Content lists available at PublikasiPolije

International Journal of Technology, Food and Agriculture (TEFA)

journal homepage : https://publikasi.polije.ac.id/index.php/tefa

Article

The Sensory Evaluation of Traditional Indonesian Braised Broiler Thigh Meat '*Ungkep*' With Different Concentrations of Indigenous Herbs and Spices

Budi Prasetyo[1], Agus Hadi Prayitno[2]*, Dharwin Siswantoro[3], Dewi Asri[4], Yoga Dwi Kurnia Putra[5], Melda Nur Agustin[6], and Faradziba Rahayu Sifa' Iftitah Ramadhanti[7]

[1] Department of Animal Science, Politeknik Negeri Jember; budi_prasetyo@polije.ac.id
[2] Department of Animal Science, Politeknik Negeri Jember; agushp@polije.ac.id
[3] Department of Animal Science, Politeknik Negeri Jember; dharwin_siswantoro@polije.ac.id
[4] Department of Animal Science, Politeknik Negeri Jember; dadewi2707@gmail.com
[5] Department of Animal Science, Politeknik Negeri Jember; yogadwikurniaputra@gmail.com
[6] Department of Animal Science, Politeknik Negeri Jember; meldanuragustin29@gmail.com
[7] Department of Animal Science, Politeknik Negeri Jember; faradzibarahayu@gmail.com
* Correspondence: agushp@polije.ac.id; Tel.: +628568669898

Abstract: This study aimed to explore the impact of varying concentrations of indigenous herbs and spices on the sensory evaluation of braised broiler thigh meat "*ayam ungkep*". The research materials included broiler thigh meat, garlic, shallots, turmeric, ginger, candlenut, sugar, galangal, coriander, salt, palm oil, and monosodium glutamate. The treatment concentrations for broiler thigh meat were set at 20%, 25%, and 30% of the meat's weight. A hedonic test of cooked broiler thigh meat was performed as part of the sensory evaluation by 40 panelists who were not instructed. The hedonic test evaluated color, flavor, texture, tenderness, juiciness, and overall acceptability among other parameters. The non-parametric Hedonic Kruskal-Wallis test was used to assess the sensory evaluation data. After determining whether there was a significant difference ($P<0.05$), Duncan's New Multiple Range Test was performed. The findings showed that the color, flavor, texture, tenderness, juiciness, and overall acceptability of braised broiler thigh meat were not significantly affected by different levels of indigenous herbs and spices. For more effective produce of the still-preferred traditional Indonesian braised chicken meat products, it was suggested that the concentration of indigenous herbs and spices in broiler meat processing remain at 20% because, with this concentration, the panellists still like the resulting braised chicken.

Keywords: broiler chicken; braised; sensory evaluation

Citation: B. Prasetyo, A.H. Prayitno, D. Siswantoro, D. Asri, Y.D.K. Putra, M.N. Agustin, F.R.S.I. Ramadhanti "The Sensory Evaluation of Traditional Indonesian Braised Broiler Thigh Meat 'Ungkep' With Different Concentrations of Indigenous Herbs and Spices", *TEFA*, vol. 1, no. 2, pp. 72–77, Apr. 2024.

Received: 14-01-2024
Accepted: 28-04-2024
Published: 28-04-2024

1. Introduction

Broiler chicken meat contains high protein, the price is relatively cheaper, and the texture is fibrous [1]. This protein source is continuously being transformed into ready-to-cook (RTC) products. Various products can be derived from broiler chicken meat [2] to enhance shelf life and economic value without compromising nutritional content [3]–[9]. One such sought-after RTC product in Indonesia is braised chicken (*ayam ungkep*). The demand for ready-to-cook products has surged during the Covid-19 pandemic due to activity restrictions, providing a convenient option for meal preparation. *Ayam ungkep* is chicken meat that is boiled in a little water and added with spices so that the taste of the chicken becomes more savory and delicious [10].

