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Halal Critical Point of Beneng Taro Products Identification Produced by Micro Enterprise in Serang City, Banten

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ABSTRACT

Food products that have a halal certificate must fulfill halal standards. The halal assurance system is created and implemented in order to ensure the halal production process. The concept of Halal Assurance System (HAS) 23000 is used as a reference to implement halal product processing. The problem is that there are many ingredients, the main raw materials and additional ingredients—that are not clear about their origin and halal assurance. This study aims to identify the Halal Critical Point (HCP) of derivative of beneng taro produced by microenterprises. This study uses a qualitative method. Sources of research data were taken from observations and interviews with owners of businesses, as well as observations at the research location. Halal critical materials are beneng taro flour, cassava flour, vegetable oil, and dry coriander. Halal critical processes are production, washing facilities, and transportation. The critical control points in production include soaking, washing, and frying.

Keywords: Halal Critical Point, Beneng Taro, Crackers, Chips

INTRODUCTION

Indonesia as a country with the largest Muslim population in the world, apart from in addition, Indonesia is also a very potential Muslim consumer market. The government has a great responsibility to protect the public overall, especially consumers for the halal of the products in circulation and marketed. The words "halal" and "haram" are terms of the Qur'an and this used in various places with different concepts, and some related to food and drink. The basis used for shows the necessity of consuming food and drink, plants and animals/animals that have been lawful and thayyib (good) are listed in the Qur'an and Hadith (Ali 2016). In today's food industry, foodstuffs are processed through various new processing techniques and methods by utilizing the development of science and technology, so that it becomes a product that ready to be thrown for consumption by people around the world.

According to (Faidah 2017) one form of protection and guarantee is to consumers that the products consumed have been researched and declared. Halal, namely having a halal certification so that it gives a sense of calm and comfort peace of mind for consumers. In terms of producers according to (Atma et al. 2018) halal products make products have prestige and trust from consumers so that it becomes one

of the product requirements in order to penetrate the global market, either local and international arena.

The combination of HACCP and Halal ensures that the food product and food contact products are safe and halal. Determination of Halal Critical Point can be done by referring to Hazard Analytical Critical Control Point steps. According to Riaz and Chaudry (2019), the Halal principle refers to HACCP system. Halal-HACCP principles consist of 7 principles, namely 1). Identification and analysis of all potential haram materials. Haram materials are various materials that are prohibited in Islamic for consumption. Haram substance analysis was carried out prior to hazard analysis. 2). Determination of HCP and CCP. HCP is determined before CCP decision tree. 3). Determination of critical and forbidden limits. The critical limit for hazard is measured with the presence or absence of illicit substances. 4). Determination of control measures. 5). Determination of corrective. 6). Determination of validation and verification procedures. Validation and verification can carry out by checking the material halal certificate and testing production processes and products.

In accordance with mandatory of process product halal and every food product must meet halal certification, so study of HCP and HCCP product need to be done in the small and micro enterprise. CCPs need to be quantifiable to achieve measurable limits and monitoring. It is a challenging task to identify CCPs for products especially those products which fall into minimal processed category (Kohilavani et al. 2013). The objectives of this research are to identify HCP and HCCP product derivatives of Talas Beneng include chips and crackers. This product is produced by some micro enterprises in Serang City, Banten Province.

MATERIALS AND METHODS

HCCP can be defined as a point, stage or procedure in halal food production so that cross-contamination of illicit materials can be prevented or removed (BSN 2016). Identification of the critical point of product halalness can be done by using a tree.

