

Sensory characteristics of *bungong kayee* (traditional Acehese cake) as a local food enrichment

Sri Maryati^{1*}, Nanda Triandita¹, Lia Angraeni¹, and Mirza Anggriawin¹

¹Teuku Umar University, Department of Agricultural Product Technology, Faculty of Agriculture, Meulaboh, West Aceh Regency, Indonesia

Abstract. Bungong kayee is a traditional Acehese cake which has a distinctive shape like leaves arranged to form a flower with a crunchy texture, has a white bone color to pale yellow. This color is obtained from the cooking process with oil using low heat so that it has a color almost the same as the cork egg cake. This study aims to determine the level of panelists' preferences for Acehese traditional cakes in terms of sensory assessment in increasing the added value of local food. The sample used in this study is bungong kayee. Sample testing was carried out 3 times with different production times. The interval between production for sample testing is 1 week. The difference in production time is used to see the stability of the preference of the panelists for the sensory test of bungong kayee which remains the same or constant. Sensory evaluation used the hedonic scale 5 method with 35 panelists aged between 20-23 years from Teuku Umar University students, for the 3 test parameters were color, taste and texture. In the three productions the color values ranged from 4.40 to 4.51 (likes) while the hedonic test color values ranged from 5.11 to 4.29 (likes) from the three productions. And the hedonic texture test scores range from 4.26 to 4.69 (rather like). Based on the sensory test, the three test parameters namely color, taste and texture, overall the panelists preferred the bungong kayee cake in the third production compared to the first and second productions.

1 Introduction

Bungong kayee is one of Aceh's traditional cakes which is still popular today. This cake is unique, such as the leaves which are arranged to form flowers with a crunchy texture and are included in the biscuit category. Bungong kayee has white to pale yellow to bright bones. This color is obtained from the process of cooking with oil using low heat, so it has a color that is almost the same as the cork egg cake. Bungong kayee is coated with liquid sugar until a thin layer forms on top as a garnish. It also functions as a flavor enhancer for the bungong kayee cake because the basic dough does not use sugar at all.

* Corresponding author: srimaryati@utu.ac.id

Bungong Kayee cake is made from the main ingredients of glutinous rice flour, starch, eggs and sugar. In the past, this cake was only served as Eid cakes and traditional ceremonies held by the people of Aceh. But now Bungong Kayee is starting to be consumed as a daily snack, although it is not as popular as other traditional Acehese cakes. Bungong kayee was chosen as a daily snack because it is suitable as a side dish for coffee and tea drinks. In addition, in the process of making this cake does not use synthetic food additives, so it becomes an alternative snack because it is healthier.

The existence of a fairly high interest in the consumption of traditional Aceh cakes as daily snacks is quite encouraging because indirectly one of the Acehese cultures is still well preserved. To find out the level of consumer interest in a food product, it can be seen through the panelist preferences using sensory tests. Sensory characteristics of food are critical to consumer food choice and acceptability [1-3][Click or tap here to enter text..](#)

In contrast to other traditional Aceh cakes, a lot of research has been done on sensory cakes [4-8]. There are no research reports regarding sensory analysis of bungong kayee cakes for color, taste and texture, so that they can be used as a reference for future research on bungong kayee products. Based on the explanation above, this research was conducted to evaluate the evaluation of Bungong Kayee cake as one of Aceh's traditional cakes in local enrichment as a healthy snack and is liked by the community.

2 Materials and methods

2.1 Materials and tools

Materials used in this study were Aceh Traditional Cake, namely *bungong kayee*, and mineral water. While the equipment used in this study were stationery, plastic clips as wrapping test samples, and napkins.

2.2 Research methods

The sample of *bungong kayee* cakes were purchased from a traditional Acehese cake producers, namely Abanasel Stores located in Langung, Meureubo District, West Aceh Regency. Sampling was carried out 3 times based on the production time interval. The inter-production interval for sample testing is one week. The difference in production time were used to understand the stability of sensory characteristics of Aceh's traditional cakes whether they remain the same or constant.

Observation parameters used in this study were sensory evaluation, Definitions for selected attributes were developed with reference to literature [9]. Sensory tests were carried out on 3 (three) parameters, namely flavor, color and texture. The panelists used were untrained panelists from students of Agricultural Product Technology study program, Faculty of Agriculture, Teuku Umar University, as many as 35 panelists aged 20-24 years old. The hedonic scale for sensory use were a scale of 5: (1) strongly dislike, (2) dislike, (3) slightly like, (4) like, (5) like very much.

2.3 Data analysis

The data were analyzed in ANOVA using the SPSS 22 program. Followed by Duncan's further test when significant difference in the 95% confidence interval was found.

