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Article

MIE LAKU LUR: CHICKEN EGGSHELL FORTIFIED PUMPKIN NOODLES AS AN EFFORT TO IMPROVE THE QUALITY OF INDONESIAN FOOD

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ABSTRACT

Indonesia as one of the agricultural countries in the world has vast agricultural land and abundant yields. This can encourage food diversification efforts through the use of more nutritious local food ingredients. Pumpkin can add nutritional values such as fiber, beta carotene, and various types of minerals that are not owned by flour-based noodles in general. Noodle dough usually uses eggs as a developer that has calcium value. Egg shells, often just thrown away, also have the potential as a noodle fortification ingredient because they contain high calcium and are beneficial in bone health. Considering the nutritional value and benefits of pumpkin and eggshell for the health of the body, it is necessary to innovate the processing of these materials. This study aims to make pumpkin noodles fortified with chicken eggshells as a nutritious and functional food alternative and to reduce the amount of wheat flour and eggshell waste. This research uses experiments with 3 stages, namely product manufacturing, organolpetic test through a 1-4 scale questionnaire, and shelf life test. The data obtained were analyzed descriptively qualitatively. The results showed that chicken eggshell fortified pumpkin noodles had a shelf life of approximately 10 days, while the organoleptic test results showed that people could consume and accept it to improve food quality.

INTRODUCTION

Indonesia is one of the agricultural countries in the world. This categorization is supported by the vast agricultural land and most of the population making a living in agriculture. The existence of vast agricultural land means that the natural resources in it are also abundant. Behind its advantages, the agricultural sector also has its weaknesses, namely the development of technology is still quite slow and the success of production is influenced by the presence of climate. Even so, agriculture can still be considered as a strategic and solutive sector to contribute to developing the economy in Indonesia because agriculture can

support the availability of food in society. As time goes by, population growth is increasing, so indirectly the need for food in society is certainly increasing. However, the increase is less realized by the community so that occasionally there can be an imbalance between foodstuffs and population growth. In addition, people's tendency towards one main food ingredient can also exacerbate the occurrence of a food crisis. To overcome this condition, a solution is needed, which can be done through food diversification. Food diversification is an effort to increase the consumption of diverse foods with balanced nutrition principles. The effort is basically in the form of innovation of certain food ingredients that can be done in several ways, such as utilizing food ingredients that are not widely known by the public, making familiar food ingredients more attractive, and improving the nutritional value of food ingredients that were originally nonfunctional to become functional. One example of food that is widely known by the public but less desirable is pumpkin.

Pumpkin or often known as waluh is a type of seasonal vegetable that has relatively good adaptability to various environmental conditions, and includes plants that are durable or have a long shelf life. According to research, each pumpkin consists of parts including, skin (12.5%), pulp (81.2%), seed nets and seeds (4.8%). Based on these parts, the pulp is the largest part compared to other parts, where this part is often utilized by the community to be processed into various foods.(Hamdi et al., 2017). In addition to having these advantages, pumpkin is also rich in nutrients in it such as vitamins and minerals which include beta carotene, calcium, phosphorus, sodium and potassium as well as antioxidants as an antidote to free radicals and even cancer. The nutritional content contained in pumpkin can support the health of the body, including preventing heart attacks, strokes, fever, migrants, diarrhea, and kidney disease (Subaktilah et al., 2021). Pumpkin is also a high-fiber food because it contains the minimum requirement for food fiber, which is 6%. The existence of pumpkin in Indonesia is quite abundant and almost found in every region but its utilization is still less than optimal. Based on data from the Central Statistics Agency, the average yield of pumpkin production throughout Indonesia ranges from 20-21 tons per hectare, while pumpkin consumption in Indonesia is still very low, which is less than 5 kg per capita per year (Statistik, n.d.). Pumpkin is often only utilized as a processed food product, such as compote, cake, dodol, biscuit, jelly, and sometimes even just steamed. In addition, pumpkin is usually sold at a low price. The benefits of pumpkin are many more, one of which is explained by research that pumpkin can act as a child's appetite enhancer, improve high blood pressure, prevent bladder disorders, cure stomach ulcers, improve dull skin and remove black spots. Although the existence of pumpkin in Indonesia is quite abundant, its utilization is still less than optimal and very limited (Wahyuni et al., 2018). However, the various advantages that pumpkin has are not matched by public knowledge of the potential for more processed food. Based on the nutritional content contained in pumpkin and including high fiber food, pumpkin has the potential to be processed into flour. This potential is certainly very beneficial for Indonesia because according to data from the Central Bureau of Statistics, in 2003 Indonesia imported relatively high wheat flour up to 343,144.9 tons, then in 2006 there was an increase in wheat flour imports to reach 536,961.6 tons. This increase in wheat flour import activity resulted in an increase in the price of wheat flour. Of course, the price increase is very troubling to the community because almost all processed food products utilize wheat flour (Respati, 2010). In addition to the nutritional value contained in pumpkin flour, there is a beta carotene content that shows a yellow or orange color that can be used to make noodles. utilized for making noodles. Therefore, an innovation is needed to substitute wheat flour, one of which can utilize pumpkin as a raw material for making various foods, such as noodles.

