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Analysis of Quality Rawon in Malang City Based on Ash Content, Texture and Sensory Evaluation with Spices Addition

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Abstract**—** *Spices are natural ingredients that are produced from plants and are used in the manufacture of traditional foods to give them flavor and can be used as preservatives. The use of spices in rawon is done to give flavor and extend shelf life. Rawon as a traditional food is favored by various groups, so it is necessary to analyze the quality and characteristics produced. The purpose of this study was to determine the quality rawon in Malang based on ash content, texture and sensory evaluation with spices addition. The research method used is quantitative descriptive analysis. Based on the results of the study, it is known that the addition of spices and the quality of rawon beef in Malang has good quality and nutritional content on the value of ash content, texture and sensory evaluation. The results of the study concluded that the best beef rawon circulating in Malang City based on ash content, texture and sensory evaluation was in Lowokwaru District with sample code R1*.

Keywords**—** *Nutritional Content, Rawon, Spices, Traditional Food*.

I. INTRODUCTION

Behind the many advantages possessed by beef, beef is perishable food that has low shelf life. One of the efforts that can be done to prevent damage is by handling and processing beef into rawon. Rawon is a type of black soup made from beef by adding various spices as the main ingredient for flavor production. Rawon as a traditional food is favored by various groups of people because it tastes delicious. The savory and delicious taste produced by Rawon comes from the spices used and the texture of the soft meat. The main factors that affect the texture and sensory evaluation quality of rawon are mostly influenced by the use of spices as the main ingredients such as kluwak, shallots, garlic, red chilies, galangal pecan, coriander, turmeric, pepper, salt and sugar. This is in line with Budianta research, (2019) which states that the main ingredients used in making rawon include turmeric, galangal, lemongrass, kaffir lime leaves, hazelnut, coriander, pepper, shallots, garlic, salt and sugar and the main seasonings. In the form of kluwak which can have an influence on the quality of the rawon produced. In making traditional food, the addition of food additives (BTP) may be done as long as paying attention to the maximum recommended amount. According to the RI Law Regulations. No. 18 of 2012 concerning food states that traditional food is food that already exists and is passed down from generation to generation with a simple processing process using BTP in the form of spices as a flavoring ingredient. However, the use of BTP must not exceed the threshold set by the Legislation at the time of food processing. The use of spices can produce a delicious taste and the relatively cheap price of rawon is the main factor for rawon being liked by many consumers. According to Choi research, (2016) states that several factors that can affect consumer interest and loyalty are influenced by prices, products, services, sales locations and attractive promotions given. As a traditional food, rawon still has several problems, such as the unknown quality of rawon circulating in Malang City and a poor perception of natural food so that changes need to be made so that traditional food becomes safe, healthy and fully accepted by the community. The use of spices has very diverse potential, especially in the manufacture of rawon. Its ability to provide natural flavors is supported by its functional properties so that it can preserve meat because it has no side effects and reduces contamination of microorganisms. The use of spices such as garlic, ginger and turmeric has a high level of antimicrobial activity when added to rawon because it can suppress bacterial growth and provide a natural flavor (Besung, Wulandari and Swacita, 2013).

II. RESEARCH MATERIALS AND METHODS

A. Research Location

Animal Products Technology Laboratory, Faculty of Animal Science, Universitas Brawijaya for product manufacturing as a control comparison. Laboratory of Food Quality and Safety Testing, Faculty of Agricultural Technology, Universitas Brawijaya for testing the ash content and texture. Sensory evaluation testing was carried out by 5 semi trained panelists. The research location was chosen because Malang City has various types of rawon which are quite legendary and famous.