3 Results and discussion

3.1 *Bungong kayee's* sensory evaluation

The preferences of *bungong kayee's* cake on color, flavor and texture parameters were shown in Table 1.

Table 1. *Bungong kayee* cake hedonic test.

Product Sample	Measured parameters		
	Color	Flavor	Texture
1st week	4.40 ^a ± 0.95	4.11 ^a ± 1.51	4.26 ^a ± 1.22
2st week	4.49 ^a ± 0.82	4.20 ^a ± 1.36	4.43 ^a ± 1.34
3st week	4.51 ^a ± 1.12	4.29 ^a ± 1.75	4.69 ^a ± 1.49

3.2 Color

Color is one of the parameters that consumers consider in choosing a food product. Color is the first attribute of food that is captured by panelists before recognizing other attributes through sensory stimulation [10, 11]. *Bungong kayee* has a bone white to pale yellow and light color. This color is obtained from the cooking process with oil using low heat, so it has a color that is almost the same as the cork egg cake. The hedonic test value on color showed no significant difference in *bungong kayee* in all productions. This showed that the craftsmen processed the product consistently in the stable quality. Determining of *bungong kayee's* cooking level was done manually using five visual senses so that the level of color produced varies depending on the individual who judges the quality frying time.

Sensory assessment of *bungong kayee's* hedonic test which was further tested using Duncan's test at (< 0.005) confidence interval. In the three ranges, the color value ranged from 4.40 to 4.51 (likes). The color data shown (Table 1) is not significantly different, which means that the resulting color production is consistent and stable. Figure 1 showed that the sensory value of *bungong kayee* color is in the range of number 4 (yellow ginger) means that the difference between productions was not too big. However, in this study, the most preferred color by the panelists was the color of *bungong kayee* cake in the 3rd week of production.

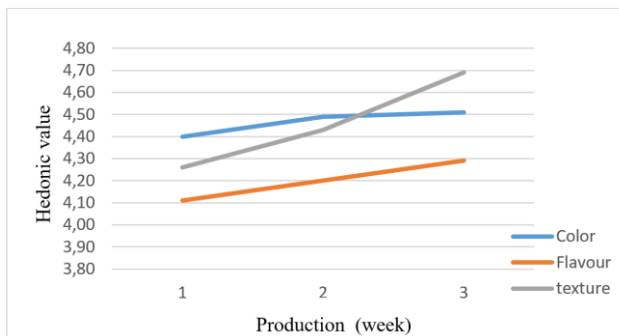


Figure 1. Graph of *bungong kayee's* hedonic value.

3.3 Flavor

The sweet taste of *bungong kayee*'s cake comes from the liquid sugar layer placed on the surface of the cake as a garnish and flavoring agent. The addition of other raw materials such as sugar, margarine and egg yolk in the manufacture of cookies also increases the taste of cookies, because sugar tends to give a distinctive taste by the presence of caramelization during the oven process. There are several factors that can affect taste, including chemical compounds, temperature, concentration and interactions of other flavor components [12].

Sensory evaluation (Table 1.) using hedonic test for the taste of *bungong kayee* was not significantly different in all production intervals. This indicated that the level of consistency in the dough making process was carried out correctly by adding the same amount of raw materials composition at each production interval so that the consistency of the cake taste is the same. The hedonic test values ranged from 4.11 to 4.29 (likes) from all productions. It is also shown in Figure 1 that the flavor of hedonic test is in the range of number 4 (sweet) with a slight difference between the production intervals. Biscuits are expected to be sweet, and it was not unexpected that all clusters were homogeneous in considering it a positive attribute; indeed, sweet as a driver of liking [13, 14]. some clusters they potentially could have a big impact on liking, and in others could contribute minimally. This could depend on the individual preferences of clustered subjects [13]. Based on the range of hedonic quality values, it shows that the panelists liked the taste of *bungong kayee* in all production intervals, with the taste of the 3rd week production being more preferable than the 1st and 2nd week production.

3.4 Texture

Texture generally contributes to the overall acceptability of biscuits, and it was seen that some textural attributes such as crispy, easy to swallow and easy to chew had a positive effect on liking score, whereas hard, hard to chew, mealy and sandy were negative drivers of acceptance [13]. Therefore, the best texture value is the value most favored by consumers or panelists. *Bungong kayee* has a soft and crunchy texture, this texture is formed when a dough containing protein is heated, so that the denaturation process occurred. Protein denaturation is a process of changing the molecular structure without breaking the covalent bonds, where there is a breakdown of hydrogen bonds, hydrophobic interactions, salt bonds and the unfolding of folds of protein molecules [15].

