

Comparison of Quality Sliced Beef and Ground Beef Dendeng Commercials in Malang City

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Abstract— Dendeng is a processed product in the form of intermediate moisture of meat or ground meat that has been seasoned and then dried. The addition of spices, selection of raw materials, processing, and drying will affect the quality of the final beef dendeng product. The purpose of this study was to determine the comparison of quality sliced beef dendeng and ground beef dendeng in Malang city. The research method used was quantitative descriptive analysis, with 4 brand sliced of beef dendeng (S1, S2, S3, and S4) and 4 brand ground beef dendeng (G1, G2, G3, and G4). Selection of dendeng that already has a logo or brand in the city of Malang. Dendeng is obtained from traditional markets and supermarkets in Malang. Based on the results of the study, it is known that the quality of sliced beef dendeng products and commercial ground beef dendeng is different based on ash content, total acid, and sensory evaluation. It could be concluded that the addition of food additives and the processing process in making sliced beef dendeng and ground beef dendeng have an important role in the ash content, total acid, and sensory evaluation content. The comparison of the value of ash content and total acid content in ground beef dendeng has a high mean value compared to sliced beef dendeng, the color of the two types of commercial beef dendeng in Malang didn't gave significant different. The aroma and taste of ground beef dendeng is more preference by panelist than sliced beef dendeng.

Keywords— Sliced beef dendeng, ground beef dendeng, spices,, drying, nutritional content, traditional food.

I. INTRODUCTION

Food quality is a quality concept that can provide insight into how to maintain product quality and provide information to consumers about the food consumed. Good food is food that has good nutritional value and can meet human nutritional needs. Meat is a food that has good content, such as being rich in protein, minerals, vitamins, fats, and other substances needed by the body (Haq *et al.*, 2015). Meat is one of the food products that can easily be damaged because it is rich in substances that contain nitrogen, minerals, sensory evaluation, and high water content as well as the pH required by destructive and spoilage microorganisms for their growth. The growth of these microorganisms can result in unwanted physical and chemical changes so that the meat is damaged and is not suitable for consumption. We often encounter processing of products on meat, this is done to prevent the meat from being damaged. One of the processing of meat is beef dendeng. Dendeng is a processed product in the form of sliced or ground meat that has been seasoned and then dried (Kosim *et al.*, 2015). Dendeng has a distinctive taste and characteristics so that it has good acceptance by consumers. Good acceptance is used as an opportunity for producers to

make fast food in packs. The quality of dendeng is influenced by several factors, including the selection of raw materials, seasonings, processing, drying, and storage processes. Different factors will affect the final quality of the dendeng product. This study aims to determine the quality analysis of the differences between sliced beef dendeng and commercial ground beef dendeng circulating in Malang based on ash content, total acid, and sensory evaluation.

II. RESEARCH MATERIALS AND METHODS

A. Research Location

This research was carried out by the Central Laboratory of Life Sciences to test the levels of ash content and water activity, on the Laboratory of Food Quality and Safety Testing, Universitas Brawijaya for the total acid test, and for sensory evaluation testing using 5 expert panelists.

B. Research Methods

The research method used was quantitative descriptive analysis with 4 sliced of beef dendeng (S1, S2, S3, and S4) and 4 ground beef dendeng (G1, G2, G3, and G4). Selection of dendeng that already has a logo or brand that is circulating in the city of Malang. Dendeng is obtained from traditional markets and supermarkets in Malang.

C. Data Analysis

The data that has been obtained is then tabulated using Microsoft Excel. Data were analyzed statistically with calculations using a formula according to the method used. At this stage the results of the analysis and data processing that has been done will be discussed descriptively.