The CCPs are generally identified by using codex CCP decision tree. A Decision Tree is a predictive assessment, by mapping from observations about an item (Process or Materials) to infer conclusions about its status. This also known as "Classification Tree" or "Reduction Tree", the technique is used primarily as a decision support tool that uses a tree-like graph or model of decisions and its possible consequences, including chance event outcomes, resource costs, and utilities. Process step CCP decision tree by Horchner et al. (2006) were adopt in this study. Determination of the CCP based on CCP decision tree followed this question:

1. Do control measure(s) exist?
2. Is the step specifically designed to eliminate or reduce the likely occurrence of a hazard to an acceptable level?
3. Could contamination with identified hazards(s) occur in excess of acceptable level(s) or could these increases to acceptable levels?
4. Will a subsequent step eliminate identified hazards or reduce likely occurrence to acceptable levels?

Meanwhile, HCCPs are able to identify by using the HCCP decision tree for the ingredients and process control. Halal Critical Control Point (HCCP) decisions and some questions (Kohilavani et al. 2013):

1. Do all raw materials have halal certification?
2. Is there any possibility for cross contamination of haram substance?
3. Are the noncertified products are being used in the process?
4. Does the material contain any haram substances?
5. Is the specific production line and storage area for certified and non-

certified process and ingredients clearly identified?
6. Could the sanitation procedure able to eliminate the fat, smell, color and taste (dibagh)?
7. Is there any potential cross contamination of haram substances?

RESULTS AND DISCUSSION

General Description

The product description contains information about the product. Beneng taro chip and beneng taro cracker is produced by some of micro enterprises in Serang City, Banten Province. These products were produced as a form of diversification activity from Banten's local food materials. These products were produces by many micro or small enterprises in Banten Province, but this research only analyze one enterprise that located in Serang City, Banten Province. This micro enterprise was managed by Kelompok Wanita Tani (woman farmers group) of Tanjung Kulon, Talaga Warna, Pabuaran, Serang City, Banten Province. In 2022, this enterprise produces 2 types of food product namely chips beneng taro and cracker beneng taro. The chemical composition of product can be seen in the Table 1.

Crackers are a type of dry food made from high levels of beneng taro starch meanwhile chips are a kind of snack in the form of thin slices of tubers that are fried in vegetable oil. The packaging of these products are plastics and netto 100 grams.

Processing of Products

Chips Beneng Taro

Taro chips was processed by stripping raw materials and followed by washing and soaking in the citric acid solution/salt solution for 24 hours. The process continued with drain the material using a traditional machine and continued by draining and frying. The chips then added with flavoring and seasoning materials.

Peel the skin of the taro beneng and then wash it with water until clean, thinly slice the taro beneng with a sharp knife or use a cutting tool. Taro beneng that has been cut into thin is then soaked in 10% salt solution/acidic acid for 24 hours to remove the oxalate content. The taro that has been soaked is then washed thoroughly until the rinse water is clear. The rinsed taro is then drained and fried until cooked and crispy.

Cracker beneng taro

Cracker beneng taro was processed by through several stages, including: cleaning the skin, cutting the taro into thin strips, soaking in salt solution for 24 hours, rinsing, draining, mixing flour, kneading, mixing dough and beneng taro, printing, steaming, drying, and frying.

Peel the skin of the taro beneng and then wash until clean, thinly slice the taro beneng with a sharp knife or use a cutting tools so that the result is same. Taro that has been cut is then soaked in 10% salt solution for 24 hours to remove the oxalate content. The taro that has been soaked is then washed thoroughly until the rinse water is clear. The rinsed taro is then drained and crushed. The cracker dough is made by grinding the spices and mixing them with tapioca flour, fine taro beneng and water, then the dough is shaped until smooth. The cracker dough is laid out in a container and steamed until cooked. The cooked dough is then dried in the sun to dry and fried.

Critical Point on Raw Materials

Critical activities effect on halal status of a product. Critical activities may include selection of new materials, purchase of materials, inspection of incoming materials, product formulation, production, washing of production facilities and auxiliary equipment, storage and handling of materials and products, transportation, display, visitor management, menu determination, slaughtering, customizing with the company's business processes (manufacturing industry, RPH, restaurant/catering/kitchen) (LPPOM MUI 2008).