Sensory assessment of hedonic test (Table 1 and Figure 1) showed that there was no significant difference in texture of *bungong kayee*'s at the 1st week, 2nd week and 3rd week of production. While on the flavor variable, this indicated the consistency level in the dough making process by adding the the same amount of raw material at each production interval so that the texture of the cake in all productions is broadly the same. In the three productions, the sensory values of hedonic texture test ranged from 4.26 to 4.69 (like). This is also shown in Figure 1 that the sensory value of *bungong kayee*'s texture is in the range of number 4 (crispy) with a slight difference between productions. The crunchy texture of the *bungong kayee* cake is caused by the protein denaturation process. At the time of cooking, the protein will undergo a denaturation process where the reactive groups on the protein will open and then there will be re-binding between adjacent reactive groups so that the bond becomes stronger and result in increasing product hardness [15].

In addition, the level of crispness of the product is also influenced by the type of flour used in the dough where glutinous rice flour and tapioca flour contain more amylopectin than amylose. Tapioca contains high amylopectin which has sticky properties during gelatinization process and adds crispness to the product [5]. In addition, eggs have a role in *bungong kayee* dough as an emulsifier because egg yolks contain natural emulsifiers that help

to produce a smooth dough. The lecithin content in egg yolks helps to emulsify the dough so that it becomes more compact. The addition of coconut milk also affects the texture of *bungong kayee*. Thick coconut milk, which contains fat, can protect proteins, especially those contained in eggs and flour so that they can be coagulated when heated [10].

Based on the sensory test in hedonic quality (Table 1 and Figure 1), the panelists preferred *bungong kayee* cake in the 3rd week production although in general all the production intervals were favored by the panelists.

4 Conclusion

Results of *bungong kayee*'s cake sensory evaluation on the parameters of color, flavor and texture had the same value at all production intervals. This indicated that the color, flavor and texture produced between the 1st week, 2nd week and 3rd week of production of *bungong kayee* cake had a good and stable consistency value during the processing with the same amount addition of raw materials in every production. However, the color, flavor, and texture preferred by the panelists were *bungong kayee* cake in the 3rd week production, although in general all productions were favored by the panelists.

Authors would like to thank Teuku Umar University for funding this research through an Internal Grant in accordance with the Assignment Agreement for the Implementation of Expert Assistant Research (PPA) for Fiscal Year 2020/2021 Number: 028/UN59.7/PT.01.03/2021 Dated March 5, 2021, so that this research could be carried out to completion.

References

1. J. Wanjiru Maina and C. Juliana Wanjiru Maina Murang, *The Pharma Innovation Journal* **7**, 5 (2018)
2. J. Lado, A.I. Moltini, E. Vicente, G. Rodríguez, P. Arcia, M. Rodríguez, and G. Ares, *Agrociencia (Uruguay)* **23**, 1 (2019)
3. M. Nakitto, S.D. Johanningsmeier, M. Moyo, C. Bugaud, H. de Kock, L. Dahdouh, and T. Muzhingi, *Food Quality and Preference* **101**, 104628 (2022)
4. Y.M. Lubis, S. Rohaya, and H.A. Dewi, *Jurnal Teknologi dan Industri Pertanian Indonesia* **4**, 2 (2012)
5. A. Suciati, *E- Jurnal Boga* **3**, 3 (2014)
6. L. Hasan, N. Yusuf, and L. Mile, *The NIKe Journal* **2**, 3 (2014)
7. I.E. Fuadah, *Jurnal Tata Boga* **5**, 3 (2016)
8. Y. Yusriana, N.M. Erfiza, J. Jainuddin, and C. Nilda, *Jurnal Teknologi dan Industri Pertanian Indonesia* **9**, 2 (2017)
9. M.C. Meilgaard, B.T. Carr, and G.V. Civille, *Sensory evaluation techniques* (CRC press, Florida, 1999)
10. G. Giuberti, A. Bresciani, M. Cervini, A. Frustace, and A. Marti, *European Food Research and Technology* **247**, 3 (2021)
11. M.I. Rasyid, S. Maryati, N. Triandita, H. Yuliani, and L. Angraeni, *Jurnal Teknologi Pengolahan Pertanian* **2**, 1 (2020)
12. S. Walker, K. Seetharaman, and A. Goldstein, *Food Research International* **48**, 1 (2012)

13. M. di Cairano, N. Condelli, F. Galgano, and M.C. Caruso, *Int J Food Sci Technol* **57**, 4 (2022)
14. M. Sinnott, *Carbohydrate chemistry and biochemistry: structure and mechanism* (Royal Society of Chemistry, London, 2007)
15. L.S.S. