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# Reconstruction of Community Knowledge in the Process of Making Potato Dodol Kerinci on the Criteria of Product Halalness Using Ethnoscience Approach

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**abstract**

This study aims to reconstruct the community's original knowledge in the process of making potato dodol into scientific knowledge according to the halal criteria of a product determined by the halal product guarantee system. The research method used is descriptive qualitative based on ethnoscience with the scope of examination including document analysis, interviews and documentation. Data collection is done directly to respondents (business actors) by purposive sampling. The data obtained were analyzed according to the criteria for the halal product assurance system which includes: commitment and responsibility, materials, halal product processes, products and monitoring and evaluation. Data analysis is carried out with traceability according to the halal document of a product. The results showed that the process of making potato dodol according to community knowledge can be transformed into scientific knowledge was acquired and developed from generation to generation. The stage of start from preparing ingredients, boiling, milling, mixing the dought with other ingredients, kneading, printing and cutting, drying, packaging and labeling. It can be concluded that the procedure for making potato dodol developed through generations is comply with Islamic law, star from use of tools, production facilities, packaging systems, storage, distribution that are free of non-halal materials which meet standards and can be consumed by the public.



## 1. Introduction

The Kerinci Regency is famous for its beautiful nature, and it is surrounded by hills and mountains. The region also has fertile land, making it perfect for growing a wide variety of plants. One of the species used is potato (*Solanum tuberosum* L), which is known as "Kubic" in the local language. After rice, wheat, and maize, *Solanum tuberosum* L is the most popular vegetable consumed as a traditional diet in other countries (Dereje & Chibuzo, 2021; Yildiz & Ozgen, 2021;). Potatoes (*Solanum tuberosum* L.) are the fourth most important crop in the world. A, B complex, C, and folic acid are just a few of the vitamins found in potatoes, which are also high in minerals, protein, and carbohydrates. In the nations where they are grown and eaten, potatoes are one of the most significant sources of vitamin C (Guchi, 2015; Hidayah et al., 2017). In

furthermore, potatoes have a low-fat level, high quality protein, dietary fiber, polyphenols, vitamins, and minerals (Liang et al., 2019). So many past studies that evaluated the nutritional qualities of potato cultivars grown in various regions found that there were noticeably different nutrients in each cultivar, which may have been influenced by the soil, climate, and cultivation methods (Motalebifard et al., 2013; Ngobese et al., 2017).

The people of Lubuk Nagodang village, Siulak district, Kerinci regency have utilized various agricultural products as raw materials for home industries, including potatoes which are processed into potato dodol (Apdelmi, 2018). Although potato dodol is not a typical Kerinci food, it became one in the late 1990s as a result of local government empowerment efforts made possible by the potato dodol industry. The knowledge possessed by the surrounding community in processing potatoes is to be a productive process as one of the foods consumed in everyday life.

Based on field observations, it is known that they studied the materials to be used, such as potatoes, wheat flour, sugar, salt, and dyes used in producing the potato dodol, before doing the processing in order to make it. By using methods and scientific knowledge in accordance with the halal standard of a product before consumption, the process of making potato dodol through several stages has been evolved from the original knowledge of the people of Lubuk Nagodang, Kerinci Regency. One of the snack foods that has become an icon for its people is in popular among everyone, from children to adults, because to its unique, savory, and sweet flavor. (Syafutri & Lidiasari, 2014).

The materials for potato dodol, which is made from potatoes *Granola* sp, coconut, sugar, and white glutinous flour, are smashed together, boiled until cooked, chilled the stew, and then the potatoes are ground until smooth. Food coloring or flavors (avocado, pandan, strawberry, pineapple, palm sugar, and durian) and salt are then added before printing, cutting, and wrapping the finished product using secure and long-lasting oil paper. This procedure has so far only been passed down from one generation to the next among the Kerinci people, who like this food. This process will be discussed in detail in the view of ethnoscience. In this study, it is expected to get new scientific treasures related to the halalness production of regional specialties that are reconstructed into ethnoscience studies so that later they can be used in consume by public. Ethnoscience helps unite local science with formal science in a more balanced process and the study of culturally based knowledge systems and cosmic events that are part of society (Azizah & Premono, 2021; Fitria & Wisudawati, 2018).

