



The Addition of *Garciana xanthochymus* on Beef Rendang: The Organoleptic Review

Dikki Zulfikar^{1*}, Rifqi Akmal², and Carmen Martínez-Graciá³

¹Home Economics Study Program, Faculty of Tourism and Hospitality, Universitas Negeri Padang
²Home Economics Study Program, Faculty of Teacher Training and Education, Syiah Kuala University
³Department of Food Science and Nutrition, Faculty of Veterinary, University of Murcia, Spain

*Corresponding author: dikkizulfikar@fpp.unp.ac.id

Abstract. Rendang was a dish consumed regularly by the Minangkabau people and served at special events, becoming well-known worldwide. *Garciana xanthochymus* is a widespread species found in West Sumatra, and previous research has demonstrated its ability to preserve fresh fish. This study examined how adding various amounts of *Garciana xanthochymus* impacts the quality of Rendang, including color, shape, taste, aroma, and texture. This study employed an experimental approach, specifically the organoleptic test, to investigate the impact of varying quantities of *Garciana xanthochymus* (10, 20, 30, 40 grams). The collected data was analyzed using ANOVA with a one-factor wholly randomized design (CRD), consisting of four treatments replicated three times. As a result, there was no significant impact on the shape and aroma of Rendang. However, a significant effect was observed in the taste and color inside the meat, as well as the color and taste of the crust.

Keywords: *Garciana xanthochymus*, organoleptic, quality, rendang.

INTRODUCTION

The Minang people are an ethnic group inhabiting the West Sumatra region. They are renowned for their culinary expertise, and Minang cuisine can be found throughout the archipelago. One popular menu item is Rendang, which boasts rich and spicy flavors, made using locally sourced ingredients and traditional cooking methods passed down through generations (Mardatillah, 2020). It has become very popular not only in the archipelago but worldwide, supported by a survey conducted by Cable News Networking in 2010 and 2017 (Cheung T, 2011).

Rahman (2023) revealed that in ancient times, it was the custom of the Minang people to migrate to various regions in the archipelago and take Rendang with them and savor it at any time without having to take up a lot of time and energy to prepare it. Nurmufida et al. (2017) related that Rendang is a ready-to-eat food that is constantly prepared when someone is on the go and is usually wrapped in banana leaves or paper. Cooked Rendang should have a long shelf life and be cooked without the addition of synthetic preservatives; *Kandis* acid is a sour-tasting fruit with antioxidant, antidiabetic, and antimicrobial properties (Che Hassan et al., 2018). When added to the rendang recipe formulation, it is essential to conduct an organoleptic quality test to obtain the best formulation for the use of *Garciana xanthochymus* in Rendang so that the sour taste from the use of *Garciana xanthochymus* does not significantly change the distinctive taste of Rendang, but is expected to maintain the quality of the rendang shelf life.

Azima & Sayuti (2016) state that Rendang is a dish comprising meat, coconut milk, and a variety of herbs and spices, including red chili, garlic, onion, turmeric, ginger, pepper, lemongrass, galangal, mace, kafir leaves, bay leaves,

turmeric leaves, and *Garcinia xanthochymus*. The dish is traditionally cooked for 6-7 hours at temperatures of 80-95°C. A brown hue and delightful fragrance are created from the combination of ingredients and this cooking process.

Garciana xanthochymus is a spice commonly used in various West Sumatra culinary dishes. Obtained from mature fruit, *Garciana xanthochymus* is split and dried to create the final product. Sumarni & Krispin (2022) revealed that the consumption of *Garciana xanthochymus* enhances the flavor and freshness of food. Additionally, Tursiman & Nofiani (2012) reported that *Garciana xanthochymus* contains antimicrobial secondary metabolites and antioxidants, which effectively inhibit the growth of microbes in food and thus, prolong the shelf life of food products.

This study investigates the impact of *Garciana xanthochymus* processing on the organoleptic quality of beef rendang. The study considers four treatments with different compositions of *Garciana xanthochymus* and beef (10, 20, 30, and 40 grams per 1000 grams of beef). It assesses each product's color, shape, aroma, texture, and taste using three test replicates. The purpose is to determine which formulation significantly affects the organoleptic quality of beef rendang.

