

PRODUCT INNOVATION (*LIDAH KUCING* PUMPKIN COOKIES AND PUMPKIN JAM) TO STRENGTHEN SMALL FOOD INDUSTRIES BASED ON PUMPKIN

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ABSTRACT

Product innovation is commonly regarded as a major success factor in aggressive and competitive food markets for both small and big food industries. As food technology, becoming a social responsibility to help small food industries to grow and face the competitive of food market. Pumpkin is one plant widely grown in Indonesia. The benefits and potential of pumpkin has been widely researched and proven contain high antioxidant, vitamin and mineral. This research have purpose to help small bussines food industries based on pumpkin in Getasan, Kopeng to develop a new inovative product. The objective is to make inovative product from pumpkin with simple method, easy to aplicate, but have highly added value. There are two innovation developed in this project, they are *lidah kucing* pumpkin cookies and pumpkin jam. This new product have great economic value, they can be sold at a good price range, and providing good profit for the small industries. The method used in this research are formulation of *lidah kucing* pumpkin cookies and pumpkin jam product. Also create marketing strategy to promote this product. Later, to reach national market acceptance can be set as the next goal, by utilizing modern marketing strategy, such as using social media for promoting, benchmarking, etc. Through those marketing strategies, in the long term, producing pumpkin food products can become the right arrow, to put a real step in food industry business. From this innovation product is then can enrich the product diversity and develop the entrepreneurship of local residents.

Keyword : *pumpkin, product innovation, cookies, jam, marketing*

1. INTRODUCTION

Small industries are the root of economic system in Indonesia. There are many small business, from garment, souvenir, until food business, which support and play important role in Indonesia's economic system. So that helping those small business to grow, is as same as helping strengthen economic system in Indonesia. As food technologist, becoming a social responsibility to help small food industries to grow and face the competitive of food market.

Pumpkin (*Cucurbita maxima Duch*) is local fruit from Indonesia which has high potential to contribute in food diversification. It has high nutrition such as protein, fat, carbohydrate, vitamin A, vitamin B, vitamin C, magnesium, and phosphor. Thus, this fruit has good effect for health especially for diabetic, hypertension, and allergic. Acceptable price and long shelf life of this pumpkin (Sudarto, 1993). It is another reason for processing it into functional product such as cookies and jam. Pumpkin is high in β -carotene, which gives it yellow or orange color. β -carotene in plants that have a pleasant yellow-orange color is a major source of vitamin A (Lee, 1983).

Getasan, one of a subdistrict in Semarang is located near tourism sites, Desa Wisata Kopeng. This site attracts local residents to participate and use the opportunity for industry, and food industry become one

option. Getasan is also well known with its agriculture crop product. One of its biggest commodity is pumpkin. Because of that, processing pumpkin into a new creative and innovative products is potential to increase local residents' wealth.

Lidah kucing cookies is one of favorit in Indonesia. This cookies have a form like a cat's tongue, so called *lidah kucing* in bahasa. Innovation on *lidah kucing* cookies it what the market needs at this time. This is because the time is close with Eid al-Fitr Day, and also perfect time to launch new cookies product. And mostly people like this cookies.

Besides cookies, consuming bread with jam for breakfast now being a new habit for Indonesian. Therefore, production of pumpkin jam will provide food product for better taste and maintain people's health because the nutrition content. Jam was made from fruit and sugar (Margono, 1993). The aim of this research is giving an innovative way to produce pumpkin jam and *lidah kucing* pumpkin cookies with simple technology which is expected have high competitiveness.

2. MATERIALS AND METHODS

2.1. The Program Target

This project is included in Service Learning Program in Getasan Village, Semarang. This program's aim is to help local residents develop their local commodity, to encourage

entrepreneurship, and then give impact to their increasing income. This program was conducted in 2 local entrepreneur. The first is Ibu Nurdjanah. Ibu Nurdjanah has a home industry named Rumah Waloe Rizky. This industry produce many kinds of creative pumpkin products. Now, this small industry has 11 kinds of product. The second one is Ibu Nanik, she also has a pumpkin based food home industry. Both of them distributed their product only in local areas.

2.2.Lidah kucing Pumpkin Cookies Making

Combine the butter and sugar in the bowl of a mixer, process until light and fluffy. Add egg whites, one at a time, mixing well after each. Add the flour, pumpkin and egg yolk, then mix it well. Put the batter into a piping bag, and pipe onto the sheet in a small and long shape. Bake them for 10 minutes (200 °C) until the cat's tongues are light golden brown. Cool the cookies on the baking sheet for seconds, and then transfer them to a wire rack to cool. Small sensory test are used to know the consumer acceptance for this product. In this research, preparation of pumpkin through three variables they are steamed, grated and use juicer then squeezes. And to find the best pumpkin cookies formulation, there are three formulation of each variable, the different is on the ratio between pumpkin and flour.

