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A comparison of the sensory evaluation on the use of fresh and dried seasoning in beef rendang

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Abstract— Beef rendang is a popular traditional food from West Sumatra which is commonly cooked by using fresh seasoning such as herbs and spices yet not all types of those ingredients are effortlessly available to be found. This issue hinders the local community to cook beef rendang with the original taste of West Sumatra. As a matter of fact, producing dried seasoning to cook rendang could be a possible solution to solve this issue. This study aimed to compare the sensory analysis of beef rendang by using fresh and dried seasoning. This sort of research was a pure experiment with a completely randomized design and 3 repetitions. The ingredients being used are beef, coconut milk, chilies, ginger, galingale, lemongrass, shallots, garlic, lime leaves, bay leaves, turmeric leaves and salt, cooking oil, nutmeg and coriander purchased at traditional markets. The seasoning was sautéed and the coconut milk was poured into the pan, then the beef was added onto the coconut milk with the seasoning until it is half cooked in which the name is Kalio (Like curry, but not become rendang yet), then it was heated up and dried up for hours until the coconut milk dried and turned black which is called rendang. In addition, the data collection technique was carried out by giving a questionnaire to the panelists. The data analysis used was the t-test independent sample t-test using SPSS 15.0 software. The results obtained from the research showed that the average values of the sensory evaluation of the two rendang were almost similar. The average values of beef rendang sensory evaluation using fresh and dried seasoning, respectively, were colour 3.26 and 3.53; aroma 4.0 and 4.13; the texture has the same value, namely 3,4; taste namely 4,6 and 4,46 and the hedonic test 4,33 and 4,20. These results were likely identical as what the statistical test attained (t-test) that there are no significant differences between beef rendang using dried seasoning and fresh seasoning for each sensory testing.

Keywords: *Beef rendang, Dried seasoning, Fresh seasoning, Sensory evaluation*

I. INTRODUCTION

Beef Rendang is one of the traditional foods in West Sumatra favored by the local and foreign people (Dwi, 2019). In 2011 and 2017, rendang was labelled as the tastiest food in the world on the World's 50 Best Foods list (CNN, 2017). Beef rendang is a food that is processed using roasting or cooking using low heat technique (Hariadi, 2012). Beef rendang is cooked by using beef as the main ingredients, and then it is mixed with coconut milk and various herbs and spices (Melia et al., 2015). Spices and herbs are originated from aromatic plants in which those are used as the seasoning in the process of cooking. The functions of seasoning as a flavor are improving the aroma, flavor, and texture and stimulating the appetite (Astawan, 2020).

Based on the moisture content, there are 2 types of seasoning such as fresh seasoning (mashed fresh spice and herb) and dry seasoning (fresh spice and herb that are dried and then mashed into flour) (Hambali, 2005). The dried seasoning has the advantages of being practical and long lasting because of its low water content (Suliasih & Nurminabari, 2018). This is in line with Faridah et al., 2013 who states that dried seasoning like spices and herbs that have been through the drying process will last longer than the common ones.

Indonesian food, such as beef rendang, is categorized as challenging in the process of cooking and it takes time to be served. Nowadays, a lot of people want everything to be quick and practical. Thus, dried seasoning can be an option for making and serving food quickly and easily (Prasetyo et al., 2003). According to Kusumawardhani et al., (2017) cooking beef rendang using dried seasoning can be an efficient alternative because dried seasoning in the form of powder is more easily mixed in coconut

milk than the fresh seasoning. In fact, this occurs because the dried seasoning in the form of powder is easier to be mixed in the coconut milk, while the fresh seasoning is mashed, and it takes time to mix the seasoning. The process of producing dried seasoning includes slicing, drying, and grinding (Hambali, 2005). Thus, this study is aimed at comparing the sensory evaluation of beef rendang with the use of the fresh seasoning and the dried seasoning.

II. METHODS

In cooking beef rendang, fresh and dried seasoning ingredients are categorized as identical, yet its amount of dried seasoning in table 1 has been subtracted from the fresh seasoning so the amount of dried seasoning can be appropriate. As shown in the table below, the ingredients and the amount of beef rendang are:

Tabel 1. Beef Rendang Ingredients

No.	Ingredients	Fresh seasoning	Dried seasoning
1	Beef	1000 gr	1000 gr
2	Coconut milk	1000 ml	1000 ml
3	Onion	180 gr	24 gr
4	Garlic	35 gr	12,4 gr
5	Bay leaf	2 gr	0,4 gr
6	Lime leaf	2 gr	2 gr
7	Turmeric leaf	5 gr	0,4 gr
8	Lemongrass	20 gr	3,6 gr
9	Ginger	30 gr	3,2 gr
10	Galingale	100 gr	17,2 gr
11	Red Chili	150 gr	44 gr
12	Nutmeg	2 gr	2 gr
13	Coriander	4 gr	4 gr
14	Salt	32 gr	32 gr
15	Vegetable oil	60 gr	60 gr

This type of research is a pure experiment that was conducted during March until June 2020. The research design used was a completely randomized design (CRD) including 2 independent variables, dried seasoning, and fresh seasoning in cooking the beef rendang with three repetitions. In addition, the data collection technique used a questionnaire given to limited panelists, they are five culinary lecturers from FPP UNP. Additionally, the questionnaire contains sensory evaluation indicators of the product that must be observed by panelists including color, aroma, texture, taste, and hedonic (preference). This test consists of 5 levels in which the data was analyzed by using Independent sample t-test with SPSS 15.0 program.

The process of cooking beef rendang using fresh and dried seasoning are not different, but the method of making each seasoning is not similar. Furthermore, dried seasoning is processed by slicing, drying, and grinding spices and herbs. Meanwhile, the fresh seasoning is processed by refining the fresh spices and herbs. The procedure for cooking beef rendang can be seen in figure 1.

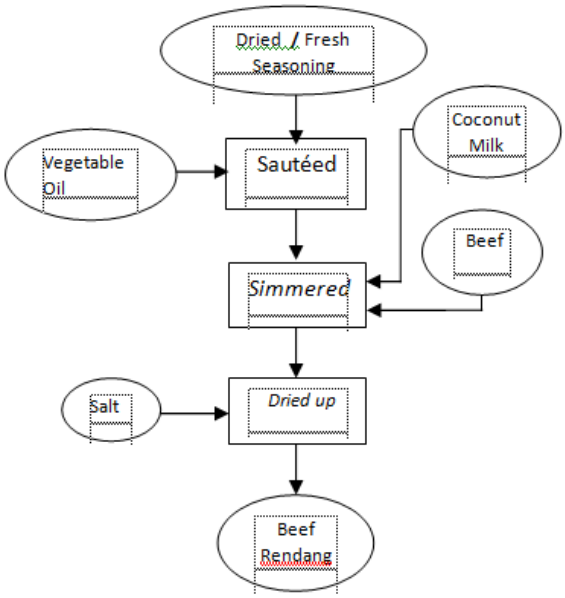

Figure 1. The chart of cooking beef rendang process

III. RESULTS

The results of the average value of beef rendang sensory evaluation using fresh and dried seasoning can be seen in figure 2.

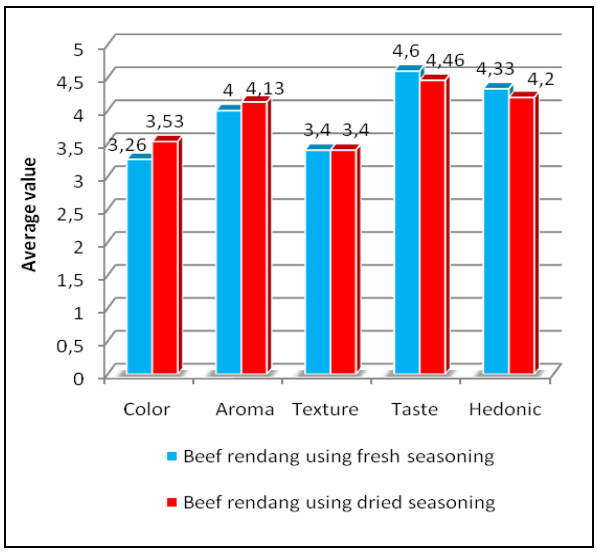

Figure 2. The average values of beef rendang sensory evaluation using dried seasoning and beef rendang using fresh seasoning.

After obtaining the results of the average values of all sensory evaluation indicators of the two treatments (beef rendang using fresh seasoning and beef rendang using dried seasoning), then the t-test was carried out. The summary of the t-test results for the sensory evaluation of beef rendang using fresh and dried seasoning can be seen in table 2.

Table 2. Summary of the results of the t-test for the sensory evaluation of beef rendang

Beef Rendang Sensory Evaluation	Df	T Count	T table	Sig
Color	8	0,496	2,306	0,05
Aroma	8	0,480	2,306	0,05
Texture	8	0	2,306	0,05
Taste	8	0,447	2,306	0,05
Hedonic	8	0,534	2,306	0,05

In addition, table 2 reveals that the calculated t count for all qualities is smaller than the t table value. Hence, it can be concluded that the hypothesis which states there is no sensory evaluation difference between beef rendang using dried seasoning and beef rendang using fresh seasoning is accepted.

IV. DISCUSSION

Based on figure 2, it can be seen that the best result of color in beef rendang using dry spices was 3.53 with a blackish-brown category. In fact, the color of beef rendang is blackish-brown because the cooking process lasted for five to six hours. Rini et al., (2016) explained that the blackish-brown color of rendang occurs because the cooking process lasts for hours with a temperature of 80°C - 90°C so that the colour of the rendang turns darker. Furthermore, there is a Maillard reaction in the cooking process. The Maillard reaction is a non-enzymatic browning reaction that occurs in reducing sugar and amino acid in the food when it is exposed to heat (Helena et al., 2011). The discolouration of the meat also occurs when it is cooked. In line with the idea, Wang et al., (2012) said that red meat (beef) colour can turn into brown due to the presence of myoglobin pigment, which could change its elements during the heating process.

The highest average value of aroma in figure 2 was found in the treatment of beef rendang using dried seasoning, 4.13 with the category of rendang aroma. The fragrant aroma of beef rendang was obtained from the use of various herbs and spices and the cooking process of meat rendang. In line with the finding, Nazir et al., (2018) states that the use of herbs and spices in rendang produces a specific aroma and taste in rendang. In addition, the aroma in rendang is produced by the Maillard reaction that occurred during the cooking process. Winarno (2003) stated that the aroma that comes out of food is caused by a Maillard reaction, this reaction does not only affect the colour but also affect the food texture and aroma. The specific aroma of beef rendang is also produced from the use of coconut milk. This is supported by the finding of Prasetio (2014) that coconut milk contains *nonylmethylketone* compound, if this compound is heated, it will be volatile which is causing a distinctive aroma.

The results showed that the aroma of beef rendang was more fragranced when the dried seasoning was used. It might happen because the use of dried seasoning, specifically when the dried seasoning is heated, the compound from the seasoning comes out stronger than fresh seasoning. Research by Shadri et al., (2018) regarding the process of powdered lemongrass explained that fresh lemongrass that is dried and then mashed causes a stronger aroma-producing compound of lemongrass.

The texture of beef rendang which contained fresh and dried seasoning had the same average value, 3.40 with the fairly tender textured category. The texture of the beef rendang was tender because the cooking or simmering process used low heat and took a long time. (Fadhila & Darmawati, 2017) explained that the tender texture of the meat is obtained by heating the meat which turns collagen into gelatine at a certain temperature so that the texture of the beef becomes tender. Also, the use of the right type of beef affects the texture of beef rendang. The types of beef used in this process were tenderloin.

The savoury taste of beef rendang is obtained from the use of herbs, spices, coconut milk and salt in the cooking process of meat rendang. The spices and herbs used can enhance the distinctive taste of rendang (Nazir et al., 2018). Besides creating aroma, the use of coconut milk in beef rendang also gives a distinctive taste. According to Prasetio et al., (2014), coconut milk has an important role in processing the food because it can affect the aroma, texture and taste of the food. Furthermore, the use of herbs, spices and coconut milk, the use of salt also produces a savoury taste in beef rendang. As salt functions to neutral and improve the taste of ingredients used in food, giving a little salt to food will make it to become more savoury and tasty (Faridah, Anni, & Pramudia, 2019).

In figure 2, it can be seen that the taste of beef rendang using fresh seasoning is more savoury than

using dried seasoning. The taste of beef rendang which used dry spices is a bit stinging, this is presumably because the dried seasoning was exposed to the sun for an excessive period of time so that it affected its distinctive flavour.

Sebayang & Siahaan, (2018) revealed that the drying process of chilli using sunlight has disadvantages, including changes in colour, texture, taste and it can make the dried ingredient burnt if the drying process is not controlled. This reinforces a notion that long drying process of seasoning (spice or herb) can lead to the change of the taste itself.

Hedonic (preference) is a personal response to something about preference or vice versa. As it is expressing happiness or unpleasant response , it also expresses the level of liking (Agusman, 2013). The hedonic sensory evaluation in figure 2 shows that the hedonic meat rendang (favourite) being favoured by the panellists was beef rendang which was cooked by using fresh seasoning. After attaining the results of the average values from the whole sensory evaluation indicators of the two treatments (beef rendang using fresh seasoning and beef rendang using dried seasoning), then the t-test was carried out.

Table 2 shows that the calculated t count value for all elements is smaller than the t table value. Thus, it can be concluded that the hypothesis which states there is no significant difference between beef rendang using dried seasoning and beef rendang using fresh seasoning is accepted. This is in line with Kusumawardhani et al., (2017) which states that the sensory of rendang produced using dried seasoning is not much different from the sensory of rendang using fresh seasoning.

V. CONCLUSION

Statistically, the results of the treatment showed that there was no significant differences between the sensory evaluation of the beef rendang using fresh seasoning and dried seasoning. However, the physical sensory evaluation of beef rendang in each indicator shows that the best sensory of colour and aroma are found in the beef rendang using dried seasoning. In addition, the texture of the beef rendang cooked by using fresh and dried seasoning was identical in which it had created a quite tender texture. The best sensory of taste is found in beef rendang using fresh seasoning. Meanwhile, the hedonic in both treatments showed that beef rendang using fresh seasoning was preferred by the panellists because the taste of rendang using fresh seasoning tastes is much tastier.

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