B. Research Methods

The research method used is quantitative descriptive analysis. Sample taken from 5 traders in Malang City. The traders include those in Lowokwaru, Belimbing, Klojen, Sukun and Kedungkandang Districts. Sample 1 used spices in the form of kluwak, shallots, garlic, large red chilies, galangal, leeks, hazelnut, coriander, kencur, turmeric, pepper, ginger, cumin, pepper, lemongrass, kaffir lime leaves, bay leaves, salt and sugar. The sample 2 used spices in the form of kluwak, shallots, garlic, large red chilies, galangal, leeks, candlenuts, coriander, turmeric, pepper, ginger, kaffir lime leaves, salt and sugar. The sample 3 used spices in the form of kluwak, shallots, garlic, large red chilies, galangal, hazelnut, coriander,

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kencur, ginger, lemongrass, pepper, salt and sugar. The sample 4 used spices in the form of kluwak, shallots, garlic, large red chilies, galangal, leeks, candlenuts, coriander, pepper, ginger, cumin, kaffir lime leaves, salt and sugar. The sample 5 used spices in the form of kluwak, shallots, garlic, large red chilies, galangal, hazelnut, coriander, turmeric, ginger, pepper, bay leaves, cumin, salt and sugar.

C. Data Analysis

The data that has been obtained are 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 have been carried out will be discussed descriptively in order to obtain conclusions.

III. Results And Discussion

Ash Content Value:

Ash content value describes as a mixture of inorganic or mineral components found in foodstuffs indicating the total minerals. The ash content of rawon beef sold by traders has different values. This difference is presumably because each trader has different measurements, recipes and quality of meat used so that it can affect the value of the ash produced. Below is described the mean value of the ash content of beef rawon can be seen in Table 1.

TABLE 1. The Mean Value of Ash Content Rawon

Sample Code	Ash Content (%) ± SD
R0	6.41±0.14
R1	3.45±0.16
R2	4.05±0.21
R3	3.65±0.11
R4	4.38±0.28
R5	3.80±0.19

Source: Primary data processed, (2020)

The results of the research in Table 1 show that the rawon ash content of the beef being sold has various mean values. The mean value of ash content ranged from 3.45 - 6.41%. The lowest ash content value produced by R1 was 3.45 ± 0.16%. The highest value of ash content produced by R0 is 6.41 ± 0.14%. The high ash content value in the control rawon as a comparison is thought to be due to the processing of beef into rawon which is due to the high mineral content in the raw materials used. This is in line with the research of Erfiza, Hasni and Syahrina, (2018) which states that processing beef into a product with the addition of spices can increase the value of the ash content by 1%. According to the Codex Alimentarius Standard Study, (2005) the ash content of beef has a normal mean value of 1.2%. The value of the ash content in beef is influenced by several factors such as the breed of the cow, the age of the cow and the quality of the feed used (Agustina, Cahya, Widyantara, Swacita, Dharmayudha and Rudyanto, 2017). The high mineral content of spices is related to the water content of food ingredients. The high value of ash content in rawon can cause damage to foodstuffs so that other efforts are needed to extend the shelf life. Therefore, the addition of spices is necessary. According to Rahayu research, (2000) states that traditional spices such as rawon, curry, opor and curry have a low water content of 30-40% so that the initial microbial content ranges from 5-26 colonies per gram. In addition, other factors that cause the low number of microbes due to early cooking and the addition of salt to the spices can affect the amount of water activity and salt which is hygroscopic and able to absorb water from the meat tissue. Panelists' acceptance of the best rawon meat quality is in Lowokwaru District with the sample code R1 because it has the lowest ash content value.

Texture Value:

Texture or tenderness as an indicator in determining the best quality of rawon. This is in line with the research of Soeparno, (2005) which states that the quality of meat can be determined by physically observing it. Texture or tenderness is related to the fat content contained in meat in large quantities. The best quality is also produced because it uses fresh raw materials. Below is described the mean value of the texture or tenderness of beef rawon can be seen in Table 2.

