company's goals in improving

production performance with attention to the implementation of SM2KP. (2) Generally the management/organization considers and applies the ISO 9000 quality system and ISO 22000 food safety and HACCP as additional programs, this SM2KP should be an integral part in the overall management system in making decisions and activities of the sorghum processed group in Patihan village not only just to meet customer requirements. (3) Training and awareness programs regarding SM2KP for all employees need to be improved to build employee awareness and understanding of the importance of implementing SM2KP in the workplace. (4) The Team Leader/management representative in SM2KP needs to appoint and select an SM2KP team consisting of various groups of processed Sorghum in Patihan village to be able to monitor and provide opinions according to their field in determining or changing the HACCP Plan. (5) To avoid conflicts between procedures, it is necessary to make several revisions to the documents, including PSO (Standard Operating Procedures), Work Instructions and several forms/checklists and can be applied in an integrated manner. (6) To support the implementation of SM2KP, management needs to provide and complete human resources or several facilities such as: providing 2 types of cold storage (chiller storage) with temperatures of  $1^{\circ}\text{C} - 4^{\circ}\text{C}$  and  $5^{\circ}\text{C} - 8^{\circ}\text{C}$ . (7) Provide a place for washing basic ingredients, additional vegetables and fruit for processing sorghum in the production process area. (8) Provide additional toilets and provision of special toilets for female employees.

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