

Implementation of CPPB-IRT, WISE, and Halal Guarantee System on Bread Production

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ABSTRACT

Bread is food that many consumed in Indonesia. It usually consumed and a substitute for rice. PT. X is an Indonesian company that produces dry bread and wet bread. The company must implement a Good Manufacturing Process (GMP) and Halal Guarantee System (HGS) to ensure the food safety that the company produced. The company is also obliged to pay attention to Occupational Safety and Health in the work environment by applying WISE. This study consists of five staged. The stages include identification of the condition of the company, CPPB inspection, WISE examination, HGS inspection, and proposed improvements in the production process. The results of the study show some elements that have not been fulfilled. These elements include 6 CPPB elements, 9 WISE elements, and 8 HGS elements. The results of the study also provided several studies. Some of the recipients were improvements in the Standart Operational Procedure (SOP) for the receipt and receipt of materials, and the SOP for the receipt and receipt of industrial non-processed materials.



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1. Introduction

The food industry in Surakarta City has a significant role in the economy. The number of food industries is 20 units (15.87%) of all industrial sector. This industry has a workforce of 1,014 people (8.14%) of the total workforce working in the industrial sector [1]. To improve the competitiveness of the food industry, employers must implement food safety and Occupational Safety and Health (OSH). Food safety needs to be considered by consumers. Consumers avoid things that are harmful when consuming food products [2-8]. OSH needs to be considered to prevent work accidents [8, 9]. In addition to paying attention to food safety and OSH, the food industry also consider halal factors. Halal food is not only consumed by Muslim consumers but also consumed by non-Islamic consumers. The concept of halal is not only concerned with aspects of religion but cleanliness and health [10, 11]. Therefore, the state should provide protection and guarantees to the public regarding product halalness [12, 13].



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Food safety, halal guarantee, and Occupational Safety and Health (OSH) in Small Medium Enterprise (SME) are interest to study. Research on the procedure of food products for home industries has been carried out by several researchers. In Indonesia, this problem is abbreviated CPPB-IRT. Some previous research has conducted by [Sonaru, et al. \[2\]](#), [Wijayant and Laeliocattleya \[3\]](#) also [Herlambang, et al. \[4\]](#). Their aims of the study are to achieve is to analyze the incompatibility of CPPB-IRT requirements in the production process in the SME. Some researchers attempt to identify potential hazards in the work environment as a basis for making work improvements. That research has conducted by [Made \[8\]](#), [Suhardi, et al. \[9\]](#), [Rahayu, et al. \[14\]](#), [Rohmawan and Restuputri \[15\]](#), and [Islami \[16\]](#). The difference in research conducted by these researchers is on methods for identifying potential hazards. Moreover, Moreover, the investigation of halal product issues have been carried out by [Backhouse and Mohamad \[17\]](#) and [Ma'rifat and Sari \[18\]](#). The purpose of the study was to find out the application of the halal guarantee system in the food industry. [Putri, et al. \[19\]](#) and [Septina, et al. \[20\]](#) have conducted research that combined more than one method. They combined the CPPB-IRT approach and halal certificate on SME food. [Damarasri \[21\]](#) dan [Suhardi, et al. \[16\]](#) attempt to combine the CPPB method and Work Improvement in Small Enterprise (WISE).

One of the food industries in Surakarta City is the bakery. Generally, there are many differences in the production floor with CPPB standards and the implementation of OSH. These incompatibilities include 1) dusty walls in the production room, 2) no chimneys to air circulation, and 3) workers in the production do not use personal protective equipment. This condition causes food to be contaminated. To expand its product marketing, companies must implement food safety standards. Furthermore, companies must attend to OSH issues on production. Moreover, companies must pay attention to halal products. Halal labels on packaging increase Indonesian people's trust. Halal certificates are needed to differentiate halal products from non-halal products [\[17\]](#).