Noodles are processed from flour and other food additives that have been measured as needed. Noodles are a food that is widely favored by Indonesians from various circles and

often noodles are also used as a staple food because they are considered to be filling (Asviani & Ninsix, 2017). The assumption that noodles can fill you up if traced scientifically turns out to be due to the main content of noodles is carbohydrates in the form of starch. Despite containing carbohydrates, noodles currently do not contain fiber and other nutrients needed by the body. To optimize the nutritional content of noodles, it is necessary to add other ingredients that contain fiber, vitamins and minerals needed by the body, such as Vitamin A. It is not uncommon to know that vitamin A plays an important role in the sense of vision as well as one of the constituent components of eye pigments in the retina, so that if there is a deficiency of vitamin A, it will certainly cause disturbances or problems in the sense of vision. So, to anticipate this occurrence, alternative steps are needed through increasing vitamin A in noodle making which can be done by utilizing local commodities with lower prices but nutritious, one of which is yellow pumpkin. The use of pumpkin flour in making noodles is because the nutritional value contained in it is very useful. This is in accordance with research (Boham et al., 2015) which explains the nutritional content contained in pumpkin flour, namely carbohydrates 77, 65%, protein 5, 04%, fat 0.08%, crude fiber 2.90%. Besides being nutritious, pumpkin flour also has a distinctive aroma and color, namely yellow or orange, so that pumpkin flour can be a natural dye that makes noodle products more attractive while the use of artificial dyes can be reduced even (Anggreni et al., 2008).

In addition to pumpkin, another ingredient that has the potential as an addition in making noodles is chicken eggshells. Even though, the eggshell is a waste that is often discarded without being utilized or reprocessed. The amount of chicken eggshells is certainly increasing day by day because almost all Indonesians consume chicken eggs as their daily food needs. This will certainly have an impact on the accumulation of eggshell waste which leads to environmental pollution because eggshells have a main composition in the form of CaCO3 which causes pollution due to microbial activity in the environment. So that eggshells do not become useless waste, it requires processing efforts into materials that can be utilized by humans. One of the appropriate and environmentally friendly processing is to turn eggshells into flour, where the flour that will be produced will contain a high calcium content of 94% and the calcium content can be a perfect supplement for food ingredients. In addition to calcium content, eggshells have other nutritional content which includes, potassium phosphate 1% and magneisum carbonate 1%. The high calcium content in chicken eggshells, then this chicken eggshell flour can be utilized as a fortification that can add nutritional value to noodles. Based on the nutritional value and benefits of pumpkin and chicken eggshell as raw materials for making noodles, the product development is expected to be able to serve as an alternative food in food diversification that is functional and beneficial for the community.

METHODS

The research was conducted from April to June 2022 in Ponorogo Regency, East Java. This research is an experimental study consisting of 3 stages, namely product manufacturing, organoleptic test, and shelf-life test. The organoleptic test was conducted on untrained panelists of various ages, while the shelf-life test was conducted by storing the product in room temperature and cold temperature (refrigerator). The data from the organoleptic test and shelf-life test were analyzed descriptively qualitatively.