Along with the development of community knowledge and expertise in processing potatoes, a food product labeled potato dodol was born. The process and procedure for making potato dodol so that it is suitable for consumption by the wider community is certainly the main goal, especially the halal label that must be on the potato dodol product. The halalness of a product before consumption becomes a very important part, especially for Muslims before the consumption process is carried out. This has also been emphasized in QS. Al-Baqarah: 168 which means, that Allah SWT dictates for us to eat food that is lawful and good from what is on earth. Furthermore, QS Al-Baqarah: 173 explains: that the food that is forbidden to eat is carrion, blood, pigs and animals slaughtered without mentioning the name of Allah SWT (Surah Al-Baqarah: 168). This is certainly a very important concern for Muslims before buying and consuming by ensuring that there is a halal label on the product. The importance of foresight and concern for a product so that it is feasible to be marketed and consumed by the wider community. For consumers, of course, they have a commitment to their religion, this is shown by the consequences in consuming products that should be in accordance with sharia (Suhartanto et al., 2018 & 2019). The three principles of halal logistics, according to Tieman (2013), are: direct

contact with haram items; risk of contamination; and consumer perceptions among Muslims. The production of halal items must agree to these three criteria in order to be transparent.

Product categories that are consumed by the muslim community in general before being purchased and used whether halal or haram are very important (Abdul-Talib & Abd-Razak, 2013). This is indicated by the lack of information received by consumers about legality/halal certification or halal labels embedded in some products to be consumed (Rajagopal et al., 2011). Limited information that affects the behavior and actions of consumers in making choices. The importance of a positive attitude and consequences in determining the product to be consumed is an important part in building the concept and awareness of halal. Several previous researchers found that the decision to choose halal products is determined by a positive attitude (Ambali & Bakar, 2014; Awan et al., 2015; Said et al., 2014).

Scientific knowledge from community culture that has been passed down from generation to generation in making potato dodol is an ethno-science approach to learning. The study of ethnoscience is very important to do because it gives rise to the characteristics of an area that should be preserved considering that Indonesia consists of various ethnic groups and various cultures (Sudarmin, 2014). The approach through the reconstruction of local knowledge of the community becomes a strategy in growing an ethnic learning environment that integrates training planning with community culture. One form of training through ethnoscience requires the ability to combine original knowledge with scientific knowledge. The main goal is to prioritize a system that is characterized by the unique knowledge of society (Parmin & Febriana, 2019).

Several studies have been conducted to explore the culture of society related to science and its changes. Studies show that many cultural practices in society are chemically related, both in the fields of food, crafts, and medicine. Culture is related to a distinctive tradition or cultural heritage of an area in various forms such as language, religion, and several activities that support the social life of the indigenous people of an area. Culture consists of elements of a sign (sig) symbol (symbol) and meaning (meaning). Symbols and meanings are things that people have in common and lie between them and are public. Each culture or ethnicity has these three unique elements and the culture of each region also has characteristics that distinguish it from the others. The term "learning with an ethnoscience approach" refers to science education that emphasizes national identity, local cultural traits, and customs. According to Sudarmin et al. (2018), studying ethnoscience is crucial because Indonesia is home to a variety of ethnic groups and traditions that need to be conserved.

Unbeknownst to the public, the process of making potato dodol actually involves an ethnoscience process in the workflow. The ethnoscience process is an attempt to reconstruct indigenous knowledge into scientific reconstructed knowledge (scientific knowledge). The knowledge possessed by a nation or more precisely a certain ethnic group or social group/society is often referred to as community science knowledge or Indigenous Science (Sudarmin, 2014). Several terms used reveal that ethnoscience is an activity to transform original science (knowledge that develops in society) into scientific science (Rahayu and Sudarmin, 2015). In addition to Sumarni (2018), the manufacture of coconut sugar can be used as a science learning resource because traditional knowledge from the community was transformed into scientific knowledge.

The purpose of this study is to identify and explain how community knowledge was transformed into scientific knowledge in the production of potato dodol using an ethnoscientific approach and product halal standards. This will enable the public to consume potato dodol made from halal materials. The focus of this research is to construct a problem that investigates how to transform common knowledge into scientific knowledge while applying halal product assurance

requirements to make potato dodol and the relationship between the manufacturing phase and fundamental community knowledge (SJPH).