Several studies have been conducted before by researchers. However, the difference in this research with previous research is about the use of methods and scope of discussion. This study attempts to combine three methods such: CPPB, OSH, and halal guarantee. No previous research has combined these three methods. The purpose of this study is to propose improvements in bread making based on CPPB, OSH, and halal guarantee certificates (HGS).

2. Methods

2.1 Research framework

The research framework for improving the production process is shown in [Fig. 1](#). Some of these stages were described included 1) Study of literature; 2) Evaluate nonconformities using CPPB, WISE, and HGS; 3) Summarizes the results of nonconformities based on CPPB, WISE, and HGS; 4) The selection of improvement priorities with the Delphi method, and 5) Proposed improvements.

2.1.1 Study of literature

This stage was done to obtain the literature to solve the problem. The literature used includes books and journals related to CPPB, OSH, and HGS. This CPPB was based on guidelines issued by The National Agency of Drug and Food Control of the Republic of Indonesia (BPOM). OSH Literature used the Work Improvement in Small Enterprise

(WISE) guide. Moreover, HGS was based on a guide from the Council of Ulama Republic of Indonesia (LP-POM MUI).

2.1.2 Evaluate nonconformities using CPPB, WISE, and HGS

The CPPB evaluation procedure was carried out by interviews and direct observation in the company. In this investigation, there were 14 criteria evaluated [2-7]. A portion of the CPPB checklist is shown in Table 1.

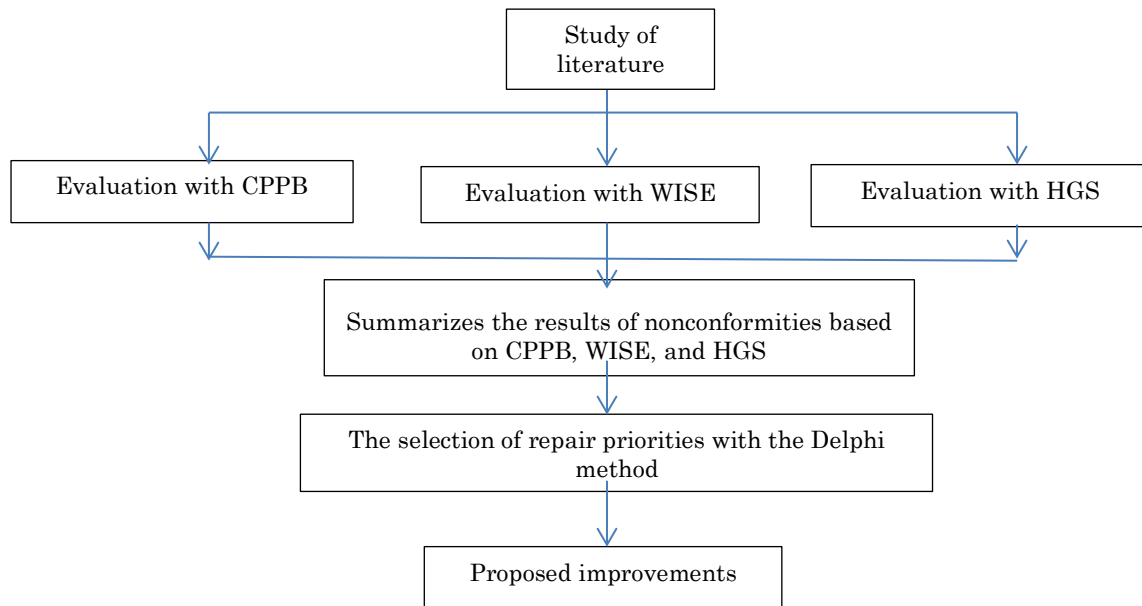


Fig. 1. Research Framework

Table 1. Checklist of CPPB

No	Elements Checked	Current Condition	Mismatch			
			MI	MA	SE	CR
A	Location and Production Environment					
1	The location and environment are not maintained, dirty, and dusty	Well maintained corporate environment There is no rubbish pile The trash can is closed				
B	Building and Facility					
2	The production area is narrow, difficult to clean, and is used to produce products other than food					

We attempt to assess the bakery company based on the CPPB checklist. We wrote the current conditions in the bakery company based on the elements examined. If it finds a discrepancy, we gave a \surd sign in the mismatching column. There are four discrepancies included minor (MI), major (MA), serious (SE) and critical (CR). In minor nonconformities, if the MI is not fulfilled, it gives potential influence on product quality. In major nonconformities, if this is not met, it affects the efficiency of product safety control. In

Serious non-compliance, if not fulfilled, it affects product safety. If Critical mismatch not met, it has an impact on product safety directly. The critical mismatch is a requirement that must be fulfilled.