A. Chicken Egg Shell Fortified Pumpkin Noodle Making

Making pumpkin noodles fortified with chicken eggshells goes through several stages including the first stage, namely the preparation of pumpkin and chicken eggshells. The second stage is processing pumpkin and chicken eggshells into flour, then finally the third stage is making wet pumpkin noodles fortified with chicken eggshells. The initial stage was carried out by collecting the basic ingredients first, namely pumpkin and chicken eggshells. Then proceed to the second stage, namely

making pumpkin flour and chicken eggshell flour. In making pumpkin flour, the first thing to do is to wash the pumpkin by soaking it in salt water to avoid pesticide residues. After washing, the pumpkin skin is peeled and then separated from the pulp. After that, the pumpkin flesh is cut into thin slices so that it is easy to dry when dried in the sun and then dried in the sun for about 3-4 days or until it is completely dry. After the pumpkin pulp is dry, it is then mashed using a blender until it becomes flour and sifted using a sieve to get really fine flour. Do not forget to store in a tightly closed container so as not to be contaminated with free room temperature.

Meanwhile, for making chicken eggshell flour, the first thing to do is to wash the chicken eggshells. done is that the chicken eggshells are washed first until they are completely clean. After that, the eggshells are boiled in water for 5-10 minutes with the aim of kill pathogenic bacteria that are attached to the shell. Then the eggshell eggshells are allowed to cool, after which they are transferred in a container and dried in the sun for 3-4 hours. in the sun for 3-4 hours. The dried eggshells are then pulverized using a blender until they become flour. using a blender until it becomes flour and sifted using a sieve to get a really fine flour. to get a really fine flour. The last stage is making pumpkin noodle dough pumpkin noodle dough fortified with eggshells. The ingredients needed are wheat flour 250 g, tapioca flour 1 tbsp, pumpkin flour 25 g, chicken eggshell flour 40 g, water to taste, 1 tsp salt, 2 eggs, and enough cooking oil. While the ingredients used to cook ready-to-eat noodles are garlic, pepper, soy sauce, cooking oil, pepper, and flavouring. The tools needed in making fortified pumpkin noodles are chicken eggshells include besek or wooden tray, pot, blender, cutting board, knife, bowl, spoon, baking sheet, container, plastic brush, stove, chopsticks, sieve or strainer, and food tongs.

The steps taken to make chicken eggshell fortified pumpkin noodles are mixing all ingredients such as wheat flour, tapioca flour, pumpkin flour and chicken eggshell flour into the container little by little. Then 1 tsp salt and enough water are added. After all the ingredients are mixed, the dough is added to the egg and kneaded by hand until the dough becomes smooth. The dough that has been smooth, then divided into 8 parts to be thinned using chopsticks and then rolled. The rolled dough is then smeared with a little cooking oil before steaming so that it does not stick to the pan. Then the dough is steamed for approximately 20 minutes. After steaming, the dough is drained to cool so that it is easy to slice. So that the dough can be enjoyed like noodles, then after slicing the next step is boiled for 5 minutes then drained. After that, the noodles are sautéed with various seasoning ingredients, such as garlic, pepper, salt, flavouring, soy sauce, and cooking oil. After stir-frying, the noodles are ready to be served.

B. Shelf-Life Test

Shelf life is very important information for consumers because it is related to the safety of food products and to provide quality assurance when the product reaches consumers. The inclusion of information about shelf life has been emphasized that every food industry is required to include an expiration date on every food product package in accordance with Law No. 7 of 1996 concerning food and Government Regulation No. 69 of 1999 concerning Food Labels and Advertising (Harris & Fadli, 2014). In addition, shelf life is also defined as the time span for a food product starting from the production stage to the consumption stage before the products experience a decrease in physical quality and are not suitable for consumption. The shelf life test aims to find out how long the food product is to be consumed. The test procedure was carried out by storing pumpkin noodle samples at room temperature (left in free air) and not at room temperature (in the refrigerator). Storage at room temperature was carried

out from April 19, 2022 to April 25, 2022, while storage in the refrigerator was carried out from April 19 to April 28, 2022. For wet noodles (that have been cooked) only have a shelf life of approximately 2 hours. After storage, there was damage to this product seen through sensory parameters. The sensory parameters include changes in texture, changes in aroma, changes in colour and different flavours.

C. Organoleptic Test

Organoleptic test is a test that uses human senses as the main tool for measuring the acceptance of the product, where the senses used to assess the sensory properties of food properties, namely the senses of sight, touch, smell, and taste (Suryono, C., et al., 2018). This test uses the hedonic scale method of chicken eggshell fortified pumpkin noodles through panellist assessment based on the level of liking (Gabriela et al., 2021). The hedonic test has the principle of asking panellists for responses about their level of preference for food ingredients that are assessed in the form of a hedonic scale. This test in the food sector is often used to obtain consumer opinions on new products before marketing and is used to determine the products most favoured by consumers (Tarwendah, 2017).