TABLE 2. The Mean Value of Texture Rawon

Sample Code	Texture (%) ± SD
R0	24.06±0.13
R1	13.05±0.14
R2	20.70±0.16
R3	10.08±0.17
R4	25.47±0.22
R5	21.07±1.48

Source: Primary data processed, (2020)

The results of the research in Table 2 show that the texture or tenderness of the beef rawon being sold has various mean values. The mean texture or tenderness value ranged from 10.08 - 25.47%. The lowest texture value produced by R3 is 10.08 ± 0.17%. The highest texture value produced by R4 is 25.47 ± 0.22%. In the research results, the lowest texture score produced by R3 in Klojen District was 10.08 ± 0.17, which means that the best quality of beef rawon circulating in Malang City is in Klojen District. The method of assessing the texture or tenderness of beef is by feeling the surface of the rib eye muscles with the help of a flashlight then matching it with the standard of meat texture. Generally, meat texture standards are divided into three scores, namely smooth (9-12) medium (5-8) and coarse (1-4) (National Standardization Agency, 2008). This is in line with the research of Prasetyo, Padaga and Sawitri, (2013) which states that the smooth texture of the meat will produce tender meat. The low texture or tenderness value produced by traders in Klojen District is suspected to be due to boiling meat in a long time when the process cooking and there is use of the highest quality raw materials. The smooth texture of rawon is also caused by the presence of spices that act as natural preservatives. Toba, Hafid and Pagala, (2018) stated that giving galangal concentration was able to maintain the texture of the meat in smooth conditions.

Meat that has good quality can be characterized, if it is pressed with the fingers the meat fibers will not crumble and return to their original shape. Soeparno, (2005) added that antermortem factors include nation, species, physiology, age,

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management, gender and stress and postmortem includes withering, refrigeration and freezing. From the research data, it is clear that the rawon texture that is sold by traders in Klojen District when pressed, the texture will return and will not be destroyed. This indicates that traders in Klojen District use fresh raw materials with the appropriate cooking duration so that the panelists are more interested in consuming them.

Sensory Evaluation:

Sensory evaluation is a test that is carried out using human senses such as eyes, ears, nose, mouth to detect, differentiate, compare and the ability to express likes or dislikes (hedonic). The rating scale used is based on a scale of numbers 1 to 5 where a score of 5 is the best score. Sensory evaluation test results showed that the beef rawon was blackish brown, with a slightly smooth texture, the aroma of rawon did not deviate and the meat taste was rather strong.

Color

The average color of the beef rawon research results that are sold scattered in the city of Malang is favored by the panelists, namely blackish brown. This is because the brown color symbolizes the spices that permeate the dish so that it gives the rawon its natural color. The use of spices is thought to affect the sensory evaluation appearance of rawon. In the research data, it is known that the panelists' mean score was not much different. This shows that the beef rawon circulating in Malang City has almost similar sensory evaluation. From the research obtained, it is known that the panelists like rawon which has characteristics such as the color of the meat and the sauce is slightly blackish brown, the texture of the meat is soft or soft, produces an aroma that is not fishy rawon and produces a rather strong meat taste. According to the results of the study, the rawon which has these characteristics is in Lowokwaru Subdistrict. The rawon is widely liked by the panelists, presumably because of the use of quality beef and spices in their own kitchen recipes. The use of spices sold is dominated by kluwak which is added as much as 10% as a natural flavor producer and colorant to rawon. This is in line with Ayuningsih research, (2017) which states that the use of kluwak in the amount of 10% and the curing treatment after cooking for one full night can cause changes in the color of the meat and sauce to blackish brown due to the presence of tannins which can change the color of food. In addition, the tannin content in kluwak functions as antibacterial so that rawon has a long shelf life (Warnasih and Hasanah, 2018). The use of kluwak as a food coloring is allowed because it contains natural dyes in the form of FH chocolate brown and HT chocolate brown.