III. RESULTS AND DISCUSSION

Ash Content Value:

The mean value of ash content of ground beef dendeng and beef dendeng can be seen in Table 1. The ash content of ground and cut beef dendeng ranges from 6,44% to 11,40%. The mean value of the highest ash content of beef dendeng is in sample code G4 of 11,40%, while the lowest mean value of ash content of beef dendeng is in sample code S3 of 6,44%. The ash content value describes as a mixture of inorganic or mineral components found in foodstuffs which can indicate the total minerals. Below is described the mean value of ash content of sliced beef dendeng and ground beef dendeng can be seen in Table 1. The high value of ash content in beef dendeng in code G4 is thought to be due to the high addition of salt and sugar. This is in line with the research of Rahmani

et al. (2007) and Maisyaroh *et al.* (2018) that the mean ash content tends to increase with increasing salt concentration and soaking time. The increase in ash content is closely related to the addition of salt as an inorganic compound. The higher the salt content, the higher the ash content. the application of salt causes an increase in the number of minerals (especially sodium) in the meat so that the ash content also increases.

TABLE 1. The mean value of ash content of sliced beef dendeng and commercial ground beef dendeng products.

Sample Code	Ash Content (%) ± SD
S1	7.34±0.27
S2	10.99±0.07
S3	6.44±0.35
S4	10.47±0.28
G1	11.31±0.21
G2	9.01±0.28
G3	11.31±0.28
G4	11.40±0.42

Source: Primary Data Processed (2020)

The use of a higher concentration of brown sugar causes the fish dendeng product to burn easily and the resulting ash content is higher. This is also in line with the research of Erfiza *et al.*, (2018) which states that processing beef into products with the addition of spices can increase the value of the ash content by 1%.

The greater the value of air content in a foodstuff, the higher the ash content in the food. According to research by Huda and Evanuarini (2011) the higher the sugar content in the beef jerky making process, the higher the water content. Sugar holds important thinking in processing and food preservation in particular meat. When sugar is added to foodstuffs in a concentration which is high in dissolved solids then part of the existing air becomes not available for growth microorganisms.

The value of ground beef dendeng has a high value compared to cut beef dendeng. The mechanism for making ground beef dendeng is by mixing everything into one raw material and seasoning, make the dendeng into sheets, and the final drying process. The drying process in making beef dendeng uses the sunshine method and uses an oven with a temperature of 75⁰c with a duration of 6-8 hours. The high ash content in the ground beef dendeng is thought to be due to the long drying process. This is in line with Erni *et al.* research (2018) that the levels of taro tubers produced are influenced by temperature and drying time factors, the longer and higher the drying temperature used will increase the ash content because the water content that comes out of the food ingredients is getting bigger. Soedarmadji, *et al* (1989) that ash content depends on the type of material, method of ignition, time, and temperature used during drying as well as the lower the non-mineral components contained in the material will increase the percentage of ash relative to the material. Lubis (2008), that the content ash depends on the type of material, method of incubation, time and temperature used during drying and the lower the non-mineral components contained in the material will increase the percentage of ash relative to the material. Lisa, *et al.* (2015), that increasing drying temperature will tend to increase.

Total Acid:

The total mean value of sliced beef dendeng and ground beef dendeng can be seen in Table 2. The total acid value of ground and sliced beef dendeng ranges from 0.32 to 0.53. The mean total value of beef dendeng acid is found in sample code G1 of 0.53, While the lowest mean total acid value of beef dendeng is in the sample code S3 of 0.32. Total acid is the determination of the total concentration of acid contained in a food ingredient. Below is described the mean value of the total value of sliced beef dendeng and ground beef dendeng can be seen in Table 2. The high total acid value in beef dendeng in sample code G1 is 0.53 with the addition of tamarind in the process of making ground beef dendeng.

TABLE 2. The mean value of total acid the products of sliced beef dendeng and ground commercial beef dendeng.

