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The Use Of Banana Stem In The Making Of Dendeng Batokok

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ABSTRACT

Dendeng batokok is a processed culinary delicacy from West Sumatra or the Minang tribe that is made from beef or buffalo meat. The authors of this investigation substituted banana stems for beef. This study employs experimental research methodologies, with data gathered through observation, panelist evaluation, and a review of the literature. Meanwhile, the Organoleptic Test and Preference Test are being used for data analysis. The results showed that beef dendeng made from banana stems tasted similar to beef dendeng with higher nutritional value (calories, fat, and carbs) than beef dendeng with lower production costs.

Keywords: *Dendeng Batokok; Vegetarian; Banana Stem; Culinary; Minang.*

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1. Introduction

Indonesia is an archipelagic country with a diverse natural beauty and biological resources that the world community should develop and enjoy. As a result, Indonesia has a significant tourism potential. The key draw for both local and foreign tourists is the variety of Indonesian tourism spots available from diverse regions.

However, Indonesian tourism cannot function on its own. It takes the assistance of people or the local community to maintain and care for one of Indonesia's wealth sources. The community is also urged to help in the execution of tourism activities. The community's supportive participation will have an impact on both the regional economy and the Indonesian state. Aside from tourist attractions, Indonesian tourism has grown significantly, thanks in part to the backing of its culinary diversity. Tourists and even individuals living outside of Indonesia are familiar with Indonesian food. This is founded on the depth and breadth of Indonesian culture, which is spilled or reflected in its meals. The genuineness of the taste of the meal is also something that local and foreign tourists seek.

Dendeng batokok is one of the processed or culinary goods from West Sumatra or the Minang tribe that is in high demand by a broad audience. Dendeng batokok is a traditional Indonesian cuisine that has retained its unique taste and way of preparation until now. Dendeng batokok is often made from beef or buffalo meat. However, for various reasons, the meat's basic constituents may be altered or substituted with other commodities.

One method is to produce beef dendeng out of banana plants. Since banana trees contain a comprehensive nutritional content and a fibrous texture, they have the ability to meet the criterion for fibrous raw materials. This disease can cause banana trees to be used as a meat substitute for vegetarians and others who live a vegan lifestyle. Banana trees are not frequently used in the community and are usually destroyed due to their low economic worth (Matenggomena, Jurnal Culinaria, 2nd Edition, Volume I Number 2, March–August 2019).

People do not comprehend the nutritious worth of banana stem, thus the economic value is quite poor, in addition to the unpleasant taste. To boost the added value, numerous and fascinating banana tree processing studies must be carried out.

In addition to bananas, which are often consumed, banana stems have the property of bearing fruit just once on average. As a result, after harvesting the fruit, the banana stem will be chopped down and discarded. So far, banana stem waste has only been used for small- to medium-scale handicrafts, home cookery (typically stir-fried), and as a basic ingredient in manure. The remainder of the banana stem debris is rendered useless.

Waste, on the other hand, has become a common issue in Indonesia, particularly in urban areas. Organic waste is a common type of waste concern. Organic garbage accounts for 65-70 percent of municipal waste per cubic meter. The remaining 30-35 percent is inorganic garbage, which includes metal, plastic, paper, and glassware of various varieties. In 2006, Denpasar city produced 2,150 m3 of waste per day, Bandung produced 8,000 m3 per day, Surabaya produced 12,000-13,000 m3 per day, and Jakarta produced 26,000 m3 per day (Guntoro, 2013:5). The consequences aggravate the situation even further. Furthermore, trash disposal space is becoming increasingly scarce. People dislike trash and try to stay as far away from and avoid junk or waste as possible. Until now, rubbish and waste have frequently been a chronic problem, particularly in large cities. Coupled with the rapid urbanization generated by the expanding industrial sector in cities.

According to the Directorate of Regional Potential Development (2012) in Suwoto et al (2016:41), Riau province's

annual banana production in 2011 was 26,497 tons. Based on these figures, the banana waste potential is estimated to be 2,649,700 tons per year. According to Saragih (2013), when the bananas are picked, the banana plants are chopped down and the banana weevil is left to rot, becoming agricultural waste with no added value when these plants are no longer productive. This is due to the fact that the banana stem only bears fruit once in its lifetime. Banana stems, despite their appearance as waste, have a variety of uses. According to Wardhany (2014) in Marhamah (2014), banana stems have been shown to cure urinary tract infections, nourish hair, heal wounds, prevent postpartum bleeding, renal inflammation, syphilis, and a variety of other disorders. Banana stems are also commonly used by the people of NTT to cool the body and cure wounds.

2. Literature Review

2.1. Banana Stem

The banana stem is a berry plant that thrives in tropical areas. This monocot plant reproduces through budding. This plant can grow in practically any type of soil and requires no particular care. Communities, particularly in rural regions, frequently plant this tree in their yards or on abandoned property. As a result, bananas are widely available and plentiful in Indonesia.

Fibrous roots, stems, leaves, blossoms, and fruit make up banana stems. While the banana stem is separated into two pieces, the true stem, which is in the ground, and the false stem, which is on the ground surface and is cylindrical in shape. This false stem is also a layer of leaf midrib that covers one another, allowing the banana plant to stay upright. Banana stems lack a cambium, they are softer and hollow when compared to other plant stems. Banana stems are often light green-brown in color and rich in water.

Figure 1. Banana
Source: Author Documentation (2021)

Banana stems are frequently discarded as worthless rubbish. Banana stems, in reality, have a high commercial potential, including handicrafts and natural fertilizers. This item is only used in the food industry for stir fried and veggies. The nutritional value of banana stems is shown in the table below.:

Table 1. Banana stem content

Nutrient content	Banana ~~Steam~~ Stem
Dry Ingredients (%)	87,70
Ash (%)	25,12
Crude Fat (%)	14,23
Coarse Fiber (%)	29,40
Crude protein (%)	3,00
BETN (%)	28,24

Source: PEMKAB Purbalingga (2019)

In comparison to Beef, 100 g of Beef provides 201 calories, 66 g of water, 18.8 g of protein, 14 g of fat, 1.2 g of minerals, 11 g of calcium, 170 g of phosphorus, 2.8 g of iron, 9 mcg of vitamin B1, and 0.08 mg of vitamins (Suprapti, 2003:19). It can be determined that the banana stem has a considerable amount of fiber.

2.2. Product Introduction of Dendeng Batokok

The Minangkabau were the first to encounter dendeng batokok. Nevertheless, no one knows for certain who or where dendeng batokok was discovered. dendeng batokok is a type of evolution from regular Minang dendeng; the only difference is in

the processing technique, where dendeng batokok flattens the flesh by pounding or beating it, but regular dendeng is just sliced thinly to make a sheet. As beef and buffalo were plentiful during the period, the Minang people frequently used them as the major ingredients. The addition of green chili sauce to dendeng batokok is simply for flavor and nutritional enrichment.

Dendeng is a traditional or conventional dried meat processed product that is the result of a combined curing and drying process, by cutting into a medium thickness, which is then flattened by pounding or beating to achieve the desired thickness, then added salt, sugar, and spices in the form of spices such as coriander, garlic, onion, and ginger.

Dendeng batokok is a culinary product with significant potential to be utilized as a meal and become more well known in the community. As a result, this dish deserves to be expanded and reinvented into more items in order to boost sales and grow new markets.

3. Materials and Methods

The research method used is an experimental research method. Untari (2018:4) states that:

Since all of the ideas and norms of quantitative research may be applied to this method, experimental research is the most purely quantitative. Although experimental research can be conducted outside of the laboratory, the concepts of experimental research are used in its execution. This procedure is known as validation or testing, and it involves determining the effect of one or more variables on other variables.

In this study, data was gathered by observation, panelist evaluation, and a literature review. Meanwhile, the Organoleptic Test and Preference Test are being used for data analysis.

4. Results and Discussion

4.1. Result

4.1.1. Pre-experiment

The authors did pre-experiments twice and experiments twice prior to the study. Since each experiment was carried out in a different technique or manufacturing process, the outcomes of each experiment were varied. The findings of each experiment conducted by the author are listed below.:

Figure 2. Pre-experiment 1
Source: Author Documentation (2021)

On September 15, 2021, Pre-Experiment 1 was held, and dendeng batokok was created utilizing banana stems in the centre that were entire and not mashed first. The banana stems are then dried in the sun to dry in direct sunlight. As a result, the banana stem fiber becomes hard, dry, and abrasive, making it impossible to swallow.

Figure 3. Pre-experiment 2
Source: Author Documentation (2021)

The author adjusted the processing method in Pre-Experiment 2, which was held on September 21, by first cutting the banana stems into thin strips and then boiling them. The banana stems are then mashed and mixed with fine spices and tapioca flour. The dendeng dough is then flattened and fried till golden brown.

dendeng is crispy and can be ingested as a result, but the fiber is too fine and does not resemble meat, and the shape is far from beef fiber.

4.1.2. Experiment

Figure 4. Experiment 1
Source: Author Documentation (2021)

The fifth experiment of the authors was held on September 27, 2021, using the same manner as on September 21, 2021. The thickness of the banana stems was the difference. The end product is dendeng with more fiber, but it is still not beef dendeng.

Figure 5. Experiment 2
Source: Author Documentation (2021)

Experiment 2 took place on October 23, 2021. The author utilized a reddish green banana stem in this final experiment. Before being fried, the processing procedure is also added to the *ungkep* process. To make the banana stem smoother and simpler to chew, the author eliminates the exterior fiber. As a result, the fiber, structure, and flavor of dendeng become more similar to Beef dendeng batokok. The experiment 2 result was used as the final result.

4.1.3. Results of Taste Assessment by Professional Panelists

Table 2. Professional Panelist Assessment Score on Dendeng Batokok Banana stem.

Assessment Aspect	(1)	(2)	(3)	(4)	(5)	Total
Flavor	0	0	2	20	8	30
Aroma	0	0	4	20	6	30
Texture	0	0	7	13	10	30
color	0	0	7	18	5	30

Source: Professional Panelist Assessment Results (2021)

The outcomes of the table above, meaning the evaluation of 10 (ten) expert panelists on banana stem dendeng batokok, are as follows:

a. In terms of flavor, 2 (two) panelists said it was very nice, 6 (six) panelists said it was wonderful, and 2 (two) panelists said it was fairly good.
b. In terms of aroma, 2 (two) panelists said it was extremely good, 3 (three) panelists said it was delicious, 4 (four) panelists said it was very tasty, and 1 (one) panelist said it was not tasty.
c. When it came to texture, 2 (two) panelists said it was very fibrous, 2 (two) panelists said it was fibrous, and 6 (six) panelists said it was very fibrous.
d. From the standpoint of color, 2 (two) panelists thought it was extremely intriguing, 5 (five) thought it was interesting, and 3 (three) thought it was fairly interesting.

4.1.4. Results of the Taste Assessment by Consumer Panelists

Table 3. Consumer Panelist's Assessment of Dendeng Batokok Banana stem

Assessment Aspect	(1)	(2)	(3)	(4)	(5)	Total
Flavor	0	0	2	6	2	10
Aroma	0	1	4	3	2	10
Texture	0	0	6	2	2	10
Color	0	0	3	5	2	10

Source: Consumer Panelist Assessment Results (2021)

The following are the findings from the aspect of the table above, namely the evaluation of 30 (thirty) consumer panelists on banana stem dendeng batokok:

a. In terms of flavor, 8 (eight) panelists thought it was very good, 20 (twenty) thought it was wonderful, and 2 (two) thought it was fairly nice.
b. In terms of aroma, 6 (six) panelists said it was extremely tasty, 20 (twenty) panelists said it was delicious, and 4 (four) panelists said it was fairly tasty.
c. Ten panelists indicated that it was very fibrous, 13 (thirteen) panelists noted that it was fibrous, and 7 (seven) panelists stated that it was fairly fibrous.
d. In terms of color, 5 (five) panelists thought it was extremely intriguing, 18 (eighteen) thought it was interesting, and 7 (seven) thought it was fairly interesting.

4.1.5. Nutritional Content of Banana Stem Dendeng Batokok

Table 4. Nutritional Information for Beef Dendeng

NO.	PARAMETER	UNIT	RESULT
1	Protein	%	55
2	Calories	Kcal/100 g	433
3	Carbohydrate	%	0
4	Fat	%	9

Source : Irma (2021)

Table 5. Nutritional Information for Banana Stem Dendeng Batokok

NO.	PARAMETER	UNIT	RESULT
1	Protein	%	6,49
2	Calories	Kcal/100 g	608,03
3	Carbohydrate	%	37,18
4	Fat	%	48,15

Source : Lab Test Results. PT. Saraswanti Indo Genetech (2021)

Based on the findings of the aforementioned test, it can be inferred that the protein level of beef dendeng is higher than that of banana stem dendeng batokok, which is 55 percent versus 6.49 percent for banana stem dendeng batokok. banana stem dendeng batokok has more carbohydrates than meat dendeng batokok, which has 37.18 percent versus 0 percent. The fat content of banana stem dendeng is higher than that of beef dendeng, at 48.15 percent vs 9 percent. Banana stem batokok dendeng has more calories than beef dendeng batokok, which has 608.03 kcal/100 g while beef dendeng batokok has 433 kcal/100 g.