## 2. Method

The research method used is descriptive qualitative using an ethnoscience approach. The stages of the research include observation, interviews and documentation. Qualitative research in terms of other definitions stated that it is a research that utilizes open interviews to examine and understand the attitudes, views, feelings and behaviors of individuals or groups of people (Moleong, 2018). The observation stage was focused on examining documents based on the reconstruction of public knowledge in making potato dodol. Meanwhile, the interview and documentation stages were focused on extracting primary data and secondary data based on the criteria for the halalness of a product. Qualitative research designs require development while the research itself is in progress. It is open to change, and therefore must be flexible to follow the demands of the development of problems in the field (Hardani et al., 2020).

Data collection was carried out directly to respondents (business actors) with purposive sampling technique. The data obtained were analyzed using an interactive analytical model in three stages, starting with an initial analysis before going to the field, an analysis of the implementation of research in the field and an analysis after the data was collected (Hardani, 2020). Furthermore, it is adjusted to the criteria for the halal product guarantee system which includes: commitment and responsibility, materials, halal product processes, products and monitoring and evaluation through traceability according to the halal document of a product. The flow of making the Kerinci potato dodol includes: (1) Material preparation (potato); (2) boiling; (3) milling; (4) mixing the dough with other ingredients such as coconut, sugar, salt and flavors or food coloring; (5) kneading; (6) potato dodol printing and cutting ; (7) drying and (8) packaging and labeling. To ensure the level of confidence in the data, intensive observation, data triangulation, and methods as well as preparing references based on traceability were carried out. Qualitative analysis was carried out by describing the reconstruction of public knowledge about making potato dodol in everyday life and people's lives (Parmin, 2019).

## 3. Result and Discussion

Based on the results of document analysis, interviews and documentation with business actors, information was obtained that the potato dodol production process was carried out traditionally and passed down from generation to generation.

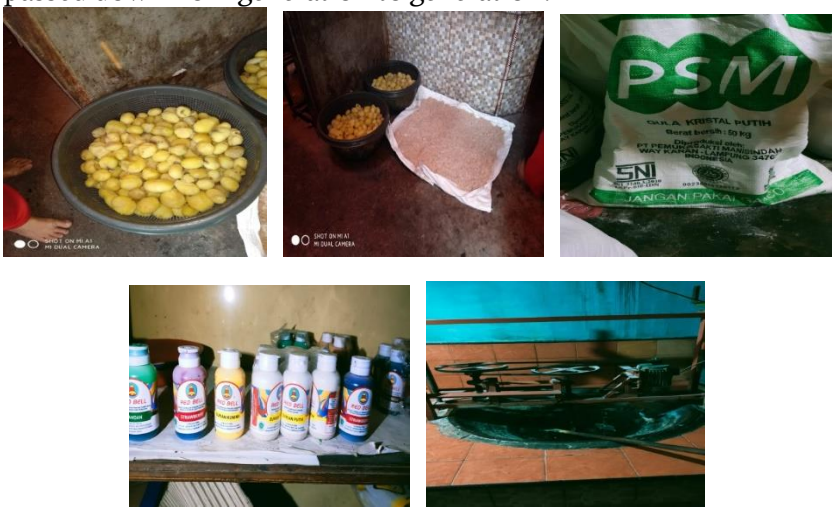


**Figure 1**. Materials and tools are used to make potato dodol

From the Figure 1, it can be seen, the materials for the process of making potato dodol start with potatoes being prepared as the main source of components, and then coconut, sugar, and food coloring are added. Meanwhile, a traditional tools created by the business actor is used to cook potato dodol, and firewood is used as fuel. The most crucial step before processing potatoes into potato dodol is to make sure the materials and tools are clean and free of dirt.