METHODS

This study employs an experimental method, using organoleptic tests, to investigate the impact of *Garciana xanthochymus* on beef rendang's organoleptic quality. The criteria evaluated include the beef rendang's color, shape, aroma, texture, and taste. Technical abbreviations are explained upon first use. Rendang products underwent four treatments and were tested by five trained panelists. The descriptive analysis was applied to the data to study the organoleptic characteristics of the four prototype rendang samples.

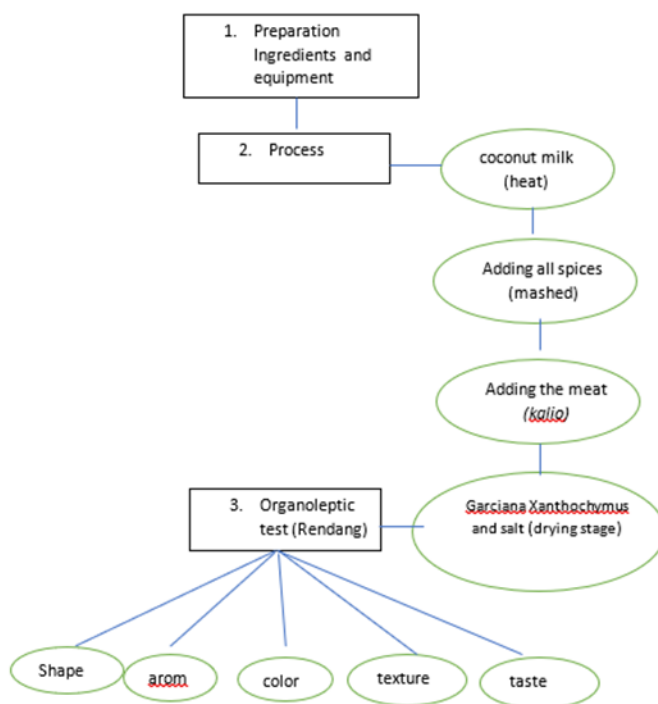


FIGURE 1. Research design

The process for making Rendang with the inclusion of *Garciana xanthochymus* comprises three stages, as seen in **FIGURE 1**. Firstly, in the preparation phase, equipment for making Rendang is categorized as preparation, processing, and presentation. Secondly, the procedure commences by heating the coconut milk and adding mashed and unrefined spices. This is achieved by boiling and continuously stirring to avoid coconut milk separation, locally known as *mengunyai*. This process results in the formation of *kalio* form and the thickening of coconut milk, omitting the oil. Next, the meat is added to the *kalio* coconut milk. This process is repeated until the coconut milk shrinks and dries up, resulting in tender beef. When the Rendang has reached the drying stage, *Garciana xanthochymus* and salt should

be added. Once the coconut milk has completely dried up and the meat is soft, the Rendang is ready to be served. Then, the third stage is carried out with an organoleptic test. Please refer to **TABLE 1** for a detailed description of the processing stages.

TABLE 1. Research design

Material	Control	Treatment			
		A(10gr)	B(20gr)	C(30gr)	D(40gr)
Beef	1000 gr	1000 gr	1000 gr	1000 gr	1000 gr
Coconut milk	2500 ml	2500 ml	2500 ml	2500 ml	2500 ml
Red Chili	250 gr	250 gr	250 gr	250 gr	250 gr
Garlic	100 gr	100 gr	100 gr	100 gr	100 gr
Shallots	150 gr	150 gr	150 gr	150 gr	150 gr
Ginger	20 gr	20 gr	20 gr	20 gr	20 gr
Galangal	100 gr	100 gr	100 gr	100 gr	100 gr
Turmeric leaves	1 Sheet	1 Sheet	1 Sheet	1 Sheet	1 Sheet
Bay leaves	1 Sheet	1 Sheet	1 Sheet	1 Sheet	1 Sheet
Kafir leaves	3 Sheets	3 Sheets	3 Sheets	3 Sheets	3 Sheets
Lemon grass	1 stick	1 stick	1 stick	1 stick	1 stick
Salt	1 tsp	1 tsp	1 tsp	1 tsp	1 tsp
<i>Garciana xanthochymus</i>	-	10 gr	20gr	30gr	40gr

RESULTS AND DISCUSSION

The result shows that the tradition of using *Garciana xanthochymus* for beef rendang does not significantly affect the dish's shape or aroma. It can be seen in **FIGURE 2**. The shape of the beef in Rendang is influenced by the cutting technique and not by the type of meat or other ingredients, as shown by Aliah and Elida's (2022) research. The aroma of beef rendang is derived from the herbs and spices used. The herbs and spices utilized in cooking have volatile compounds that generate appetizing aromas (Linda, 2022). This finding supports Martínez-Graciá et al., (2015) research, which suggests that the use of herbs and spices in the processing of meat rendang enhances the sensory qualities of food, such as its aroma and nutritional value.