The braising technique, which is a cooking technique over low heat, makes the taste of the food strong and delicious [11]. *Ungkep* is the Javanese language which means cooking ingredients with spices over low heat for a longer time. The braising technique as a typical Indonesian cooking culture has been practiced for a long time. Chicken meat is

not only marinated with spices and left for a long time but goes through a cooking process so that the spices easily release enzymes that can give off a distinctive aroma and taste [12]. Herbs and spices such as shallots, garlic, turmeric, candlenuts, ginger, galangal, sugar, coriander, salt, and palm oil have been widely used as seasonings for braised chicken. Until now, there has been no assessment of applying the steaming method with herbs and spices to broiler thigh meat. Thigh meat is particularly favored by certain consumers [13]. Panelists' preferences for processed meat products are frequently evaluated using the hedonic test [14]. The novelty of this research lies in evaluating the sensory attributes of a traditional Indonesian chicken braised made with broiler thigh meat and incorporating various concentrations of indigenous herbs and spices. Hence, the purpose of this study is to determine how different concentrations of indigenous herbs and spices impact the way that braised broiler thigh meat (*ayam ungkep*) is evaluated by the sensory evaluation.

2. Materials and Methods

2.1. Materials

The study utilized broiler thigh meat, along with ingredients such as garlic, shallots, turmeric, ginger, sugar, galangal, coriander, salt, monosodium glutamate (MSG), and palm oil.

2.2. Methods

This study commences with the preparation of indigenous herbs and spices, followed by the preparation of broiler thigh meat, the braising process, the cooking procedure, and concludes with hedonic testing [15].

2.2.1. Preparation of broiler thigh meat

The thigh meat from broiler chickens utilized in this investigation was sourced from indigenous farms located in Jember.

2.2.2. Preparation of indigenous herbs and spices

The combination of indigenous herbs and spices incorporated in the preparation of braised chicken meat consists of: 15% shallots, 15% garlic, 11% turmeric, 6% candlenut, 1% ginger, 1% galangal, 1% coriander, 5% sugar, 8% salt, 12% MSG, and 25% palm oil.

2.2.3. Braised process

Broiler chicken thigh meat is braised with different concentrations of indigenous herbs and spices, namely: 20, 25, and 30% of the total meat weight. Herbs and spices are mashed and then sautéed in palm oil. Water is added in a ratio of 1:1 (v/w) to broiler chicken meat. Broiler chicken thigh meat is put into the herbs and spices and mixed until evenly distributed. Broiler chicken meat is braised at 65°C for 60 minutes. Following the braising of the chicken meat, it is subsequently allowed to cool to room temperature.

2.2.4. Cooking process

The broiler thigh meat having undergone the braising process is steamed for a duration of 45 minutes. Subsequent to the cooking, the broiler chicken meat is permitted to cool before undergoing sensory evaluation conducted by untrained panelists.

2.3 Hedonic Test

Broiler thigh meat, which had been subjected to varying concentrations of herbs and spices during the braising process, underwent hedonic evaluation by a panel of 40 untrained assessors [16]. The evaluated factors encompassed color, flavor, taste, texture, juiciness, tenderness, and overall acceptability [14]. The assessment was conducted using a hedonic scale ranging from 1 (dislike extremely) to 5 (like extremely).

2.4 Statistic Analysis

The Hedonic Kruskal-Wallis test was used to perform non-parametric analysis on the data from the sensory evaluation results. Duncan's New Multiple Range Test was used for additional testing if there was a significant difference (P<0.05) [17].

3. Results and Discussion

Conducting a hedonic test for sensory evaluation is a quality parameter for processed meat products aiming to ascertain the preferences of the panelists [8]. The outcomes of the sensory evaluation test performed through the hedonic test by the panelists on braised broiler thigh meat with varied concentrations of indigenous herbs and spices, are outlined in Table 1. Table 1 explains the results of the sensory evaluation for each variable such as color, aroma, taste, texture, tenderness, juiciness, and acceptability of broiler thigh meat braised with a concentration of local herbs and spices of 20%, 25%, and 30%, respectively.

Table 1. Sensory evaluation results on broiler thigh meat braised "*ayam ungkep*" with different concentrations of indigenous herbs and spices.

Variable	Concentration of herbs and spices		
	20%	25%	30%
Color^{ns}	3.25	3.18	3.15
Flavor^{ns}	3.43	3.30	3.40
Taste^{ns}	3.68	3.48	3.55
Texture^{ns}	3.75	3.63	3.73
Tenderness^{ns}	3.63	3.35	3.35
Juiceness^{ns}	3.68	3.60	3.68
Acceptability^{ns}	3.83	3.65	3.58

^{ns}Non-significant (P>0.05)

3.1. Color

Changing the amounts of indigenous herbs and spices during braising broiler thigh meat did not significantly affect the color of the chicken meat (P>0.05), according to the results. The color score for the braised broiler thigh meat ranged from 3.15 to 3.25, meaning it was rather like to like. The degree to which the panelists preferred the color of broiler thigh meat braised in various proportions of indigenous herbs and spices remained unchanged. This may be because the panelists had difficulty visually identifying the color of the broiler thigh meat that had been braised with varying amounts of indigenous herbs and spices. The panelist's choice of processed foods and meat may have an impact on how they perceive the color of the meat [18]. In order to ensure that the evaluation of the broiler thigh meat braised color scores are not significantly different for each treatment, panelists are believed to have the same visual perception of all the colors of the meat braised with varying concentrations of indigenous herbs and spices.