**Figure 2**. Typical of potato dodol

In making potato dodol, flavors including avocado, pandan, strawberry, pineapple, palm sugar, and durian are added as food coloring, as shown in Figure 2. Community knowledge in making potato dodol Kerinci is knowledge acquired from generation to generation from a developed family business. A series of processes that have been passed have received official legality from the government which is marked by the registration number of the micro small and medium enterprises potato dodol Lubuk Nagodang, Siulak district, Kerinci regency HK.03.1.23.04.12.2205 with the trademark of family potato dodol with business owner Mrs. Delvina (D). Based on the results of interviews conducted with business actors (D), it is known that at the beginning of making potato dodol, training was organized by the local government whose initial goal was to utilize natural resources and promote community small businesses in supporting the family economy. The last procedure in the process of making potato dodol is the process of packaging and labeling. The dried potato dodol is wrapped in mica paper and then labeled. The stages and processes in making potato dodol can describe and integrate the identification process in plants. This shows that the process of making potato dodol must be in accordance with the stages and the process of identifying living things. This process integrates the ethnoscience process. The scientific concepts at the stages of the dodol-making process which include these eight stages include morphological concepts and procedures for identification and classification of living things. This typical method of producing potato dodol can be used as a teaching tool because it turns out to incorporate several scientific concepts.

**Table 1**. Reconstruction of community knowledge into scientific knowledge results

| No | Question | Community Knowledge | Scientific Knowledge |
|---|---|---|---|
| 1 | What exactly does the word "potato" mean? | The locals said "Kubik" for potatoes, a sort of vegetable frequently eaten with rice | Plants of the Solanaceae family named potatoes (*Solanum tuberosum L.*) produce edible stem tubers known as "potatoes." Science concept: Different plant species |
| 2 | What are the uses of potatoes in daily life? | Potatoes are utilized as vegetables, food additives, and appetite stimulants | Use of potatoes as a snack and main dish in place of rice, especially for diabetics, due to their 20% carbohydrate content when mixed with veggies. Science concept: Nutritional value of potatoes |

| No | Question | Community Knowledge | Scientific Knowledge |
|---|---|---|---|
| 3 | Which varieties of potatoes are used to make potato dodol? | *Granola* | The Granola Potato is one of the potatoes used in the Kerinci district to make dodol kentang due of its soft texture, yellow-white bulb color, and up to 20% carbohydrate content. because it is easy to grow and has a soft texture.<br>Science concept:<br>Potatoes' morphology and classification, plants that locals can use |
| 4 | What materials are used to make potato dodol? | Potatoes, coconut, sugar, white glutinous flour, and salt. | Composition of the materials to identify the texture of potatoes using traditional or conventional procedures to traceability in agreement with the legality of the materials for use in keeping with the LPPOM MUI regulations.<br>Science concept:<br>Composition, halalness materials. |
| 5 | What tools are required to create potato dodol? | A potato grinder, iron pots, fried spoons, firewood, mold-making supplies, basins, cutting boards, and drying racks. | During creating potato dodol, the tools used were adapted to the task at hand and remained conventional.<br>Science concept:<br>Conventional tools |
| 6 | What steps are involved in making potato dodol? | To make potato dodol, follow these steps: (1) clean, peeled, and wash the potatoes; (2) boil until cooked; (3) chill the stew; and (4) grind the potatoes until smooth. (4) adding ingredients to the dough, such as coconut, sugar, white glutinous rice flour, salt, and food coloring (avocado, pandan, strawberry, pineapple, palm sugar, and durian). The thickened dough is taken out of the furnace, pressed into the mold, flattened, and allowed to cool before printing and cutting to the right size; (5) cutting and printing done after potato dodol is chilled; (6) the dodol potato pieces are dried in a drying rack drying using sunlight; (7) packaging potato | The procedure of preparing potato dodol uses the potato (Solanum tuberosum L.) as the primary ingredient, and the ethnoscience study approach begins by examining the morphology and classification of potatoes. 10 kilograms of potatoes, 2 kilograms of flour, 8 kilograms of sugar, salt, and food coloring make up the ingredients.<br><br>Science concept:<br>Morphology and classification, Procedure |

| No | Question | Community Knowledge | Scientific Knowledge |
|---|---|---|---|
| | | dodol using safe and durable oil paper; (8) and finally labeling process in accordance with the established production feasibility criteria. | |
| 7 | What flavors do you have to get in potato dodol? | Flavors include avocado, pandan, strawberry, pineapple, palm sugar, and durian | Not only is it used as a vegetable, but the local community also uses this as an ingredient to make potato dodol as a snack with various flavors.<br>Science concept:<br>Flavors or food coloring |
| 8 | How long does it take for the potato dodol to dry after processing before it is packaged? | Potato dodol drying takes two to three days. | The excess water content in potato composition can be reduced by drying potato dodol in the sun for two to three days; if the weather is unfavorable, the drying process can take up to five days.<br>Science concept:<br>The role of energy in the production of potato dodol |
| 9 | What is the packaging process that is done after the dodol is dried? | The potato dodol is wrapped in oil paper and then put in mica plastic. | Potato dodol that has been drying is wrapped in oil paper and placed in mica plastic, up to 20 pieces each package.<br>Science concept:<br>Oil paper, mica plastic |
| 10 | Does the usage of a halal label to the potato dodol packaging comply by SJPH regulations? | Yes, it does, using a halal label in accordance with the regulations. | The usage of halal label for packaging potato dodol has been analyzed according to the criteria of the Halal Product Assurance System (SJPH)<br>Science concept:<br>Usage of halal label |
| 11 | When creating potato dodol, are there any changes to the ingredients not halal or the process? | In the process of manufacturing potato dodol, neither new not halal components nor procedural alterations are made. | There is no change in the method used to make potato dodol, and the ingredients have been guaranteed to be halal in accordance with the halal product guarantee standard (SJPH).<br>Science concept:<br>Components, steps, and ingredients |
| 12 | How long does potato dodol remain fresh after being packed? | One to three months | Sunlight during the drying process determines the quality of potato dodol to |

| No | Question | Community Knowledge | Scientific Knowledge |
|---|---|---|---|
| | | | keep it fresh after the drying process. When ingested, perfectly dry potato dodol is durable and still delicious. Without preservatives and packed, potato dodol can last one to three months.<br>Science concept:<br>Quality of sunlight, drying location, preservatives |

According to Table 1, community knowledge about how to make potato dodol is converted into scientific knowledge, showing that this expertise is acquired and developed from generation to generation, especially among family members. Arifin (2019) and Hadi et al. ( 2017) examined how local knowledge is transformed into scientific knowledge by reconstructing community knowledge into scientific concepts. Indigenous scientific investigations will be carried out in accordance with the cultural traditions of each location. The process of converting between empirical science and original science, which includes all knowledge about societal realities acquired from inherited beliefs and still includes myths. The scientific process produces knowledge that is more enduring (Dewi et al., 2019). The step in the process of making potato dodol includes: material preparation (potato), boiling, milling, mixing the dough with other ingredients such as coconut, sugar, salt and flavors or food coloring, kneading, potato dodol printing and cutting, drying, packaging and labeling. By developing the halal product assurance standards (SJPH) procedure through the study of ethnoscience, it is feasible to combine local knowledge of making potato dodol with the scientific knowledge essential for passing down local culture through education to the new generation (Table 2).

**Table 2**. The relationship process of making potato dodol and the basic competencies community knowledge into scientific knowledge using halal product guarantee standards (SJPH)

| No | Competency Standars | Science concepts in the process of making potato dodol |
|---|---|---|
| 1 | Describe the kind of potato used in making potato dodol | There are several types of potatoes that can be used in making dodol kentang, one of which is potato Granola is one type of potato that is widely found in Kerinci, has a yellow-white tuber meat color, has a soft texture and has a carbohydrate content of up to 20% |
| 2 | Explain the concept of materials and tools used in making potato dodol using halal product guarantee standards (SJPH) | The materials used consist of halal ingredients and tools must cleans and unclean free. |
| 3 | Analyze of concept procedure potatoes made into dodol | The procedure of making potatoes into potato dodol using traditional or conventional ways. The process of making potato dodol by the community knowledge can be interpreted into scientific knowledge. Every steps is carried out sequentially from preparation of tools and materials to packaging and suitable for public consumption. Procedure for making potato dodol has been analyzed according to the criteria of the Halal Product Assurance System (SJPH) |

Based on Table 2, the process of community reconstruction in creating potato dodol characterizes the information as it is obtained from generation to generation and applied experience through an ethnoscience study approach starting from preparation to labelling stage contains community knowledge to scientific procedure (Kencanawati, 2019). Sudarmin & Asyhar (2012) suggest that the process by which conventional scientific data can be converted into scientific knowledge is the same. A community can learn more about its distinctive cultures with the aid of ethnoscience. The recognition of culture as a fundamental (fundamental and significant) component of education as a medium for the expression and transmission of ideas as well as the expansion of knowledge forms the basis of learning from a cultural perspective (Agyeman & Erickson, 2012).