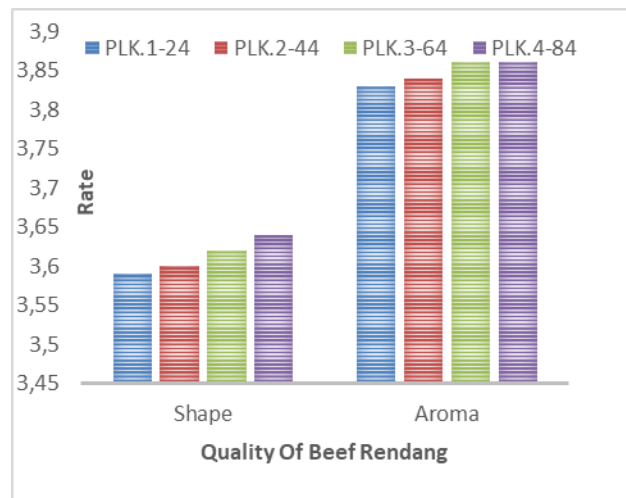


FIGURE 2. Descriptive test of shape and aroma quality beef rendang using *Garcinia xanthochymus*.

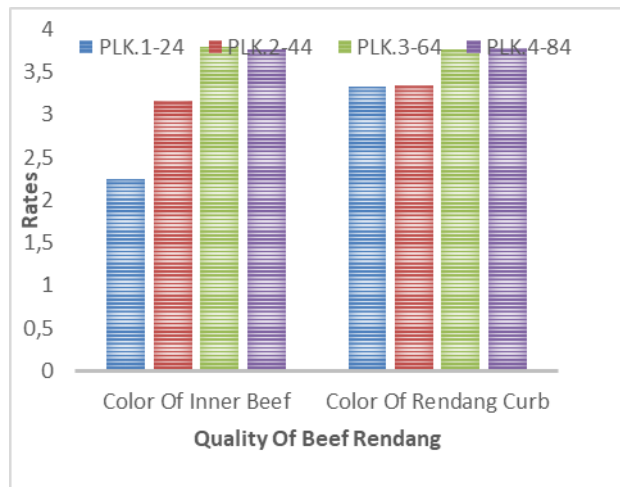


FIGURE 3. Descriptive test of color quality beef rendang using *Garciana xanthochymus*.

For color quality, convection from the inner beef and the crumbs (as described in **FIGURE 3**) has been examined. According to Duncan's test, adding *Garcinia Xanthochymus* to beef Rendang has demonstrated the best results in Treatment 3-64 (30g) with a recorded value of 3.8. Moreover, Treatment 4-84 (40g) produced a value of 3.77, and Treatment 2-64 (20g) obtained a value of 3.16. Conversely, Treatment 1-24 (10g) displayed a value of only 2.25.

Adding color to food plays a role in its external appearance and makes it interactive. This is evident in the color of the inner meat in Rendang, which should ideally be light brown. However, the desirable color of a good beef Rendang is dark brown, according to the research conducted by Animi (2021). The study's findings proved that adding *Garcinia Xanthochymus* to beef Rendang significantly enhances Treatment 3-64 (30g) with a score of 3.8, as per the Duncan test.

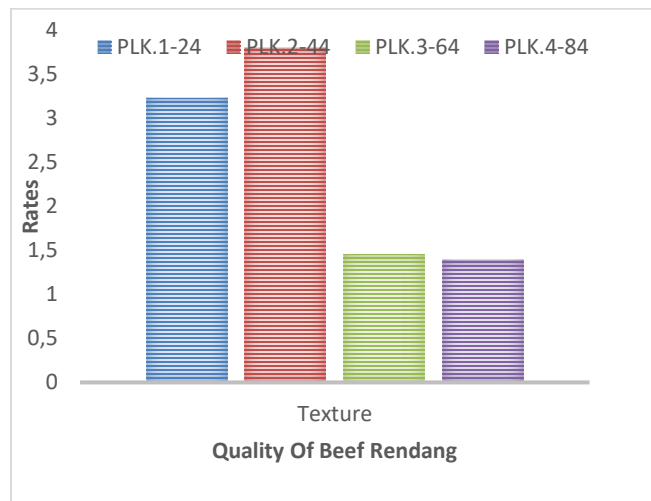


FIGURE 4. Descriptive test of textur quality beef rendang using *Garciana xanthochymus*.