There are eight aspects evaluated by using the WISE checklist [16, 21]. A portion of the WISE checklist is shown in Fig. 2. Evaluation procedures used the WISE checklist are as follows: (1) Determine the work area examined, (2) Take a few minutes to go around and observe around the work area, (3) For each action, mark 'No' or 'Yes.' If the response has been applied, put a 'No.' If you propose an action, give a sign 'Yes.' (4) Determine some urgent actions, and put a 'Priority' sign for the response. (5) Write suggestions for corrective actions in the 'Description' section. At HGS, there are 11 criteria evaluated using the HGS checklist [12, 18-20]. A portion of the HAS checklist is shown in Table 2.

Have clear and marked transportation routes.

Do you propose action?

- No Yes
- Priority



Information:

Fig. 2. Checklist WISE

Table 2. Checklist of HGS

No	Questions	Result			Explanation
1	Halal Policy	Yes (√)	No (√)	NA (√)	
	1. Has the halal policy been established?				
	2. Has the halal policy been disseminated/disseminated to all stakeholders (top management, halal management team, workers, production facilities, suppliers)				

The HGS evaluation procedure is carried out by interviews and direct observation. In the check column, there are multiple choices such as 'YES,' 'NO,' and 'NA.' NA describe Not Applied by company.

2.1.3 Summarizes the results of nonconformities based on CPPB, WISE, and HGS

The next stage is to summarize all findings of discrepancies obtained from CPPB, WISE, and HGS. Unsuitable results are as material for the improvement of the company.

2.1.4 The selection of improvement priorities with the Delphi method

The choice of improvement priorities is made using the Delphi method. Delphi is a method based on harmonizes the communication process of a group to get solutions [22]. Hsu and Sandford [22] claimed that the Delphi was carried out in 4 rounds. 1) exploration of opinion. We questioned experts regarding the problems. Questions conducted verbally. Experts were asked to answer questions. All information was collected from experts. Round 2) summarizes the opinions of experts and communicate it. We summarized all opinions and communicated to all Company experts. Every company expert finds out other expert opinions. Every expert has the freedom to maintain or change his opinion based on the views of other experts. Round 3) looking for information on the reasons for experts related to the opinions. Revision of opinion stage two gives two possible results opinions such as convergent or divergent. If there are opinions that are different from other opinions, We are looking for information about the reasons for it. Round 4) evaluation. The process is carried out to produce an appropriate opinion.

2.1.5 Proposed improvements

The results of the Delphi method became a reference in the process of improving bread at the Company.

2.2 Data collection and analysis

Data collections were done in the company PT. X. It is an Indonesian company that produces dry bread and wet bread. There are 37 elements examined based on the CPPB checklist. The WISE list consists of 58 items that must be examined. There are 11 criteria for the HGS considered. The respondents were used in the Delphi method are six experts.

3. Results and Discussion

The results of the identification of nonconformities use the CPPB, WISE, and HGS checklist are included in the following sections:

3.1 CPPB Checklist Check in the Company

The evaluation results show six elements that have not met the standard. The six items are divided into 5 Serious categories and 1 Critical category. Serious non-compliance includes a) 2 aspects of building criteria and facilities, b) 1 element of employee health and hygiene criteria, c) 1 element of maintenance criteria and hygiene and sanitation program, d) 1 aspect of process control criteria. Critical Non-compliance is a food label elements. Nonconformity Based on CPPB Standards shown in [Table 3](#).