Texture

The average texture of beef rawon research results that are sold scattered in the city of Malang is favored by the panelists, which is rather smooth. This is because the slightly smooth texture of the rawon is easy to chew and not tough, besides that the spices as the main ingredient of flavor and preservatives can affect the level of tenderness in the rawon. In the research data, the mean panelist gave a rather fine texture assessment score on rawon. Rawon circulating in Lowokwaru District has a slightly smooth texture. The slightly smooth texture is thought to be due to the long cooking process of the meat. The process of boiling meat for 30 minutes to 1 hour at a temperature of 100^{o}C is able to give a soft texture to the rawon. This is in line with the research of Prasetyo, Nuhriawangsa and Swastike, (2012) which states that boiling beef can cause the juices in it to bind water so that the texture of the meat becomes soft. Boiling meat at 100^{o}C will produce good sensory evaluation properties and can be accepted by consumers. The boiling treatment itself has a function as preservation and can kill rotting microorganisms in meat (Estiasih and Ahmadi, 2009). Changes in beef during the boiling process that can be seen are in the form of changes in appearance, texture and reduced nutritional value (Sumnu and Sahin, 2005).

Aroma

The average aroma of beef rawon research results that are sold scattered in the city of Malang is liked by the panelists, namely it does not deviate. This is because if the meat smells distorted or fishy it can cause nausea when chewed. In addition, the role of aroma in producing food is very important because it can attract consumers. Rawon sold in Malang City has an aroma that does not deviate to the point that rawon is slightly different. The best aroma of rawon is produced by traders in Lowokwaru District with the assessment score not deviating from rawon. The aroma that does not deviate can cause the panelists to like it and minimize the feeling of being nauseous when consumed. This is presumably due to the use of spices in the right amount and dose so that it affects the aroma produced in rawon. This is in line with the research of Sari, Murtado and Muchsiri, (2016) which states that the presence of flavonoids in kluwak can remove the fishy aroma of rawon and act as a preservative. The best aroma from rawon is that it produces a distinctive taste of rawon meat and doesn't smell the slightest fishy on the meat.

Taste

The average taste of raw meat from research results that are sold scattered in Malang is preferred by the panelists, namely the strong taste of meat. This is due to the role of spices in producing the best rawon taste. Meat that tastes strong is also suspected because it uses the best quality and the right cooking method. The taste of rawon that the panelists liked was in the klojen, breadfruit and kedungkandang sub-districts. The rawon aroma value score shows that the rawon aroma sold in Malang City can be fully accepted by consumers. The aroma of rawon is related to the taste produced. Based on the results of the study, the average panelist gave a fairly strong assessment score for the taste of meat. The rather strong taste given by the panelists is allegedly due to the cooking for one full night so that the flavor-producing spices seep into the dish and produce a rather strong meat taste. Ayuningsih, (2017) adds that the strong taste of rawon is caused by the use of 15 kinds of spices so that it can produce a delicious and delicious taste when eaten.

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TABLE 3. Quality of Beef Rawon Products on Sensory Evaluation

Parameter	Characteristics	Sample Code				
		R1	R2	R3	R4	R5
Color	Black Dark brown Brownies red Brown Pale brown	√	√	√	√	√
Texture	Very smooth Smooth Rather smooth Rather rough Rough	√	√	√	√	√
Aroma	Very like Like Medium Dislike Deviate	√	√	√	√	√
Taste	Meat weak taste Weak taste of meat Meat taste rather weak Rather strong taste of meat Strong taste of meat	√	√	√	√	√

IV. Limitations of this Study

1. The rawon research data used is quite old and there is no renewable research.
2. This study only analyzes the best quality in terms of physicochemical and sensory evaluation aspects without any additional treatment.
3. This study only used one sample of rawon at each location of the sub-district so it was feared that it could not represent the level of people's preference for rawon.

V. Conclusion

The best beef rawon circulating in Malang City in terms of ash content, texture and sensory evaluation is in Lowokwaru District with sample code R1.

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