Including *Garcia thyme* in beef rendang notably impacts the dish's texture, as illustrated in Figure 4. The convection results from treatment 2-44 (20 g) had a test value 3.8. Similarly, treatment 1-24 (10 g) had a test value of 3.23, and treatment 3-64 (30 g) resulted in a test value of 2. In addition, treatment 4-84 (40 g) recorded a series of values at 1.45.

Sari & Yohana (2015) noted that food texture results from physical contact with the tongue and affects the evaluation of food. The texture of food relates to its softness, roughness, crunchiness, chewiness, wiriness, ruggedness, and smoothness. The most favorable outcome was treatment 2-44 (20g) with a test value of 3.8 in the soft category,

as Ikrar and Faridah (2021) reported. It was observed that a higher quantity of *Garciana thymus* added to the beef rendang resulted in a stricter texture quality, according to Patriani & Wahyuni (2020). Drip loss refers to the loss of essential nutrients from the meat, which occurs with the release of meat juices during cooking. Using more *Garciana xanthochymus* results in a higher rate of drip loss.

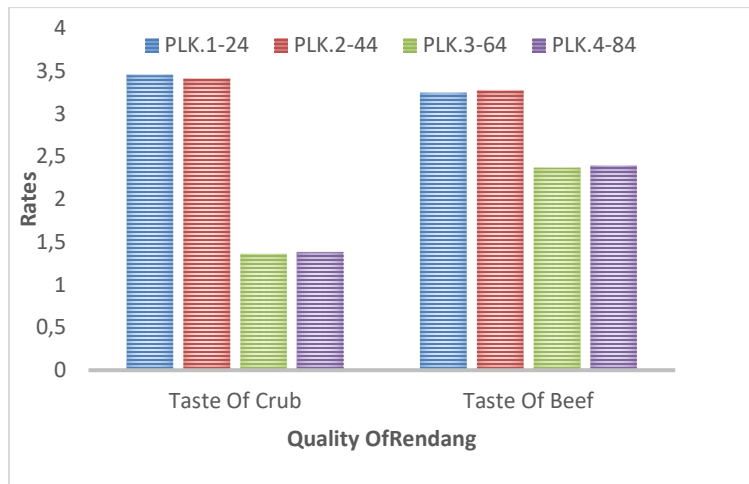


FIGURE 5. Descriptive test of taste quality beef rendang using *Garciana xanthochymus*.

The impact of adding *Garciana Xanthochymus* to beef Rendang is considerable regarding taste in rendang crumbs, as illustrated in Figure 5. Treatment 1-24 (10g) receives a score of 3.45, treatment 2-44 (20g) achieves a score of 3.41, and treatment 4-84 (40g) records a score of 1.38. Additionally, treatment 3-64 (30g) yields a test score 1.36. The features of the rendang crumb that closely resemble the rendang crumb are observed in samples coded 1-24, which were treated with 10 grams of *Garciana xanthochymus* per 1000 grams of beef. The organoleptic test results of beef rendang prepared with *Garciana xanthochymus* in the seasoning reveal that the inclusion of *Garciana xanthochymus* has a distinct impact on the organoleptic properties of beef rendang. Hence, in beef rendang preparation, the selection and incorporation of *Garciana xanthochymus* in the seasoning results in a savory flavor. Based on the research results of Nadia et al. (2004), it has been revealed that savory is a combination of ingredients that includes salts, free amino acids, oligopeptides, nucleotide compounds, mano, and oligosaccharides, as well as organic acids, some of which are food ingredients. Contains acids such as citrus, vinegar, *Garcinia atroviridis*, and *Garciana xanthochymus*.