Sample Code	Total Acid ± SD
S1	0.36±0.04
S2	0.33±0.02
S3	0.32±0.01
S4	0.45±0.05
G1	0.53±0.02
G2	0.36±0.03
G3	0.46±0.02
G4	0.34±0.03

Source: Primary Data Processed (2020)

This is in line with the results of research by Kemalawaty *et al.* (2019) that soaking chicken beef dendeng, adding the level of tamarind extract in each treatment will result in a low pH value. Soeparno (2005) states that this decrease in pH value is caused by tamarind which has an acidic pH so that the addition of the acid level increases the acidity which will decrease the pH value of the dendeng. Desniar *et al* (2009) states that the decrease in pH is due to a decrease in salt levels, where the NaCl compound will break down into its constituent molecules, namely Na⁺ and Cl⁻ ions. The Na⁺ ion is needed by lactic acid bacteria as a supporting factor for their growth. Cl⁻ ions bind to free water on materials that cause the availability of water in the material to decrease so that free water that can be used by microbes for their growth is reduced and causes the environment to become acidic due to the formation of the HCl compound. The acid concentration contained in the fermentation product affects the pH value. Increasing the concentration of lactic acid will be followed by an increase in the concentration of bound hydrogen ions so that the pH value decreases, or vice versa (Tamime, 2006). Meat is good food because the nutritional value contained in meat is very complete, such as protein, fat vitamins, and others needed by the body. According to Pranayanti and Sutrisno (2015), the availability of the number of nutrients will increase the number of bacterial cells and have an impact on maximum sugar reshuffling, so that the total acid will increase and the pH will decrease.

Sensory Evaluation

Sensory evaluation is a method of testing using the human senses as the main tool for measuring product acceptance. Sensory evaluation testing has an important role in the application of quality. The results of the sensory evaluation

test showed that the mean beef dendeng was black, with a hard texture, a slightly fragrant aroma of dendeng, and a rather strong flavor of the meat.

TABLE 3. The Sensory Evaluation Score Panelist Sliced Beef Dendeng and Ground Beef Dendeng.

	Color	Texture	Aroma	Taste
Sliced beef dendeng	4.60	4.50	2.85	2.85
Ground beef dendeng	4.30	3.85	3.05	3.35
Mean±SD	4.45±0.21	4.18±0.46	2.95±0.14	3.10±0.35

Color

The mean value of the research results on the color of sliced beef dendeng and ground beef dendeng in the city of Malang is 4.45. The results of the sensory evaluation study were the color of the beef dendeng, the beef dendeng, and the ground beef dendeng had brown black dominant characteristics in both samples. The brown black color in beef dendeng products is due to several factors, one of which is the addition of brown sugar. This is in line with Jauhari *et al.* (2005), the darker color of the ground beef dendeng is thought to be due to the fact that grinding can make the tissue fibers smooth and the meat juices containing hemoglobin will come out to the surface, the protein will react with glucose from the sugar as a result. Brownish color (*mailard*). The color of the dendeng product is influenced by the sugar content in the seasoning ingredients and the temperature used in the drying process. Kristanti (2008), states that the processed meat product in the form of dendeng is generally brown or blackish in color due to the maillard reaction that occurs while the dendeng is drying. Palm sugar generally has a variety of colors, ranging from yellow to brownish-black, the color of palm sugar used in the manufacture of sliced beef dendeng and ground beef dendeng will also affect the sensory evaluation quality of the color in the dendeng product.

Texture

The mean value of the research results on the texture of sliced beef dendeng and ground beef dendeng circulating in the city of Malang is 4.18. The results of the research on the texture of sliced beef dendeng and ground beef dendeng were dominant with a soft texture. Texture of sliced beef dendeng and ground beef dendeng is influenced by several factors, one of which is the drying process of the product. The drying process of beef dendeng using the oven method generally uses a temperature of around 75°C, the drying process also affects the texture of the final beef dendeng product. According to Bramblett *et al.* (1959) in Suradi (2009), that meat tenderness can be achieved by cooking meat at a temperature range of 57° - 60°C, because at that temperature myofibril protein does not harden, while heating at a temperature greater than the range 72°-74°C will cause hardening. protein so that the meat becomes tough, Meanwhile, according to Toldra (2004), the texture of a product that is produced depends on the amount of myofibrillar protein that is degraded, the degree of drying, the degree of connective tissue degradation in the meat. Another factor that affects the quality of the texture is the addition of

food additives such as sugar. The results of the research by Febrianingsih *et al.* (2016) show that the higher the palm sugar added to the dendeng, the more tender the dendeng will be, conversely the lower the palm sugar, the more tough the ground dendeng is the addition of palm sugar by 20% will produce a soft texture in the final product of beef dendeng.