3.2 Examination of the WISE Checklist

The results of the identification showed nine elements did not meet the standard. Nonconformity Based on WISE Standards be seen in [Table 4](#).

3.3 Inspection Checklist HGS

Based on the results of the identification of the Company's HGS checklist, eight elements have not met the standard. Aspects of non-conformity based on the HGS standard can be seen in [Table 5](#).

Table 3. Nonconformity Based on CPPB Standards

No	Elements Checked	Current Condition	Impact
1	Floors, walls, and ceilings not maintained, dirty, dusty and slimy	Dirty floor, The walls, and ceiling are dusty, and there are spiderwebs	The production room unclean and has the potential to cause pollution to the food produced
2	Ventilation, doors, and windows are not maintained, dirty, and dusty.	The door is not equipped with gauze. There are open vents equipped with gauze, but the vents are dirty and dusty. There is no window in the production room	The production room unclean and has the potential to cause pollution to the food produced.
3	Employees in the food production department do not wear fatigues and wear jewelry.	Employees use fatigues, hats, aprons, use footwear but do not use gloves and masks.	Potential to cause contamination of food produced from the hands of workers
4	Waste in the environment and the production room is not immediately discarded.	Trash cans are covered. However, garbage is disposed of to polling stations when the trash bag is full.	this is lead to contamination of the food produced and cause unpleasant odors in the production floor
5	The industry does not have or does not follow the flow chart of food production	There is no flow chart for setting a standard production procedure. Only regular notes	The industry does not have methods that be used to monitor production carried out.
6	Food label does not list product name, list of ingredients used, net weight/contents, name and address of Industry, expiration date, production code, and registration number of product	The food label does not include the production code. The Company only knows the production code	Consumers cannot see the production date of the product

Explanation :

No. 1 – 5 is a serious category mismatch

No. 6 is a critical category mismatch



Table 4. Nonconformity Based on WISE Standards

No	Element checked	Current Condition	Impact
1	Provides ramps rather than making stairs at work	There are stairs to connect the 1st floor to the 2nd floor. Moreover, there are two steps from the production floor to the packaging place	Workers can fall if they do not pay attention to the steps. Especially when workers are carrying bread containers.
2	Use a train, trolley, or another device that uses wheels when moving materials.	Workers manually transfer bread from the production room (carrying containers using hands). Some workers use both sides to give containers.	Workers feel tired quickly because they have to go back and forth from the production room to the packaging room. especially in the production line, there are stairs from the production room to the packaging
3	Using a protective and permanent barrier to prevent direct contact with moving machine parts	In the bread dough grinder, there are rotating and not closed parts	Potential to endanger the safety of workers while doing dough grinding
4	Check, clean and maintain machines, including electrical cables regularly	The company has technicians to maintain the electrical installations used. However, checks are not carried out regularly	Potentially endangering the safety of workers and can harm Ganep's bread. Because if there is damage to the engine can inhibit the production process.
5	Move heat, noise, dust, and chemical sources from a common work area.	For heat from the oven, it has been moved using a chimney that is directly connected from the oven. However, for the smoke produced from the process of roasting glutinous rice, there is not yet	The smoke produced from the roasting process has the potential to cause contamination of the food produced.
6	Place separate waste containers in the workplace for various types of waste	Disposal of waste or garbage into one place. Trash is not separated by category.	Causes breeding grounds for organisms that can cause disease and cause unpleasant odors in the production room
7	Ensure that installations, equipment, and equipment are maintained regularly and repairs are carried out by competent technicians	Checks are not conducted regularly	Potentially endangering the safety of workers and can harm Ganep's bread. Because if there is damage to the engine can inhibit the production process
8	Ensure safe storage of combustible materials	12 kg of liquid petroleum gas storage is placed in an open room	Potential for fire
9	Establish an OSH policy and provide adequate safety and health training for all workers	At present, the industry does not yet have an OSH policy for workers and the industry has also not provided training on OSH for all workers	Potential to cause an unsafe and uncomfortable work environment and can increase workplace accidents