2.3.Pumpkin Jam Making

For making yellow pumpkin jam, firstly the pumpkin was mashed with blender and mixed with sugar then heated. After that, another material was added and stirred until dissolved.

Formulation 1 : Firstly the 1 kg pumpkin was mashed with blender and mixed with sugar then heated. Then, 2 g pectin and 1 kg sugar was added, stirred and put 3 g citric acid to heat together until boiled.

Formulation 2 : 167 g yellow pumpkin was mashed with blender and heated for 15 minutes together with 50 ml water. Then, 100 g sugar, 1,5 tsp citric acid, and 1 tsp agar powder was added gradually.

Formulation 3 : 250 g of yellow pumpkin shredded and heated. Then, 250 g sugar was added and stirred until dissolved. When the mixture started to thicken, agar powder and lemon juice was added.

3.RESULTS AND DISCUSSION

In this research the small food industry is a pumpkin based food industry. This small business produce many traditional food products from pumpkin. For example *geplak*, syrup, stick, and so on. This business is started by small family since years ago, and now become quite popular in central java province. However, looking at the 12 years business history, we can say that their

achievement is still less satisfactory. After years build this business, their market are still limited to central java province only.

We tried analyzing the problem, and found that there are 2 major problems in their business, which are :

1. They tend to lack in marketing aspect.
2. They aren't productive in making new pumpkin product innovation

First, regarding marketing problem, their business lacks in strategy. Their marketing strategy up until now, is just utilizing mouth-to-mouth strategy, and sometime through local magazine, which isn't give much. Local magazine only can reach central java market, because it only being sold in that area. While for mouth-to-mouth is worse, because it only effective to inform the society that live near the production site. As the result, their market is stagnant, only circle around central java area for 12 years.

This is such a pity, to see that they cannot reach bigger achievement, while their products are good quality and affordable. They have what is needed to be success, but they just don't know how. Nowadays, internet and social media is a very powerful tool to inform the society. Because everyone can easily have access to them, whenever, and wherever they are. Realizing this fact, its good to decide upgrade their marketing strategy, by utilizing those two items.

Internet and social media (using website and facebook application). Their record to promote business are already known and proven by other people before. Moreover, promoting through them don't require much amount of money. So in other word, tehy're effective and affordable. Very good and suitable combination for small business, which don't have much capital to begin with.

Second regarding new pumpkin food innovation. They only have some traditional products which are same and not developing since years ago. For example *geplak*, syrup, stick, and so on. As the matter of fact, those traditional foods actually are delicious. However, the problem here is the market being bored, because only meet same products from time to time. When there are another parties that produce more modern foods from pumpkin, their traditional food products start to lost in the market competition. For solving that problem, we tried to look for new pumpkin food product innovation. In this research, divided into two innovated product, they are *lidah kucing* pumpkin cookies and pumpkin jam.

3.1.Lidah kucing Pumpkin Cookies

Innovation *lidah kucing* cookies choose because this cookies liked by mostly people. And when this research did, its close by Eid al-Fitr Day. People who celebrate Eid al-Fitr Day, will need to buy delicious cookies to serve their family member, who come to their

home to strengthen their family bound. Looking at this moment, we believe that *lidah kucing* pumpkin cookies have big opportunity to be well accepted by society. It's extraordinary, delicious, full of nutrition, but still affordable one for serving even big family member. This cookies also can eat at normal day, because it is have a good taste, can became snack or can serve if guest come to our house.

For innovate *lidah kucing* pumpkin cookies, the flour will substitued with pumpkin, so it would reduce the amount of flour used. In addition, pumpkin also give spesific unique flavor to the cookies. In this research, preparation of pumpkin through three variables they are steamed, grated and use juicer then squeezes. And for find the best formulation through three formulation combine with three variables of pumpkin preparation. Steamed, grated, and use juicer is choosen because all of that method is easy to aplicate, and doesnt need complex method to do, compare with pumpkin pumpkin powder making. Pongjanta *et al.*(2003) revealed that pumpkin powder produced by juice extraction and cabinet drying then ground with pin mill and sifted through an 80 mesh sieve was cheap to produce.

Formulations of variable using juicer and squeezed can successfully due to the way of water removed with better than any other way. Then using juicer, the pumpkin has a

smooth pieces so the products can be slightly crunchy texture and strong pumpkin flavor (Table 1). After the formulation of the cookies, so followed by a small survey to inquire about the overall taste of the cookies. This survey also done by asking Ibu nanik and her husband about the overall taste of the final cookies.

3.2.Pumpkin Jam

Jam is a mixture of fruit that contains pectin and acid, also sugar added to make a thick and sticky but easy to spread (jam-like texture) mixture (BPTP Yogyakarta, 2013). Formulation became an important step to make the best quality and well accepted jam.