4.1.6. Calculation of the Cost of Making Banana Stem Dendeng Batokok

The following is a cost breakdown based on the raw materials used in the production of meat and banana stem dendeng batokok:

Table 6. Calculation of the Cost of Beef Dendeng Batokok

Qty	Unit	Ingredients	Price (Rp)	Per (/)	Unit	Total (Rp)
500	g	Beef	88.990	/	1000	44.495
50	g	Shallot	31.000	/	1000	1.550
30	g	Garlic	26.000	/	1000	780
10	g	Coriander	22.444	/	100	2.244
15	g	Salt	22.800	/	1000	342
5	g	Sugar	24.800	/	1000	124
5	g	Beef Powder Broth	34.800	/	1000	174
5	g	White pepper powder	16.118	/	100	806
8	g	Ginger	56.000	/	1000	448
250	ml	Fried oil	19.500	/	1000	4.875
50	g	Curly Green Chili	28.667	/	1000	1.433
20	g	Cayenne Green Chili	23.333	/	100	4.666
30	g	Green Tomatoes	12.000	/	1000	360
Total						**60.748**

Source : Table 2.4 and Sayurbox (2021)

Table 7. Calculation of the Cost of Dendeng Batokok Banana Steam

Qty	Unit	Ingredients	Price (Rp)	Per (/)	Unit	Total (Rp)
500	g	Banana Steam	20.000	/	1000	10.000
50	g	Shallot	31.000	/	1000	1.550
30	g	Garlic	26.000	/	1000	780
10	g	Coriander	22.444	/	100	2.244
15	g	Salt	22.800	/	1000	342
5	g	Sugar	24.800	/	1000	124
15	g	Beef Powder Broth	34.800	/	1000	522
5	g	White pepper powder	16.118	/	100	806
8	g	Ginger	56.000	/	1000	448
250	ml	Fried oil	19.500	/	1000	4.875
50	g	Curly Green Chili	28.667	/	1000	1.433

Qty	Unit	Ingredients	Price (Rp)	Per (/)	Unit	Total (Rp)
20	g	Cayenne Green Chili	23.333	/	100	4.666
30	g	Green Tomatoes	12.000	/	1000	360
50	g	Tapioca flour	6.200	/	500	620
Total						**28.770**

Source: Table 2.5 and Sayurbox (2021)

4.2. Discussion

4.2.1. Assessment of Meat and Banana Stem Dendeng Batokok by Panelists

The results of all the above panelists for banana steam dendeng batokok from 40 panelists. The results of the total score for the assessment of the aspects of aroma, taste, texture and color are as follows: 1) The value of banana dendeng on the taste aspect from the sum of the assessment results of the Joint Panelists gets 166 points with an average value of 4.15 points. Thus, for the assessment of the taste of the Banana Stem Dendeng, it is delicious; 2) The value of banana stem dendeng batokok on the taste aspect of the combined panelists' assessment results obtained 158 points and an average of 4.06 points. Thus, the assessment of the taste of the banana stem dendeng is delicious; 3) The value of banana stem dendeng on the taste aspect from the combined assessment results of the Joint Panelists got 159 points and an average of 4.10 points. Thus, the assessment of aspects of the fibrous banana stem dendeng; 4) The value of banana stem dendeng on the taste aspect of the combined panelists' assessment results obtained 157 points and an average of 3.93 points. Thus, the color assessment of the banana stem dendeng is very interesting; and 5) For the overall aspect with a total score of 640 points and an average of 4.06 points. Thus, the aroma, taste, texture and color of the banana stem dendeng is considered delicious, tasty, fibrous and attractive.

4.2.2. Nutrition Comparison of Beef and Banana Stem Dendeng Batokok

Banana stems dendeng batokok have more calories, fat, and carbs than beef dendeng. However, banana stem dendeng provides less protein than beef dendeng.

4.2.3. Cost Comparison of Beef and Banana Stem Dendeng Batokok

The production cost of Banana Stem Dendeng Batokok is less than that of Beef Dendeng Batokok; the difference in production costs is Rp. 31,978 per 5 servings and Rp. 6,396 per serving. Due to the huge difference in production costs, banana steam dendeng batokok is a low-cost alternative and innovation in processed meat. This also boosts the commercial potential of banana stem dendeng batokok sales.

5. Conclusions

Overall, the flavor of the banana stem dendeng is similar to that of the beef dendeng.

Based on the nutritional parameters described previously, it is clear that banana stem dendeng contains more calories, fat, and carbs than beef dendeng. As a result, it is preferable as a full food or snack, and it can be ingested by persons who cannot eat meat at all (vegetarians). Since the major ingredient of beef has been replaced with banana stem, the protein content of banana stem dendeng is lower than that of beef dendeng.

Banana stem dendeng batokok is substantially less expensive to produce than meat dendeng batokok meat.

6. Acknowledgment

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