Aroma

The mean value of the research results on the aroma of sliced beef dendeng and ground beef dendeng circulating in the city of Malang is 2.95. The sensory evaluation test results for the aroma of sliced beef dendeng and ground beef dendeng graded by expert panelist is medium, it means have an mean slightly fragrant aroma of beef dendeng, meaning that sliced beef dendeng and ground beef dendeng still have typical characteristics of beef dendeng in general. There are several factors that persist in the aroma of beef dendeng in the sample of this study, one of which is the addition of additional food, namely sugar. Mardiana (2011), that the higher the level of palm sugar added to the dendeng, the weaker the aroma of the meat will be, conversely the lower the level of palm sugar, the stronger the aroma of the meat will be. The flavor is a complex sensation involving smell, texture, pH, and temperature

Taste

The mean value of the research results on the taste of sliced beef dendeng and ground beef dendeng circulating in the city of Malang is 3.10. The results of the research on sensory evaluation flavors of sliced beef dendeng and ground beef dendeng graded by expert panelist is medium, it means have a rather strong taste of meat. The taste produced by these two types of beef dendeng is influenced by several factors, one of which is the addition of additional food, namely palm sugar. The results of research from Febrianingsih *et al.* (2016) show that ground beef dendeng with the addition of palm sugar by 10% has a strong taste, the aroma of beef. The spices used in making dendeng are dry products that give a delicious aroma, taste, and can give consumers a sense of interest to taste it. The addition of spices to dendeng produces phenolic content, high antioxidant activity, and improves the quality of dendeng (Suryati *et al.* 2013).

Sensory evaluation in the results of this study can be concluded that the addition of additional food, namely sugar is very influential on the final product of sliced beef dendeng and ground beef dendeng, giving 20% sugar is considered to be able to create a soft texture in beef dendeng. The drying process is also a factor in determining the texture of the beef dendeng product. The selection of raw materials and the addition of balanced spices is also considered as one of the factors that affect the aroma and taste to create a distinctive beef dendeng.

IV. LIMITATIONS OF THIS STUDY

1. Lack of research on studies of beef dendeng products to analyze the quality of commercial beef dendeng.

2. This study only analyzes the best quality in terms of physicochemical and sensory evaluation aspects without any additional treatment.

3. Samples (brands) are still very minimal, so the data obtained is limited.

V. CONCLUSION

It could be concluded that the addition of food additives and the processing process in making sliced beef dendeng and

ground beef dendeng have an important role in the ash content, total acid, and sensory evaluation content. The comparison of the value of ash content and total acid content in ground beef dendeng has a high mean value compared to sliced beef dendeng, the color of the two types of commercial beef dendeng in Malang didn't gave significant different. The aroma and taste of ground beef dendeng is more preference by panelist than sliced beef dendeng.

TABLE 4. Sensory evaluation characteristics of sliced beef dendeng and commercially ground beef dendeng are circulating in Malang.

Parameter	Characteristics	Sample Code							
		S1	S2	S3	S4	G1	G2	G3	G4
Color	Dark Brown	√		√	√	√	√		√
	Dark								
	Brownish red		√					√	
	Red								
	Deviate								
Texture	Very Soft			√			√		
	Soft	√	√		√	√		√	
	A little soft								√
	Hard								
	Deviate								
Aroma	Very like								
	like	√	√		√	√		√	
	Medium			√					√
	Dislike								
	Deviate								
Taste	Very like								
	like		√		√		√		√
	Medium	√		√		√		√	
	Dislike								
	Deviate								

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