Table 1. Result of *lidah kucing* pumpkin cookies formulation

	Material	Formulation 1	Formulation 2	Formulation 3
Steamed	Margarine	100 gr	100 gr	100 gr
	Powdered sugar	100 gr	100 gr	100 gr
	Flour	50 gr	60 gr	75 gr
	Pumpkin	50 gr	40 gr	25 gr
	Egg whites	2	2	2
	Egg Yolk	1 tsp	1 tsp	1 tsp
Evaluation		Lost of pumpkin flavor, texture not crispy	Lost of pumpkin flavor, texture not crispy	Lost of pumpkin flavor, texture not crispy, but better than formulation 1 and 2
Grated	Margarine	100 gr	100 gr	100 gr
	Powdered sugar	100 gr	100 gr	100 gr
	Flour	50 gr	60 gr	75 gr
	Pumpkin	50 gr	40 gr	25 gr
	Egg whites	2	2	2
	Egg Yolk	1 tsp	1 tsp	1 tsp
Evaluation		Less pumpkin flavor, texture not crispy, there are chewy texture in gourd grate	Less pumpkin flavor, texture not crispy, there are chewy texture in gourd grate	Less pumpkin flavor, texture not crispy, there are chewy texture in gourd grate, but better than formulation 1 and 2
Use Juicer and squeezed	Margarine	100 gr	100 gr	100 gr
	Powdered sugar	100 gr	100 gr	70 gr
	Flour	50 gr	60 gr	75 gr
	Pumpkin	50 gr	40 gr	25 gr
	Egg whites	2	2	2
	Egg Yolk	1 tsp	1 tsp	1 tsp
Evaluation		The pumpkin flavor is tastes, texture crispy	The pumpkin flavor is tastes, texture crispy	The pumpkin flavor is tastes, texture more crispy than formulation 1 and 2, the sweetness good enough, because sugar revised to 70 gr.



Figure 1. Result of Formulation 1, Formulation 2, Formulation 3

Table 2. Texture Result of Jam Formulas

Formula	Materials Added	Texture
1	Pectin + citric acid	Watery, too soft, less thick
2	Citric acid + agar powder + water	Hard, difficult to spread
3	Lemon + agar powder	Thick, sticky, soft

There were 3 formula tried in this project. The first formula used pectin and citric acid, the second used citric acid, agar powder, and water, and the third formula used lemon and agar powder. The result shows that different formula yield in differences of physical appearance of product (Table 2). The first formula, which used pectin and citric acid had a watery texture, too soft and less thick. This formula didn't show the jam-like texture, which is thick and a little bit sticky. The pectin is basically contained in the fruit, but it is necessary to add more pectin, to use as gelling agent in making the jam-like texture. Meanwhile, the citric acid is used to strenghten the taste of the fruit (BPTP Yogyakarta, 2013). The proper level of acidity is critical to gel formation in making jam. If there is too little acid, the gel will never set but if too much, the gel will lose liquid (Albrecht, 2010). Based on this reference, too much citric acid added can be

a reason for the watery texture because the gelling formation is not happen. The second formula used citric acid, agar powder, and water. This mixture yield a hard texture of jam. Agar powder, alginate, pectin, carrageenan, and gelatin is gelling agent type

of hydrocolloids. This type disperse in water to give a thickening or viscosity producing effect. While all hydrocolloids thicken and impart stickiness to aqueous dispersions, a few biopolymers also have another major property of being able to form gels. Gel formation is the phenomenon involving the association or cross-linking of the polymer chains to form a three dimensional network that traps or immobilises the water within it to form a rigid structure that is resistant to flow. The textural and sensory properties also depend on the hydrocolloid employed (Glicksman, 1982). Adding too much agar powder could be the reason of the hardness of the jam.

The third formula shows the best texture and taste. This formula used lemon and agar powder. Citric acid can be replaced with lemon, which is more natural and easier to be found by local residents as Albrecht (2010) says that for fruit that low in acid content, such as pumpkin, material which contain acid ingredient can be used, such as lemon juice. Agar powder can act as gelling agent as well as pectin. The mixture of these more

natural materials yielded in best texture and taste of the jam.

Jam produced from formulation three then packaged into jam bottle. But, before filling the jam, the bottle was sterilized to kill all microorganism and prevent contamination (Winarno, 1994). Thus, the shelf life of jam will increase. This jam has market potential due to its taste and functional content.

4.CONCLUSION

The best formulation of *lidah kucing* pumpkin cookies using variable juicer and squeezed, then the best condition if we add sugar only 70 g. The best of jam making is formulation three, with condition of yellow pumpkin already shredded and heated, added with sugar and stirred until dissolved and started to thicken, agar powder and lemon juice was added after that.

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This service learning base food technology program is just an example to help each other and to apply capability of the student. Through identification problem, innovation and marketing product in the real world, may help the student to more understand about society and their knowledge.

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