In the material selection, all materials are categoriz into 3 types namely vegetable, animal and microbial materials. The material selection procedure must guarantee that every ingredient used is approved by the Halal Certification Body.

HCP identification of each ingredient is based on a decision tree. The halal decision tree is used as a reference to replace unclear halal material with clearly halal materials. According to material categories, beneng taro's crackers and chips mainly use vegetable materials so determination of HCP materials only based on decision tree of vegetable materials. Other material such as water and organic material categorized based on positive list halal materials (LPPOM MUI 2013; Kemenag 2021).

Mapping Decision Tree of Vegetable materials

Vegetable materials are obtained from plants. Decision trees from vegetable materials can be seen in Figure 1.

The identification of the halal status of vegetable material is based on the decision tree in figure 1. The HCP of all materials to produce chips and crackers of beneng taro must be identified through the decision tree. The identification of halal status of cracker and chips materials is shown in Table 2.

Flour can be added as a coating material. Coating materials other than halal materials such as gum are also from syubhat (dubious) materials such as gelatin. L-Cysteine is an improving agent to improve the properties, and quality of the flour (Apriyantono, 2007). L-cysteine could be made from human hair and animal hair. If L-cystein is made from human hair, it is including non halal material. L-Cysteine from animal hair must be ascertained from halal animals (Sucipto et al. 2022).

Coriander is harvested from plant. But Coriander used in the chips and cracker was dry coriander. Although, it does not contain additives material, coriander meet physical drying process. Drying facilities should meet the Islamic law that is free from haram substances contamination.

Cooking oil is from vegetable oil or animal oil, which in the processing involves pale material in the form of bleaching earth or activated charcoal and the addition of antioxidants. It makes halal certified should be required in oil production process (HAS 23201: Persyaratan Bahan Pangan Halal, 2012). This business use packaged oils that have halal labels. However, there are still some moments, which still use uncertain bulk oil from market. According to Sugito et al. (2018), some producers mix vegetable cooking oil with animal oil to produce more savory food taste. Mohammed et al. (2012) state that produces adsorbents in palm oil can use pig bones. The enterprise should be aware of this issue and change vegetable oil material with packed oil.

Mapping Decision Tree of other materials

Salt, acetic acid and water are additive materials in making chips adnd crackers products. Decision tree of salt, water, acetic acid can be determined based on the Figure 2.

Based on Figure 2, halal status of materials can be categorized. Table 3 show materials category from product.

Salt is a mineral that is categorized as uncritical because it has not undergone any processing. Salt includes in mineral that has no HCP. Water is also materials uncritical or positive list. Acetic acid and packaging material (plastics/ polyethylene) categorize as synthetics that is positive list.

Purchasing Materials

In the manual halal self-declare, purchasing activities must have supporting data such as the name of the materials, brand, company name and halal certification materials, date purchasing, and total purchasing. According to HAS 23000, purchasing data include the name of the material, code, company name, factory location, and halal logo. Suppose there is a

material that has not been certified as halal. In that case, it must be replaced with halal-certified material or have a halal production process statement from the producer that needs to be verified by the halal inspector (Sucipto et al. 2022). But, in the case of self-declare certification, it is recommended that the materials used must have a halal certificate.

Inspection of Incoming Materials.

In the case of micro enterprise, materials were purchased based on customer order. The owner buys some materials by themselves. Suppose purchasing was carry out in lot number, inspection was done when materials come in owner house production. The inspection included physical condition (freshness, colour, odor), brand named, expired date, and amount. Administration record was carried out after inspection with listed information of purchasing date, amount, type product, and brand.