The test was carried out with the procedure of filling out a questionnaire in the form of a test card given to 12 panellists ranging from children, teenagers to adults. Then for the scores obtained for texture, aroma and taste are written in the form of a scale of 1 to 4 which means 1 = dislike (TS), 2 = ordinary (B), 3 = like (S) and 4 = really like (SS).

RESULTS AND DISCUSSION

A. Pumpkin and Chicken Egg Shells can be processed into Wet Noodles

Pumpkin is part of seasonal vegetables in Indonesia which is rich in nutrients such as vitamins, minerals including beta carotene, calcium, phosphorus, sodium and potassium as well as antioxidants which certainly have a variety of health benefits but have not been widely utilized. Pumpkin can overcome dependence on the use of food raw materials that have chemical content and can also be used as an innovative processed food product among the community. But currently the utilization of pumpkin is still limited to processed food products that have the potential to not last long. Whereas without realizing it, the pumpkin flesh can not only be processed into foods that are often marketed but can also be made into flour with simple techniques, of course, using household tools in general. The texture of the flour produced from pumpkin is fine textured like wheat flour, tapioca flour and other flours. This fine-textured pumpkin flour is very suitable and suitable for processing into noodles. Likewise, the results of the color of pumpkin flour are characteristic of yellow and the color of the noodles also becomes yellow without coloring. In making pumpkin flour, it does not require special skills, just knowledge and intention to make it so that it is suitable when applied among the community. Pumpkin flour in processing is very easy and can be applied with other ingredients that are found around of course with quality and affordable prices. With the making of pumpkin flour applied with other ingredients, it is hoped that it will be able to improve and increase nutritional value and utilize local food ingredients in the community, especially in pumpkin noodles.

Meanwhile, chicken eggshells are a waste by-product of chicken eggs that are usually thrown away without being utilized or reprocessed. Chicken eggshells are rarely utilized and processed by humans as food ingredients. Without realizing it, chicken eggshells can be processed and are suitable for human consumption because they contain nutritional value, namely calcium which is quite high. It is unfortunate if people

do not make good use of this chicken eggshell considering the high nutritional content in it. So with this, the right solution to utilize chicken eggshells so that they are not wasted is to process them into flour which is then made into fortification ingredients in a food product such as wet noodles. The texture of the flour produced from eggshells is fine and slightly rough, different from the texture of wheat flour, tapioca flour and other flours. This slightly rough fine-textured chicken eggshell flour does not affect the processed food, namely wet noodles because it does not cause a fishy odor. Likewise, the results of the color of chicken eggshell flour are white like flour in general. In making chicken eggshell flour, it does not require special skills, just knowledge and intention to make it so that it is suitable when applied in the community with simple techniques and easily available tools.

With the existence of chicken eggshell fortified pumpkin noodles that have a characteristic texture, taste and aroma that is slightly different from other flours. However, by processing chicken eggshell flour into fortified wet noodles, it has a taste like noodles in general and also does not affect the appearance of the wet noodles. There is a slight change in the texture of the noodles which is slightly rough as a result of eggshell flour. Pumpkin noodles with chicken eggshell fortification have broad potential and opportunities to improve and increase the nutritional value, benefits and quality of food because of that the noodles can be accepted and are in great demand among the public judged by foods that contain many nutrients.

B. Shelf Life of Chicken Egg Shell Fortified Pumpkin Noodles

Chicken eggshell fortified pumpkin noodles is a food that has a long shelf life. Uncooked noodles are wrapped in zip lock plastic tightly and placed in two different places. The first is placed in a dry and non-humid place at room temperature, while the second storage place is placed at cold temperatures (refrigerator temperature). Although pumpkin noodles are a type of perishable wet food, these noodles can last approximately 6 days at room temperature and can last approximately 9 days at cold temperatures. The length of shelf life owned by the noodles shows that eggshell fortified pumpkin noodle products can last a long time even without preservatives. In addition, for these noodle products that have been processed or cooked can last approximately 2 days at room temperature.