Table 5. Nonconformity Based on HGS Standards

No	Elemen Checked	Current Condition	Impact
1	Have written procedures for conducting training for all personnel involved in critical activities	Do not have written procedures for implementing training for all workers. The company only conducts counseling to employees if needed.	Company employees, not all understand their responsibilities in the implementation and continuous improvement of the halal guarantee system.
2	Have a written procedure for inspecting incoming goods	Do not have a written system for the inspection of incoming goods. Workers only check the physical condition of the goods received. Moreover, no one has been given the responsibility to inspect the goods coming.	If there is damage to the goods or goods received that are not by the order, workers who inspect goods at that time are confused when having to request replacement goods to the supplier.
3	Has a procedure for the production section	Does not have written procedures for the production section. Roti Ganep only provides information on how production activities are carried out.	There are no proper procedures that can be used as guidelines by workers in carrying out production activities. If an error occurs in the production made, it confuses when it comes to tracing the error.
4	Have written procedures for washing production facilities	Do not have written procedures for washing production facilities. Workers wash the production facilities when it has been used. It uses washing materials that have been provided.	The company cannot guarantee that the cleanliness and safety of the production equipment used is guaranteed to be clean and secure in accordance with existing standards.
5	Have written procedures for storing materials and products including storage in warehouses	Do not have written procedures for storing materials and products.	The company cannot guarantee that the cleanliness and safety of the materials stored are guaranteed to be clean and secure. In addition, it has the potential to confuse workers when they want to find or collect materials from the warehouse. Because there are no procedures that can be used as guidelines
6	Have written procedures to guarantee the traceability of certified products	Do not have written procedures regarding the traceability of certified products derived from materials that meet the criteria	The company cannot ensure that every material used has met the requirements.
7	Have written procedures for conducting internal audits	Do not have written procedures regarding the implementation of internal audits.	The company does not conduct periodic internal audits.
8	Save evidence of the implementation of management reviews	Does not maintain evidence of the application of management reviews that have been carried out	Does not have official evidence if the Company has conducted a management review of the effectiveness of the implementation of HGS and improvements that must be made in the future.

3.5 Implementation and Results of the Delphi Method

The Delphi method is used to find priority improvements based on the results of CPPB, WISE, and HGS mismatches that have been done. The Delphi method process is carried out in 4 rounds.

In Round 1, we give open questions about the implementation of CPPB, WISE, and HGS in the Company. The results of the respondents' answers regarding the application of CPPB, WISE, and HGS in the Company have been well implemented. However, deficiencies must be corrected at the Company. Improvements fixed by the respondent are administrative improvements. The admin improvement is the creation of a Standard Operating Procedure (SOP). In addition, from the results of examinations using the HAS checklist, many SOP documents have not been approved by the Company.

In Round 2, We described the SOP that the Company had not owned. It is being adapted with the Company's HGS non-conformity. Based on the search results, the proposed improvements lead to administrative improvements such as the fulfillment of SOPs that have not been met. Furthermore, the Company needs to shorten SOP documents that it does not yet have. SOPs that are not yet owned are SOPs for washing production facilities, SOPs for checking and receiving raw materials, SOPs for halal production, SOPs for traceability, and internal audit SOPs. After the description was carried out, respondents were allowed to provide opinions on each SOP that the Company did not yet have.

Round 3 selects SOPs from 5 SOPs that have not been received by the Company. At this stage, each respondent gives an opinion about the SOP made. Respondent A agreed to make SOPs for receiving and receiving materials. Responding B approved the making of halal production SOPs and facility washing SOPs. Respondent C agreed to the making of facilities washing SOPs and SOPs for receiving and receiving materials. Respond D approves SOP for inspection and receipt of materials. The SOP is divided into two, namely checking and receiving industrial processed raw materials and industrial non-processed materials.