Critical Point on Process

Production

Production is carried out at facilities that meet the criteria, halal, and free from haram substances and najis (ritually unclean) materials. This requirement applies to self-owned production facilities and other parties' facilities if subcontracting production (Sucipto et al. 2022). Production in this micro enterprise is carried out after receiving a customer order. Production activities are in kitchen. Production was done in the house. Before carrying out production, employees must wear closed clothing and gloves when processing materials. This must be done because hygiene and sanitation are also prerequisites in the halal production process program

Production of chips are peeling, washing, cutting, soaking, draining and frying. Production of cracker are peeling skin, cutting, soaking rinsing, draining, mixing, kneading, mixing dough, printing, steaming, drying, and frying. Halal critical point of product lays on selection materials. To prevent haram substances and Najis (ritually unclean) materials contamination, all facilities must be cleaned before it is used. This is possible for micro entrepreneurs.

Washing of Production Facilities and Equipment.

Washing facilities in this enterprise are carried out before and after production using flowing water. A washing uses liquid dishwashing soap for all types of tools. The pans, container, and knife are cleaned before using every production. The dishwashing soap has a halal certificate so that it can guarantee product halalness. Washing using flowing water is better than soaking (Azari in Sucipto et al. 2022). Washing using running water removes all dissolved impurities without recontamination of the equipment (Sucipto et al. 2022. *Storage and Handling of Materials and Products*

There is no product storage in this industry. Products that have been produced are packed in plastic packaging/pouches and delivered directly to the consumers. Materials that come directly processed into products. For packaged materials, materials are stored in a closed condition.

Transportation

Transport procedures must be observed to ensure halal products' contamination by haram (unlawful) or najis (unclean Islamic ritually) materials during transportation (LPPOM MUI 2013). Transporting materials from suppliers must be clean from haram or najis substances and not transport haram material, animals, or humans. The halal supply chain in production is essential to halal product assurance (Tieman, 2011). In the case of micro enterprise, packing was done manually by employees. Transportation used motorcycle to the customer by owner/employee.

Halal Critical Control Point

CCPs are the control points at which food safety hazards can be eliminated, prevented and reduced to safety level (Kohilavani et al. 2013). Similarly, HCCPs are the steps where haram substances are identified and eliminated from the process steps. Determining the CCPs and HCCPs of both products was shown in Table 4 and Table 5. HCCPs are able to identify by using the HCCP decision tree.

CONCLUSION

Based on the analysis, it known that chips and crackers of has halal critical point in the selection materials. Halal critical materials are beneng flour, cassava flour, vegetable oil, and dry corriander. Halal critical process are production, washing and transportation. The critical point in the production includes soaking, washing, frying. Beneng taro chips and crackers don't have halal critical control point, but its only critical point.

SUGGESTIONS

Suggestion for further research are implementation of processing of halal product and quality control in the process.

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Table 1. Chemical composition of product

Chemical composition (%)	Chip beneng taro	Cracker beneng taro
Moisture content	7.10	2.58
Ash content	3.40	3.36
Fat content	24.77	32.29
Protein content	3.45	1.61
Carbohydrate	61.28	60.16