Damage to chicken eggshell fortified pumpkin noodle products stored at room temperature is indicated by changes in the texture of the noodles that are more easily broken, the color fades on day 6, while at cold temperatures it is indicated by changes in texture that are harder but easily broken, a paler color than before, and a very strong rancid odor on day 9. The damage that occurs in chicken eggshell fortified pumpkin noodle products can be anticipated by packing them well to increase the shelf life of this product. In addition, the addition of salt to the noodles is not only a flavoring, but salt can also be a solidifier or hardener that makes the dough harder so that the starch composition in the noodles is stronger which minimizes the noodles breaking easily. In addition, salt can also inhibit the growth of mold, mildew, and bacteria and help the consistency of dough handling, so that indirectly, salt acts as a natural preservative (Ayu Eka Laksmi Dewi, 2020).

C. Community Acceptance

The acceptance level of chicken eggshell fortified pumpkin noodle product was shown through organoleptic test on 12 untrained panelists.

Table 1. Organoleptic Test Results of Chicken Egg Shell Fortified Pumpkin Noodles

Variable	Favorability Level			
	4 (Very Like)	3 (Like)	2 (Average)	1 (Dislike)
Aroma	4	6	2	0
Taste	0	9	3	0
Texture	3	3	6	0
Total	28	54	11	0
Total Score			93	
Interpretation		4 (Like)		

Based on table 1, it can be seen that the level of public acceptance of pumpkin noodles fortified with chicken eggshells is quite good. This can be seen from the rating scale in terms of aroma, taste, and texture. In terms of aroma, 33.3% really liked it, 50% liked it, and as many as 16.66% felt normal. Then in terms of taste, 75% liked it and 25% felt normal. While in terms of texture, as many as 25% really liked and quite liked, and the remaining 50% felt normal. Thus, it can be seen that both in terms of taste, aroma, and texture of chicken eggshell fortified pumpkin noodles are liked and accepted by all panelists, and this product has the opportunity to always improve the quality of the noodles produced in increasing nutritional value, economic value, as well as their beneficial value.

D. Halal Analysis of Pumpkin Noodles Fortified with Chicken Egg Shells

Table 2. The Results of Halal Analysis of Chicken Eggshell Fortified Pumpkin Noodles

No.	Overview	Type Tools/Materials/ Process	Halal Analysis			Description
			Halal	Doubtful	Non-Halal	
1	**Ingredients**	Wheat flour	✓			Already confirmed halal MUI
2		Tapioca flour	✓			Already confirmed halal MUI
3		Pumpkin	✓			Including ingredients that has been confirmed halal
4		Chicken egg shell		✓		There is no clarity on which ingredients are halal
5		Egg	✓			Including ingredients that has been confirmed halal
6		Garlic shallots	✓			Including ingredients that has been confirmed halal
7		Salt	✓			Already confirmed halal MUI
8		Water	✓			Including ingredients that has been confirmed halal
9		Sweet soy sauce	✓			Already confirmed halal MUI
10		Pepper	✓			Including

No.	Overview	Type Tools/Materials/ Process	Halal Analysis			Description
			Halal	Doubtful	Non-Halal	
						ingredients that has been confirmed halal
11		Flavoring	✓			Already confirmed halal MUI
12		Cooking oil	✓			Already confirmed halal MUI
13		Sugar	✓			Already confirmed halal MUI
14		Onion	✓			Including ingredients that has been confirmed halal
15	**Tools**	Bamboo Tray		✓		It needs to be reviewed for cleanliness because there is a possibility of contaminated with dirt or unclean
16		Pot	✓			Ensured halal
17		Synthetic Brush	✓			Ensured halal
18		Baking Sheet	✓			Ensured halal
19		Blender	✓			Ensured halal
20		Knife		✓		Still need to be reviewed for cleanliness (no rust and etc.)
21		Cutting Board	✓			Ensured halal
22		Bowl	✓			Ensured halal
23		Strainer	✓			Ensured halal
24		Chopsticks	✓			Ensured halal
25		Food Tongs	✓			Ensured halal
26		Stove	✓			Ensured halal
27	**Process**	Washing				Ensured halal
28		Drying		✓		Review of the cleanliness level of the mat and surrounding area
29		Blending or pulverization (blending)	✓			Ensured halal
30		Filtering or sieving	✓			Ensured halal
31		Kneading	✓			Ensured halal
32		Dough shaping	✓			Ensured halal
33		Dough steaming	✓			Ensured halal
34		Dough lifting and cooling	✓			Ensured halal
35		Cutting	✓			Ensured halal
36		Boiling	✓			Ensured halal
37		Sauteing and cooking the noodles until ready to serve	✓			Ensured halal