3.2. Flavor

The flavor of broiler thigh meat was not significantly affected (P>0.05) by the concentration of indigenous herbs and spices when the broiler thigh meat was braised, according to the findings. From rather like to like, the flavor score for the braised broiler thigh meat varied from 3.30 to 3.43. There was no change in the panelists' degree of preference for the flavor of broiler thigh meat braised with varying amounts of indigenous herbs and spices. This may be the result of the panelists' inability to detect flavor differences in broiler thigh meat braised with varying amounts of indigenous herbs and spices based only on scent. A variety of ingredients that activate olfactory receptors in the nasal passages combine to produce the flavor of meat [19]. However, panelists believe that flavor-forming compounds from herbs and spices used as seasonings for broiler thigh

meat braised at varying concentrations smell nearly the same. The panelists' evaluations of the braised flavor of broiler thigh meat showed minimal variation between treatments based on these impressions.

3.3. Taste

Taste, a sensory attribute associated with the sense of taste [14], was examined in relation to broiler thigh meat braised with varying concentrations of indigenous herbs and spices. The findings revealed that the taste of broiler thigh meat was not significantly affected ($P>0.05$) by the different indigenous herb and spice concentrations. Taste ratings for the meat from braised broiler thigh meat varied from 3.48 to 3.68, representing preferences that fell between "rather like" and "like." The participants' preferences for the flavor of broiler thigh meat braised in various amounts of indigenous herbs and spices did not change. This may be attributed to the challenge faced by panelists in discerning taste differences in broiler thigh meat braised with various indigenous herb and spice concentrations based on how they are perceived. A variety of substances that activate tongue taste receptors combine to produce the flavor of meat [20]. The panelists feel that some flavoring compounds from indigenous herbs and spices, utilized at varying concentration levels as seasonings for broiler thigh meat, provide flavors that are almost exactly alike. Consequently, the panelists' assessments of the taste scores for braised broiler thigh meat did not show significant variation across each treatment.

3.4. Texture

Texture, an attribute associated with the perceived smoothness during meat chewing [14], was examined in relation to broiler thigh meat braised with varying concentrations of indigenous herbs and spices. The study's findings show that the texture of the broiler thigh meat was not significantly affected ($P>0.05$) by the various concentrations of indigenous herbs and spices employed in the braising process. The meat from braised broiler thigh meat received texture scores ranging from 3.63 to 3.75, which represent preferences between "rather like" and "like." The preference of the panelists for the texture of broiler thigh meat braised with varying amounts of indigenous herbs and spices did not change. The panelists struggled to discern the changes in texture between braised broiler thigh meat that was spiced with different proportions of indigenous herbs and spices. The panelists' likely perceived the meat in the thigh, known for its smoothness, to feel fairly similar [21]. Consequently, the panelists' evaluations of the texture scores for the braised broiler thigh meat did not show substantial differences across the various treatments.

3.5. Tenderness

Tenderness, a critical sensory attribute for assessing meat quality based on ease of chewing [14], , was investigated in the context of broiler thigh meat braised with varying concentrations of indigenous herbs and spices. The results showed that the tenderness of the broiler thigh meat was not significantly affected ($P>0.05$) by varying the concentration levels of indigenous herbs and spices during the braising process. The meat from broiler thighs that were braised received tenderness scores ranging from 3.60 to 3.68, representing preferences between "rather like" and "like." The broiler thigh meat tenderness that the panelists preferred to see was maintained even when the amount of indigenous herbs and spices used in the braising varied. This may be attributed to the challenge faced by panelists in distinguishing the tenderness of broiler thigh meat braised with varying concentrations of indigenous herbs and spices during the act of biting into the meat. Allegedly, the panelists had a nearly identical perception of the tenderness of the meat used, particularly the thigh known for its tenderness [13]. Consequently, the panelists' evaluations of the tenderness scores for braised broiler thigh meat did not exhibit significant differences across the various treatments.