In research conducted by Walid et al. (2022) explains how common knowledge can be changed into scientific knowledge. Each step is explained through a set of organized methods and specific guidelines for identifying habits. For instance, in the process of preparing regionally specific food that is passed down from generation to generation. The traditional method of processing fundamental food items involves a number of procedures that can be translated into scientific principles and used as the foundation for learning processes that can be applied to topics education in general using ethnoscience procedures.

Determination of the procedure for making potato dodol Kerinci has been analyzed according to the criteria of the Halal Product Assurance System (SJPH) which includes: (a) Commitment and Responsibility; (b) Materials; (c) Halal Product Process (PPH) shows that (d) Products; (e) Monitoring and Evaluation. The reason non-Muslims choose to use halal products is because there is a guarantee of cleanliness, safety, and product quality for the entire production chain (Samori, Salleh, & Khalid, 2016). Producing halal products will be one of the manufacturers' competitive advantages in order to compete with other producers in the same industry (Waharani et al., 2018). This is accomplished by following procedures in accordance with the criteria of the Halal Product Assurance System (SJPH), also known as Halalan Thoyyiban. The elaboration of each stage will be detailed as follows: The stage of commitment and responsibility of business actors (D) has prepared a halal policy that contains a commitment to halal production obtained in the training process, but has not been fully socialized continuously in the production room and material suppliers even though it has halal status in producing potato dodol. The ingredients in making potato dodol have a halal certificate according to MUI standards. PPH in making potato dodol is ensured that (a) the production facilities are owned by the business actors themselves which are used specifically with a self-management system to produce potato dodol products. Production facilities owned by business actors are guaranteed not to occur cross-contamination with materials/products that are haram or unclean, including procedures for washing production facilities and procedures for taking samples of materials/products, (b) production procedures meet the criteria for facilities that have been determined. Materials used in the production process are only materials that have been approved by LPPOM MUI which are included in the list of materials, (c) procedures and processes for washing materials and equipment used for the washing process are not unclean/unclean materials, (d) the process of storing and handling materials is carried out in the storage kitchen so that there is no contamination of materials/products by unclean/unclean materials, (e) product traceability is carried out through the arrangement of recording the use of materials and production facilities of raw materials until the production kitchen is properly and completely documented.

The fundamental factor determining the success of halal logistics activities is the separation of halal and non-halal products to prevent contamination of halal products (Tan, Razali, & Husny, 2013). The process of supplying and producing food, cosmetics, medications, and medical items is subject to halal quality requirements, as are the services associated with these halal products

(Noordin et al., 2014). The product for making potato dodol has been inspected and comes from halal ingredients, processed according to Islamic law, both in the use of equipment, production facilities, packaging systems, storage and distribution that are not contaminated with non-halal ingredients. Meanwhile, monitoring and evaluation through internal audits and management reviews are known to have not been registered properly and in detail because there is no halal supervisor to BPJPH.

## 4. Conclusion

Based on the research results, it is known that the process of making potato dodol according to community knowledge, especially for business actors can be transformed into scientific knowledge that was acquired and developed from generation to generation. The procedure for making potato dodol which consists of preparing ingredients (selection of potatoes as the main gradient), boiling, milling, mixing the dough with other ingredients (additional ingredient), kneading, printing and cutting, drying, packaging and labeling is wrapped in oil paper and mica plastic and using a halal label in accordance with the regulations. The way of making potato dodol is the knowledge that is passed down from generation to generation, can be investigated from scientific concepts by using an ethnoscience study approach.is analyzed according to the criteria of the Halal Product Assurance System (SJPH), which includes: (a) Commitment and Responsibility; (b) Materials; (c) Halal Product Process (PPH); (d) Products; (e) Monitoring and Evaluation. So, the potato dodol meets the requirements for halal products for consumption by the public.

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