Based on this table, it shows that the ingredients used to conduct this experiment such as wheat flour, tapioca flour, pumpkin, chicken eggs, salt, water, sweet soy sauce,

garlic, pepper, flavoring (royco) and cooking oil include ingredients that have been It is confirmed halal by the Indonesian Ulema Council (MUI) because all have passed the feasibility test of product halalness where the law of origin of food is mubah, most of which are legal for consumption, while the eggshell ingredients need further research whether these ingredients are halal ingredients. Usually materials that are unclear about halal and haram products are categorized as syubhat. Furthermore, in terms of the tools used for practicum, namely pans, plastic brushes, baking sheets, blenders, wooden cutting boards, stainless steel containers or bowls and sieves are certainly halal. sieve is certainly halal to use. Although there are also tools that need to be reviewed in terms of in terms of cleanliness which may be contaminated with dirt or unclean such as baskets or bamboo tampahs and knives which may be contaminated with dirt or unclean or bamboo tampah and knives which may be contaminated with dirt or unclean.Apart from being dangerous, a rusty knife is also unhygienic. knives are also unhygienic.Rusty knives can also cause tetanus disease in those affected by them.to the body that is exposed to it.

Of all the processes carried out, there is one process that needs to be considered for its feasibility, namely drying. Dirty mats and surroundings can lead to mixing with substances that can harm consumers. It could be from dirty air attached to the food being dried. Such as the process of washing, smoothing or softening by blending, filtering or sieving, kneading, forming dough, steaming dough, lifting and cooling dough, cutting, boiling, sautéing and cooking noodles until ready to serve is certainly halal.

E. Follow-up Plan for Eggshell Fortified Pumpkin Noodle Product Development

After the implementation of food innovation, namely pumpkin noodles (laku noodles) with chicken eggshell fortification, to ensure nutritional value so that it is truly accepted by the community without hesitation, laboratory testing is needed such as testing the nutritional content of the ingredients used, such as the total plate number test. If there is a problem, namely there is a lack of standards to meet the nutritional value provided by food products, it is necessary to improve the formula of the ingredients used or replace these ingredients, for example, such as chicken eggshells replaced with quail eggshells, duck eggs or others.

Another effort that can be made in product development is to introduce this noodle product by holding or participating in Product Expo activities. By promoting product advantages, product benefits and so on. In addition, the public can also get to know more about this noodle in terms of taste, aroma and texture. There are many ways in product development efforts, one of which can also introduce products by participating in business plan competitions or innovative products at regional, national and international levels. Through expos and competitions, more people will know about this noodle product. In addition, there will also be many opportunities for us to market the product if the outside community is familiar with this product.

If the community wants to know more about the product such as how to make it, its composition, product manufacturing training can be conducted for the community such as mothers, entrepreneurs and so on. That way, we indirectly help increase community knowledge through educational socialisation and innovative product training. In addition, we realise that the use of local food ingredients is very beneficial because it contains a lot of good nutritional value and quality. The nutritional value will affect the health of the body by giving positive feedback through the food nutrition, therefore the fulfilment of nutritional value in the body is very necessary to be

improved, one way is by utilising local food around the environment, besides that it can also develop these products among the community.

CONCLUSION

Pumpkin and chicken eggshell waste can be processed into chicken eggshell fortified pumpkin noodles. The use of pumpkin can add fiber content to the noodles, while the fortification of chicken eggshells can add calcium value to noodle products. Chicken eggshell fortified pumpkin noodles have a shelf life that is not too long, approximately 10 days, because they are stored at normal room temperature and cold temperatures experiencing changes in color, texture, aroma and taste. The organoleptic test results indicate that chicken eggshell fortified pumpkin noodles, that people can consume and accept them to improve food quality. The results of the analysis of the halalness of the product in terms of materials, tools, and the manufacturing process show that the material that is still doubtful of its halalness is chicken eggshells, while the tool that still needs to be reviewed for its halalness is an unhygienic knife, and the process that is doubtful of its halalness is drying. The follow-up plan for this research is to conduct laboratory tests such as nutritional content tests and total plate number tests as well as if after being tested there is something that exceeds the standards given by food products, it is necessary to improve the formula of the ingredients used or replace these ingredients. Then if there is a shortage or does not meet the nutritional value of standard food needs, it can add other local ingredients which of course have better quality.

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