3.6. Juiciness

Juiciness, a sensory attribute associated with the moisture content of meat [14], was examined in the context of broiler thigh meat braised with varying concentrations of indigenous herbs and spices. The findings indicated that modifying the concentrations of indigenous herbs and spices during the braising of broiler thigh meat did not result in a significant effect ($P>0.05$) on the juiciness of the meat. The juiciness scores of braised broiler thigh meat varied from 3.35 to 3.63, indicating preferences ranging from "rather like" and "like." The panelists consistently maintained their preferences for the level of juiciness in broiler thigh meat, even when braised with varying amounts of indigenous herbs and spices. This might be attributed to the challenge faced by panelists in discerning the level of juiciness in broiler thigh meat braised with varying concentrations of indigenous herbs and spices during the process of chewing. Allegedly, the panelists had a nearly identical perception of the moisture level in braised broiler thigh meat. The panelists' evaluations of the juiciness scores for the braised broiler thigh meat did not show any appreciable variations among the different treatments based on this perception.

3.7. Acceptability

Acceptability constitutes a component of the meat's sensory properties, reflecting the panelists' overall endorsement of all the sensory attributes tested [14]. The results showed that braising broiler thigh meat in various proportions of indigenous herbs and spices had no discernible impact ($P>0.05$) on the meat's acceptability. The braised broiler thigh meat had acceptance values ranging from 3.58 to 3.83, which represent preferences ranging from "rather like" to "like." The panelists' preferences remained unaltered on the acceptability of broiler thigh meat cooked in various amounts of indigenous herbs and spices. This lack of change could be attributed to the panelists' difficulty in discerning the sensory quality of broiler thigh meat braised with different concentrations of indigenous spices and herbs. Consequently, based on the outcomes of this study, it is recommended that, in the braising process of broiler meat, a concentration of indigenous herbs and spices up to 20% can be employed to enhance efficiency in producing braised chicken meat products that continue to be favored. Even with a 20% concentration from the study's results, the panelists still enjoyed the braised chicken.

4. Conclusions

The results indicated that varying concentrations of indigenous herbs and spices used in braising broiler thigh meat had no discernible impact on its color, flavor, taste, texture, tenderness, juiciness, and overall acceptability. It is recommended that the use of indigenous herbs and spices in the processing of broiler thigh meat be maintained at a concentration of 20% to enhance the efficiency in producing braised meat products that continue to meet consumer preferences.

Acknowledgments: The author extends heartfelt gratitude to the Pusat Penelitian dan Pengabdian Kepada Masyarakat (P3M) of Politeknik Negeri Jember for their generous support in providing research funding through the PNPB 2023 program, enabling the successful execution of this research.

Conflicts of Interest: The authors declare no conflict of interest.

References

[1] Nuraini *et al.*, "Feed Consumption, Average Daily Gain and Feed Conversion of Broiler Chicken with Different Feed," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 465, no. 012047, pp. 1–4, 2020, doi: 10.1088/1755-1315/465/1/012047.

[2] S. Barbut and E. M. Leishman, "Quality and Processability of Modern Poultry Meat," *Animals*, vol. 12, no. 20, pp. 1–17, 2022, doi: 10.3390/ani12202766.

[3] A. H. Prayitno, T. H. Rahman, S. W. Wibisono, and A. R. Rahmi, "Effect of edamame flour filler substitution on the nutrition facts of culled duck meatballs," in *International Seminar on Livestock Production and Veterinary Technology*, Bogor: Badan Penelitian dan Pengembangan Pertanian, 2021, pp. 453–459. doi: http://dx.doi.org/10.14334/Proc.Intsem.LPVT-2021-p.42.

[4] H. Oktafa, A. H. Prayitno, H. T. Handayani, and D. L. Rukmi, "The effect of marinade concentrations of different local herbs and spices on the hedonic test of super native chicken breast," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 980, no. 1, p. 012015, 2022, doi: 10.1088/1755-1315/980/1/012015.

[5] A. H. Prayitno, D. L. Rukmi, A. Widiyawati, and B. Prasetyo, "The fortification effect of duck eggshell nano-calcium on the physical quality of beef sausage," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 980, no. 1, p. 012016, 2022, doi: 10.1088/1755-1315/980/1/012016.

