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THE EFFECT OF THE USE OF MARGARINE AND BUTTER WITH DIFFERENT PERCENTAGES ON THE QUALITY OF SESAME MILK PIE

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Abstract

This study aims to determine the effect of using margarine and butter with different percentages on the physical and sensory qualities of sesame milk pies. The experimental method was carried out by differentiating the percentages of margarine and butter, namely 75%: 25%, 50%: 50%, and 25%: 75%. Physical quality was analyzed using the Anova test and sensory quality was analyzed using the Kruskal Wallis test with a significant level of =0.05. Physical quality in terms of diameter and weight did not show a significant effect. Physical quality in the aspect of inner thickness showed a significant effect with the highest yield on sesame milk pie 25%:75% with an increase of 40.53%, second on sesame milk pie 50%:50% with an increase of 38.10%, and the lowest 75 %:25% with an increase of 31.64%. Sensory quality in the aspect of crust color, deep color, milk aroma, and trigeminal showed no significant effect. Aspects of brittleness, softness, sweetness, and savory showed a significant influence. The friability aspect with the highest value of 3.53 (not brittle) at 75%:25% product, the second 3.07 (slightly brittle) at 50%:50% product, and the lowest 2.47 (brittle) in 25%:75 product %. The softness aspect with the highest value 4.25 (very soft) on the 25%:75% product, the second 3.53 (soft) on the 50%:50% product, the lowest 3.33 (slightly soft) on the 75%:25 product . Aspects of sweetness with the highest value 4.53 (sweet) in the product 25%:75% and 50%:50%, the lowest value 3.6 (slightly sweet) in the product 75%:25. Aspects of savory taste with the highest value of 4.53 (savory) on products 75%:25, and the lowest value of 3.8 (slightly savory) on products of 50%:50% and 25%:75%. Based on the results of the highest assessment of the sesame milk pie with the best quality, the ratio of margarine and butter is 25%:75%.

Keywords: *margarine, butter, sesame milk pie, physical quality, sensory quality*

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INTRODUCTION

Margarine and butter also have different characteristics so that their use in making cakes greatly affects the aroma, taste, and texture of the cake. Margarine is a fat of vegetable origin, usually palm oil. Butter is a fat that comes from animal milk. Butter contains less water than margarine, and tastes better. Butter has a lower melting point than margarine so it will make the texture softer. In terms of the price, butter is much more expensive than margarine because the raw materials and manufacturing process are more expensive (Surjani Ananto, 2012).

One of the cakes that use margarine or butter is milk pie. Milk pies use margarine or butter in making pie crusts. According to (Prakoso, 2012) the most important thing from a delicious pie is the skin, or what is commonly called the pie crust. A good pie crust is one that is crunchy and crumbly, but not crumbly. The taste can be sweet or savory, depending on the contents. The main parts of the pie crust are liquid, flour, and fat, with different compositions depending on individual

needs. In this study, researchers wanted to find out how much fat and what type of fat was best used in making milk pie crust.

Milk pie is a small snack with a unique shape, thin round, about 7 cm in diameter with milk inside, consisting of a mixture of sugar, flour, eggs and butter. Pies are usually served as a dessert. This pie is very easy to make and suitable for serving as a guest or family snack when relaxing (Manurung, Wrasiati, & Yoga, 2015) . Milk pie is one of the cakes that are widely sold as souvenirs in Indonesian cities. Starting from a souvenir industry in Bali that makes milk pies in dry form so that milk pies can become durable souvenirs to take out of town.

This research is expected to find out the best milk pie formula that produces milk pies with a firm shape and texture so that milk pies can be whole in long distance delivery via package delivery, as well as aroma and taste that are delicious and liked by the public. The pie crust in milk pie is baked along with the liquid filling. This affects the texture of the crust and the softness of the pie crust, in contrast to other pies where the skin is baked first and then the filling is added. Pie rind and milk filling are both cooked to dry at the same time, the ratio of margarine and butter with different percentages will determine which pie crust dough is suitable for milk pies. Milk pies have been sold in the market with various types. From milk pies with a variety of vanilla, chocolate and strawberry flavors to milk pies topped with raisins, almonds and cheese. To create a new flavor innovation, the researchers added sesame seed topping on top of the milk pie filling.

METHOD

The method used in testing the quality of the sesame milk pie product in this study was experimental. This research was carried out in 2 stages, namely making sesame milk pies and conducting quality tests on 3 treatments using margarine and butter on sesame milk pies which included physical and sensory aspects. Formula 3 treatment is attached in table 1.

Table 1. Formula 3 Treatment of Sesame Milk Pie

Ingredients	F2	F3	F4	%
TPT	150 gr	150 gr	150 gr	30%
TPS	300 gr	300 gr	300 gr	60%
Maizena	50 gr	50 gr	50 gr	10%
Granulated sugar	150 gr	150 gr	150 gr	30%
Baking powder	2.50 gr	2.50 gr	2.50 gr	0.5%
Salt	5 gr	5 gr	5 gr	1%
Vanilla powder	2.50 gr	2.50 gr	2.50 gr	0.5%

Margarine	187, 5 gr	125 gr	62.5 gr	50%
Butter	62.5 gr	125 gr	187.5 gr	
Egg	50 gr	50 gr	50 gr	10%

Description:
F1 = sesame milk pie, ratio of margarine and butter 75%:25%
F2 = milk pie sesame margarine and butter ratio 50%:50%
F3 = sesame milk pie margarine and butter ratio 25%:75%

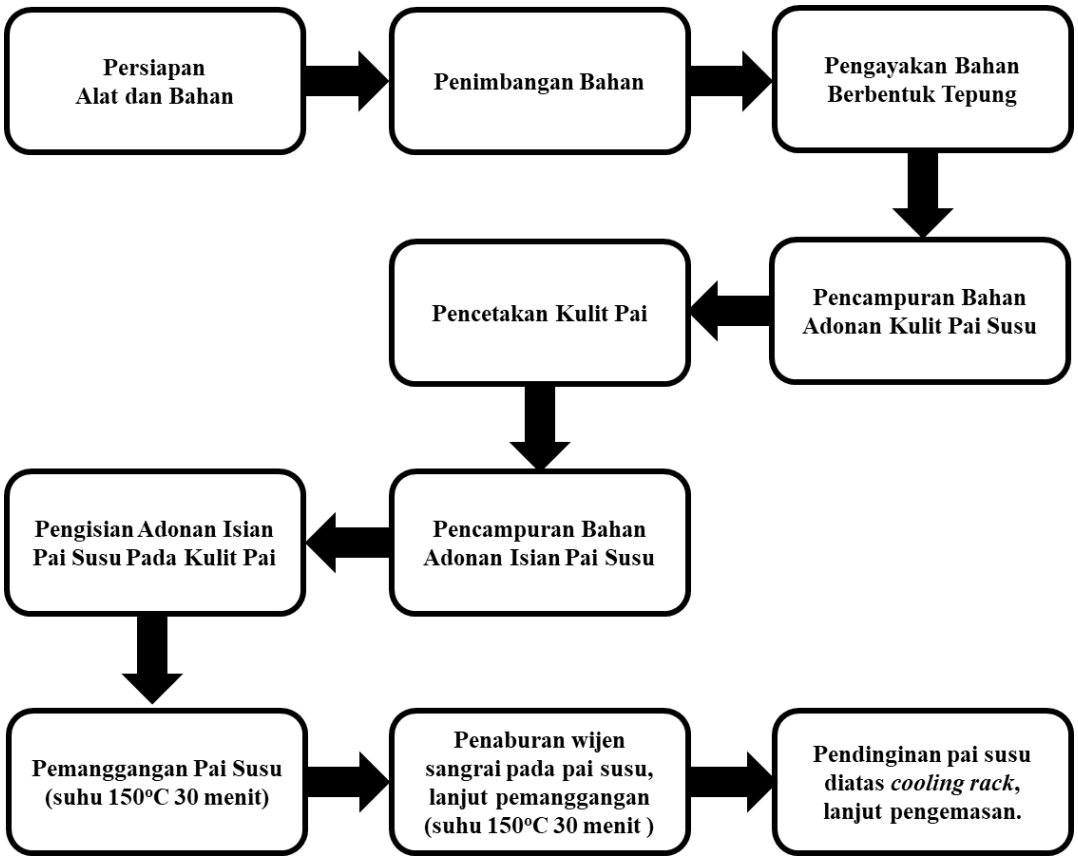

Figure 1. Sesame Milk Pie Making Process Chart

Data Collection Techniques

The data collection technique carried out by the researchers was to test the sensory quality by giving a sensory quality test form with a hedonic quality level to moderately trained panelists of 15 panelists who were students majoring in Catering who had passed the Continental Cake Processing course. The three product samples were given to the panelists one by one sample with a tasting distance of 2 hours to be assessed on the sensory quality test instrument form. Only researchers know the difference in the comparison of margarine and butter in each product. The

second data collection technique is to do a physical quality test by measuring the thickness and diameter of the sesame milk pie using a caliper with 6 repetitions and weighing the weight of the sesame milk pie with repetitions. 6 times.

Data

Analysis The data analysis used in this study to test the physical quality of sesame milk pie products with aspects of expandability and shrinkage was the non-factorial Anova Completely Randomized Design (CRD), the analysis was used to determine the effect of several treatments with a number of replications to become experimental units.

Analysis of the data used in this study to test the sensory quality of the sesame milk pie product was the *Kruskal-Wallis*, because the data obtained in this study were categorical data types. This analysis is used to test whether it is true that the groups being compared come from different populations, thus the difference is not only in the presence of samples drawn randomly from the same population.

RESULT AND DISCUSSION

Physical Quality Test Results

The results of the research on the different percentages of margarine and butter in sesame milk pies on the value of physical quality showed an increase in the thickness aspect, shrinkage in the diameter aspect, and shrinkage in the weight aspect with the data attached in table 2.
Butter 25%:75%

Table 2. Results of Physical Quality

Aspects	**Treatment**	**36.26**						**Amount**	**Average**
		1	2	3	4	5	6		
Thickness	F1	28.57	29.22	Repeated	33.10	32.54	30.16	189.85	31.64
	F2	37.92	42.79	38.06	35.92	36.62	37.30	228.61	38.10
	F3	41.59	52.13	40.33.33	35.21	40.33.33	40.58	Diameter	of
of	Test	3.81	2.47	2.24	2.92	2.27	2.58	16.29	2.72
	F2	1.25	2.72	2.59	3.45	2.88	2.29	15.18	2.53
	F3	2.41	3.00	1.94	2.66	2.45	0.40	12.86	2.14

Weight	F1	23.91	25.53	23.40	27.66	27.66	26.09	154.25	25.71
	F2	25.53	23.91	26.09	23.40.21	26.09	23.40	.	_
	_	_	_	_	_	21.74	21.74	141.91	23.65

Information:
F1 = sesame milk pie, ratio of margarine and butter 75%:25%
F2 = sesame milk pie, ratio of margarine and butter 50%:50%
F3 = sesame milk pie, ratio of margarine and butter 25%:75%

The results of the ANOVA test of the different percentages of margarine and butter in sesame milk pies on the value of physical quality showed a significant effect on the thickness aspect, while the diameter and weight aspects did not show a significant effect with the data attached in table 3.

Table 3. The results of the statistical test of physical quality

category	F_{count}	F_{table}	Conclusion
Thickness	6.61	3.68	$F_{count} > F_{table}$, There is a significant effect
Diameter	0.88	3.68	$F_{count} < F_{table}$, There is no significant effect
Weight	1.63	3.68	$F_{count} < F_{table}$, There is no significant effect

Sensory Quality Test Results

Data from the results of research on the percentage of different margarine and butter in sesame milk pies on the value of sensory quality (crust color, inner color, milk aroma, friability, softness, sweet taste, savory taste and trigeminal) are attached in table 4.
and butter 25%:75%

Table 4. Sensory Quality Test Results

Aspect	Treatment	Score	Description
Crust color	F1	4.53	Golden brown
	F2	4.07	Yellowish brown
	F3	4	Yellowish brown Deep
color	F1	3.6	Yellowish brown
	F2	3.47	brown
	F3	3.47 Light	brown
Milk aroma	F1	3.47	Slightly strong
	F2	3.53	Strong
	F3	4	Strong
Fragile	F1	3.53	Not brittle
	F2	3.07	Slightly brittle
	F3	2.47	Fragile
Tenderness	F1	3.33	Slightly soft
	F2	3.53	Soft
	F3	4.53	Very soft
Sweet taste	F1	3.6	Slightly sweet
	F2	4.53	Sweet
	F3	4.53	Sweet
savory	F1	4.53	Savory
	F2	3.8	Slightly savory
	F3	3.8	Slightly savory
Trigeminal	F1	3.87	Delicious
	F2	4	Delicious

	F3	4.27	Delicious

Description:
F1 = sesame milk pie, ratio of margarine and butter 75%:25%
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The results of the Kruskal Wallis test of different percentages of margarine and butter in sesame milk pies on the value of sensory quality showed a significant effect on the aspects of friability, softness, sweetness and savory taste, while aspects of crust color, inner color, milk aroma, and trigeminal did not. shows a significant effect with the data attached in table 5.

Table 5. Sensory Quality Statistics Test Results

Category	H_{count}	H_{table}	Conclusion
Crust color	3.64	5.99	$H_{count} < H_{table}$, There is no significant effect
Color in	-5.99	5.99	$H_{count} < H_{table}$, There is no significant effect
Milk aroma	2.04	5.99	$H_{count} < H_{table}$, There is no significant effect
Fragility	9.83	5.99	$H_{count} > H_{table}$, There is a significant effect
Softness	17.26	5.99	$H_{count} > H_{table}$, There is a significant effect
Sweet taste	30.51	5.99	$H_{count} > H_{table}$, There is a significant effect
Savory taste	6.34	5.99	$H_{count} > H_{table}$, There is a significant effect
Trigeminal	1.63	5.99	$H_{count} < H_{table}$,

	There is no significant effect

Physical Quality Test Results

The results of the research on the different percentages of margarine and butter in sesame milk pies on the value of physical quality show increase in thickness aspect, shrinkage in diameter aspect, and shrinkage in weight aspect with attached data in t abel 2.
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Milk aroma	F1	3.47	Slightly strong
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	F3	2.47	Fragile
Tenderness	F1	3.33	Slightly soft
	F2	3.53	Soft
	F3	4.53	Very soft
Sweet taste	F1	3.6	Slightly sweet
	F2	4.53	Sweet
	F3	4.53	Sweet
savory	F1	4.53	Savory
	F2	3.8	Slightly savory
	F3	3.8	Slightly savory
Trigeminal	F1	3.87	Delicious
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Softness	17.26	5.99	$H_{count} > H_{table}$, There is a significant effect
Sweet taste	30.51	5.99	$H_{count} > H_{table}$, There is a significant effect
Savory taste	6.34	5.99	$H_{count} > H_{table}$, There is a significant effect
Trigeminal	1.63	5.99	$H_{count} < H_{table}$, There is no significant effect

DISCUSSION

a. Physical Quality Test

The physical quality of the sesame milk pie in terms of thickness showed an increase in thickness after baking. The sesame milk pie was measured in 6 replications by measuring the thickness before and after baking which was presented as an increase in thickness, then the results of the non-factorial ANOVA test showed that there was an effect of different percentages of margarine and butter on the sesame milk pie on the aspect of thickness, with an increase in thickness. the first highest is 40.53% in sesame milk pie 25%:75%, the second highest thickness increase is 38.10% in sesame milk pie 50%:50% and the lowest thickness increase is 31.64% in milk pie sesame 75%:25%.

The physical quality of the sesame milk pies in the aspect of diameter shows the diameter shrinkage in the result after baking. Sesame milk pies were measured in 6 replicates by measuring the diameter before and after baking which was percentage as diameter shrinkage. Then the highest average diameter shrinkage was 2.72% for the sesame milk pie 75%: 25%, the second highest diameter was 2.53% for the sesame milk pie 50%: 50% and the lowest diameter was 2 .14% in sesame milk pie 25%:75%. However, in the non-factorial anova RAL test, it was found that there was no significant effect on sesame milk pies with different percentages of margarine and butter in terms of diameter.

The physical quality of the sesame milk pies in terms of weight showed weight loss in the yield after baking. The sesame milk pie was weighed in 6 replicates by weighing the weight before and after baking which was presented as a percentage of weight loss. Then the first highest average weight loss was 25.71% for the sesame milk pie 75%: 25%, the second highest weight loss was 24.82% for the sesame milk pie 50%: 50% and the lowest weight was 23. ,65% in sesame milk pie 25%:75%. However, in the non-factorial anova RAL test, it was found that there was no significant effect on sesame milk pies with different percentages of margarine and butter in terms of weight. Pies may shrink after baking because pie dough uses too much liquid. When baked, the liquid will evaporate so that the volume of the pie will shrink (Nimpuno, 2014). The water content in margarine is higher than the water content in butter, therefore formulas with a larger percentage of margarine experience the highest shrinkage compared to formulas with a smaller percentage of margarine.

b. Sensory Quality Test

The results of the sensory quality test of sesame milk pies with different ratios of margarine and butter on the aspect of crust color, inner color, milk aroma, and trigeminal did not have a significant effect. Meanwhile, there was a significant effect on the results of the sensory quality test in the aspects of friability, softness, sweetness, and savory taste of sesame milk pies.

The sensory quality of the sesame milk pies in terms of texture of friability showed the first highest rating, namely sesame milk pies with a ratio of margarine and butter 75%:25% on a non-brittle scale, the second highest rating was sesame milk pies with a ratio of margarine and butter 50%:50 % on the slightly crumbly scale, and the lowest rating of the sesame milk pie with a ratio of margarine and butter 25%:75% on the crumbly scale. In terms of softness texture, the first highest rating was sesame milk pie with a ratio of margarine and butter 25%:75% on a very soft scale, the second highest rating was sesame milk pie with a ratio of margarine and butter 50%:50% on a soft scale, and the lowest rating is sesame milk pie with a ratio of margarine and butter 75%:25% on a rather soft scale. Butter produces a cake that is crunchy and smells like milk. However, sometimes the resulting cookies are too brittle and crumble easily (Didi, 2015). Cakes that use margarine will produce cakes that are firm and stable, while pastries that use*butter* will produce a tastier and crispier taste, but will be easy todestroyed (Hani, 2014). This results in a less brittle result in formulas with a higher percentage of margarine, whereas in formulas with a higher percentage of butter the results are more brittle and softer in texture to sesame milk pies.

The sensory quality of the sesame milk pie in the aspect of sweetness showed the first highest rating, namely the sesame milk pie with a ratio of margarine and butter 25%:75% and 50%:50% on sweetness and the lowest rating of the sesame milk pie with a ratio of margarine and butter 75 %:25% on a slightly sweet scale. In the savory taste aspect, the first highest rating was sesame milk pie with a ratio of margarine and butter 75%:25% on the savory scale and the lowest rating was sesame milk pie with a ratio of margarine and butter 50%:50% and 25%:75% on somewhat savory scale. The fat used in this study is the type of *salted* and *unsalted*, this causes the pies to tend to taste sweeter in the formula with a higher percentage of margarine, and the formula with a higher percentage of butter tends to taste more savory.

CONCLUSION

Based on the highest average rating of sesame milk pies with the best recommended quality, the ratio of margarine and butter is 25%:75% with a formula consisting of 12.5% margarine (62.5gr), 37.5% butter (187, 5gr), 30% high protein flour (150gr), 60% medium protein flour (300gr), sugar 30% granulated sugar (150gr), 0.5% baking powder (2.5gr), 1% salt (5gr)), vanilla powder 0.5% (2.5gr), and eggs 10% (50gr). The advantages are in the aspect of a strong milk aroma, a very soft soft texture, a sweet sweet taste, and a trigeminal taste on a fine scale.

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