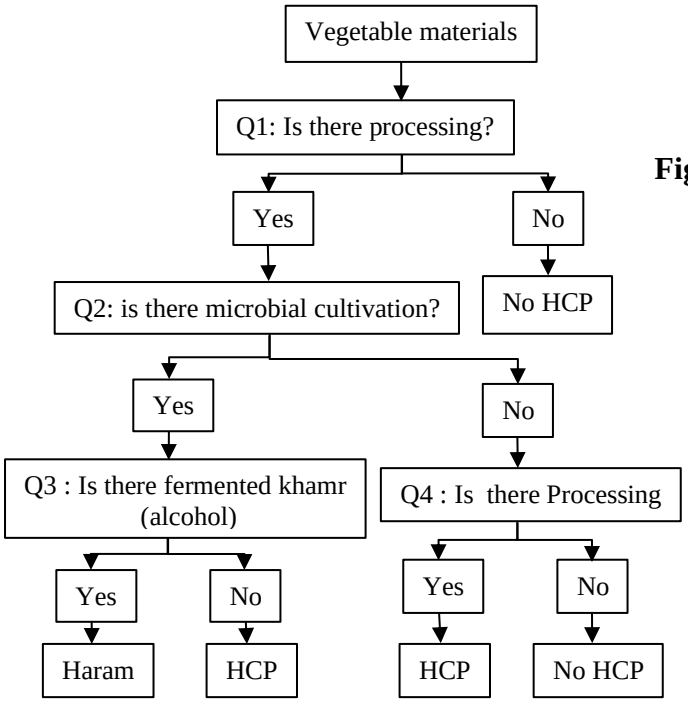

Figure 1. Decision tree for identification of Halal Control Points for vegetable materials (LPPOM, 2013)

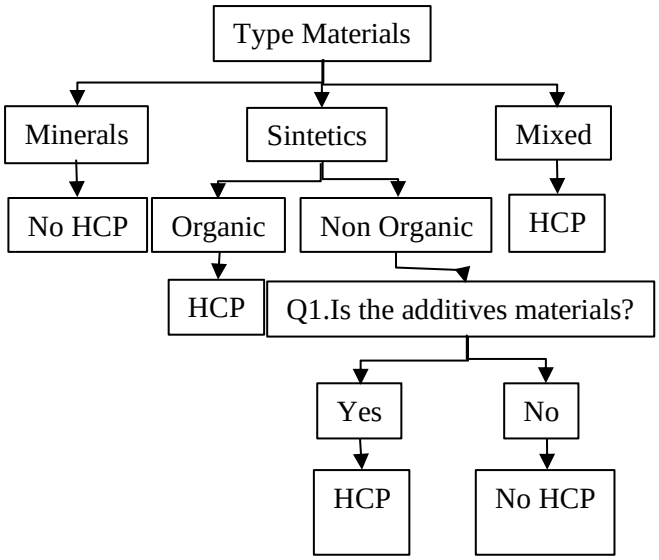

Figure 2. Decision tree for identification of Halal Control Points for other materials

Table 2. Materials identification based on mapping decision tree

Product	Materials	Question				Status HCP	Potential risk
		Q1	Q2	Q3	Q4		
Chips	Beneng Taro	No	-	-	-	No HCP	-
	Vegetable oil	Yes	No	-	Yes	HCP 1	Additives materials, process contamination bleaching agent
Cracker	Onion	No	-	-	-	No HCP	-
	Coriander	Yes	No	-	Yes	HCP 2	Additives materials, process contamination
	Vegetable oil	Yes	No	-	Yes	HCP 3	Additives materials, process contamination bleaching agent.
	Beneng flour	Yes	No	-	Yes	HCP 4	Additives materials, process contamination
	Cassava flour	Yes	No	-	Yes	HCP5	Additives materials, process contamination

Table 3. Materials category for product

Product	Materials	Positive list[a,b]	Category	Status HCP
Chips	Water	Yes	-	No HCP
	Salt	Yes	Minerals	No HCP
	Acetic Acid	Yes	Synthetics	No HCP
	Packaging materials (plastics)	Yes	Synthetics	No HCP
Crackers	Water	Yes	-	No HCP
	Salt	Yes	Minerals	No HCP
	Packaging materials (plastics)	Yes	Synthetics	No HCP

Sources: [a]LPPOM MUI (2013)
[b]Kemenag (2021)

Table 4. Determination CCP

Product	Question				CCP/ CP
	Q1	Q2	Q3	Q4	
Taro beneng Cracker	No	Yes	No	Yes	Soaking Washing Frying
Taro beneng chips	No	Yes	No	Yes	Soaking Washing Frying

Sources: direct observation in small enterprise

Table 5. Determination HCCP

Product	Questions							Status HCCP /HCP
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	
Taro beneng Cracker	No	-	No	No	No	Yes	No	HCP
Taro beneng chips	No	-	No	No	No	Yes	No	HCP

Sources: direct observation in small enterprise