[6] R. O. Sujarwanta, Jamhari1, E. Suryanto, R. Yuliatmo, and A. H. Prayitno, "Physicochemical and sensory characteristics of chicken nugget with curcuma (Curcuma zanthorrhiza) flour fortification," *IOP Conf. Ser. Earth Enveronmental Sci.*, vol. 387, pp. 1–5, 2019, doi: 10.1088/1755-1315/387/1/012091.

[7] A. H. Prayitno, F. Lorenza, Suparmi, and M. H. Naafi'yan, "Quality of chicken sausage fortified with nano-calcium duck eggshell in different vacuum packaging during storage at -18◎C," *J. Ilmu Ternak dan Vet.*, vol. 26, no. 4, pp. 152–157, 2021.

[8] B. Prasetyo and A. H. Prayitno, "The sensory characteristics of fortified beef sausage with duck eggshell nano-calcium," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 672, no. 1, p. 012042, 2021, doi: 10.1088/1755-1315/672/1/012042.

[9] A. H. Prayitno, B. Prasetyo, and A. Sutirtoadi, "Synthesis and characteristics of nano calcium oxide from duck eggshells by precipitation method," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 411, no. 1, p. 012033, 2020.

[10] M. Laut, "Braised chicken Indonesian translation : ayam ungkep," *www.proz.com*, 2012. https://www.proz.com/kudoz/english-to-indonesian/cooking-culinary/4943897-braised-chicken.html (accessed Feb. 26, 2022).

[11] W. Joestiarto, "Ungkep Mengungkep," *www.republika.co.id*, 2015. https://republika.co.id/amp/nyxwlg1 (accessed Feb. 26, 2022).

[12] Siswanti, R. B. K. Anandito, and D. R. Affandi, "IbM industri rumah tangga ayam ungkep di Gembongan, Kecamatan Kartasura, Kabupaten Sukoharjo," *PRIMA J. Community Empower. Serv.*, vol. 2, no. 1, pp. 15–20, 2018.

[13] H. Resnawati, "Karakteristik karkas dan preferensi konsumen terhadap daging dada ayam yang diberi ransum mengandung cacing tanah (Lumbricus rubellus)," in *Prosiding Seminar Nasional Teknologi Inovatif Pascapanen untuk Pengembangan Industri Berbasisi Pertanian*, Bogor: Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, 2005, pp. 424–431.

[14] A. H. Prayitno, E. Suryanto, and Zuprizal, "Kualitas fisik dan sensoris daging ayam broiler yang diberi pakan dengan penambahan ampas virgin coconut oil (VCO)," *Bul. Peternak.*, vol. 34, no. 1, pp. 55–63, Feb. 2010.

[15] B. Prasetyo, A. H. Prayitno, and D. Siswantoro, "Ayam Lokal Ungkep dengan Penambahan Nano Kalsium Laktat Kerabang Telur," P00202214379, 2022

[16] S. K. Devatkal, B. M. Naveena, and T. Kotaiah, "Quality, composition, and consumer evaluation of meat from slow-growing broilers relative to commercial broilers," *Poult. Sci.*, vol. 98, no. 11, pp. 6177–6186, 2019, doi: 10.3382/ps/pez344.

[17] H. Oktafa, A. H. Prayitno, and H. T. Handayani, "Quality of Physical and Sensory of Super-native Chicken Breast Marinated with Herbs and Spices with Different Levels of Marination Concentration," *J. Ilmu Ternak dan Vet.*, vol. 28, no. 1, pp. 76–85, 2023, doi: 10.14334/jitv.v28i1.3092.

[18] B. A. Altmann, A. Trinks, and D. Mörlein, "Consumer preferences for the color of unprocessed animal foods," *J. Food Sci.*, vol. 88, no. 3, pp. 909–925, 2023, doi: 10.1111/1750-3841.16485.

[19] C. R. Kerth and R. K. Miller, "Beef flavor: A review from chemistry to consumer," *J. Sci. Food Agric.*, vol. 95, no. 14, pp. 2783–2798, 2015, doi: 10.1002/jsfa.7204.

[20] D. Dashdorj, T. Amna, and I. Hwang, "Influence of specific taste-active components on meat flavor as affected by intrinsic and extrinsic factors: an overview," *Eur. Food Res. Technol.*, vol. 241, no. 2, pp. 157–171, 2015, doi: 10.1007/s00217-015-2449-3.

[21] X. Averós and I. Estevez, "Meta-analysis of the effects of intensive rearing environments on the performance and welfare of broiler chickens," *Poult. Sci.*, vol. 97, no. 11, pp. 3767–3785, 2018, doi: 10.3382/ps/pey243.