Round 4 is to choose an SOP that is a priority for improvement. Based on the previous stage, there were 3 SOP proposals. The SOP includes washing up production facilities, checking and receiving raw materials for industrial and non-processed industrial processes, and a halal production. The three proposed SOPs was chosen as a priority for improvement. Based on the results of the question and answer, the Company needs to make an SOP for the inspection and receipt of raw materials for industrial and non-processed industrial products. The SOP for check and receipt of raw materials is closely related to the technical reference of the production system. This time, The company does not yet have an official SOP regarding inspection and receipt of materials from suppliers.

3.6 Proposed improvements

Proposed improvements for the Company are SOPs for the inspection and receipt of industrial and non-processed industrial materials. In preparing the SOP, three stages must be done. Three steps in compiling SOPs according to [Ekotama \[23\]](#), there are : (1) Determine the type of work and workflow, (2) Describe in the form of work charts, and (3) Write in the form of descriptions. The proposed SOP for inspection and receipt of industrially processed materials can be seen in [Table 6](#). The proposed SOP for check and receipt of industrial non-processed materials can be seen in [Table 7](#).

Table 6. SOP Examination and Acceptance of Industrial Processed Materials

Company Logo	Document No	: 001
Company	Date	: 26 September 2018
Standard Operating Procedure for Inspection and Acceptance of Industrial Processed Raw Materials	Revision	: 1
	Revision Date	: 10 September 2018
	Page	: 1 from 2

1. Purpose

To determine the suitability of materials received by the Company from suppliers in accordance with the standards set by the Company

2. Tools and Materials

- a. Purchase Order
- b. Records of raw material purchases

3. Related Parties

- a. The person in charge of inspection of raw materials
- b. The person in charge of the warehouse
- c. Workers

4. Procedure

- a. The person in charge of raw material inspection checks the purchase order.
- b. The person in charge of inspection of raw materials checks the name of the material, the condition of the packaging, the MUI Halal logo, the expiration date, the quality, and the quantity of the product. If the raw material received is not suitable, then immediately contact the supplier to return the raw material.
- c. Workers move the appropriate material to the warehouse based on wet and dry material.
- d. The person in charge of the warehouse ensures that the material is stored in the warehouse safely, well and cleanly
- e. The person in charge records incoming items and materials out on the stock card

Table 7. SOP for Inspection and Receipt of Non-Processed Industrial Materials

Company Logo	Document No	: 002
Company	Date	: 26 September 2018
Standard Operating Procedure for Inspecting and Receiving Industrial Non- Processed Raw Materials	Revision	: 1
	Revision Date	: 10 September 2018
	Page	: 2 from 2

1. Purpose

To determine the suitability of Non-Processed Industrial Materials received by the Company from suppliers by the standards set by the Company

2. Tools and Materials

- a. Purchase Order Non-Processed Industrial Materials
- b. Records of Non-Processed Industrial Materials purchases

3. Related Parties

- a. The person in charge of inspection of Non-Processed Industrial Materials
- b. The person in charge of the warehouse
- c. Workers

4. Procedure

- a. The person in charge of Non-Processed Industrial Materials inspection checks the purchase order.
- b. The person in charge of inspection of Non-Processed Industrial Materials checks the name of the material, the condition of the packaging, the MUI Halal logo, the expiration date, the quality, and the quantity of the product. If the raw material received is not suitable, then immediately contact the supplier to return the raw material.
- c. Workers move the appropriate material to the warehouse based on wet and dry material.
- d. The person in charge of the warehouse ensures that the material is stored in the warehouse safely, well and cleanly
- e. The person in charge records incoming items and materials out on the stock card

4. Conclusion

The results of the identification using the CPPB, WISE and HGS checklists found some discrepancies. Based on the CPPB checklist found six elements that have not been fulfilled. Based on the WISE list, nine elements have not been met. Based on HGS, eight elements have not been met. Proposed improvements are made by making SOPs for inspection and receipt of materials. SOP for control and receipt of materials for industrial and non-processed industrial processes. For the next research is to make a new measuring instrument to assess food safety standards (CPPB), WISE, and HGS at the same time. The three checklists (CPPB, WISE, and HGS) have several standard criteria.

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