CONCLUSION

Based on the organoleptic test, it is evident that the addition of *Garciana xanthochymus* significantly impacted the color, texture, and taste of the beef rendang, according to the panelists' evaluations. The aroma and shape, however, remained unaffected. The most effective treatment, as observed by the panelists in terms of taste, color, texture, shape, and aroma, was the one containing 20 gr *Garciana xanthochymus*.

The sour taste attributes of *Garciana xanthochymus* possess antioxidant, antidiabetic, and antimicrobial properties. This makes it a suitable ingredient to be added to Rendang, extending its shelf life with a threshold limit of 20 grams without impacting the taste, color, or texture.

REFERENCES

1. Aliah, M., & Elida, E. (2022). Analysis Of The Difference In The Quality Of Beef Randang With The Use Of Local Beef And Imported Beef. *Jurnal Pendidikan Tata Boga dan Teknologi*, 3(1), 82-87.
2. Animi, N. (2021). 2.A_1_NISMAR_AMINI_16075027_5134_2021. Repository UNP. <http://repository.unp.ac.id/id/eprint/37941>

3. Che Hassan, N. K. N., Taher, M., & Susanti, D. (2018). Phytochemical constituents and pharmacological properties of *Garcinia xanthochymus*- a review. *Biomedicine & Pharmacotherapy= Biomedecine & Pharmacotherapie*, 106, 1378-1389.
4. Cheung T. (2011). 4.50-lekkerste-wereldgerechten-II (1). <https://mamameteenblog.nl/wp-content/uploads/2016/06/50-lekkerste-wereldgerechten-II.docx>
5. Ikrar, S. W., & Faridah, A. (2021). Standardization of the recipe for rendang daging in Nagari Lingkuang Aua Kecamatan Pasaman Kabupaten Pasaman Barat. *Jurnal Pendidikan Tata Boga dan Teknologi*, 2(1), 70-75.
6. Linda, M. (2022). *Studi etnobotani jenis rempah pada bumbu masakan padang khas Minangkabau di Kecamatan Tanjung Karang Pusat Bandar Lampung* (Doctoral dissertation, UIN RADEN INTAN LAMPUNG).
7. Mardatillah, A. (2020). The enterprise culture heritage of Minangkabau cuisine, West Sumatra of Indonesia as a source of sustainable competitive advantage. *Journal of Ethnic Foods*, 7(1), 34.
8. Martínez-Graciá, C., González-Bermúdez, C. A., Cabellero-Valcárcel, A. M., Santaella-Pascual, M., & Frontela-Saseta, C. (2015). Use of herbs and spices for food preservation: Advantages and limitations. *Current opinion in food science*, 6, 38-43.
9. Nadia, L., Apriyantono, A., & Rahayu, W. P. (2004). Karakterisasi rasa gurih pada beberapa produk pangan. *Jurnal Matematika Sains dan Teknologi*, 5(2), 97-106.
10. Nurmufida, M., Wangrimen, G. H., Reinalta, R., & Leonardi, K. (2017). Rendang: the treasure of minangkabau. *Journal of Ethnic Foods*, 4(4), 232-235.
11. Patriani, P., & Wahyuni, T. H. (2019). Physical and organoleptic quality of culled layers chicken meat using marinated asam kandis fruits (*Garcinia dioica* Blume). *Indonesian Journal of Agricultural Research*, 2(3), 188-195.
12. Rahman, F. (2023). *Jejak rasa nusantara: sejarah makanan Indonesia*. Gramedia Pustaka Utama.
13. Azima, F., & Sayuti, K. (2016). The evaluation of nutritional value of Rendang Minangkabau. *Agriculture and Agricultural Science Procedia*, 9, 335-341.
14. Sari, K. I., & Yohana, W. (2015). Tekstur makanan: sebuah bagian dari food properties yang terlupakan dalam memelihara fungsi kognisi?. *Makassar Dental Journal*, 4(6).
15. Sumarni, S., & Krispin, C. (2022). Inventarisasi tumbuhan sebagai penyedap rasa alami di kawasan hutan desa ensaid panjang kabupaten sintang. *Jurnal Agroteknosains*, 6(2), 96-103.
16. Tursiman, P. A., & Nofiani, R. (2012). Total fenol fraksi etil asetat dari buah asam kandis (*Garcinia dioica* Blume). *Jurnal Kimia Khatulistiwa*, 1(1).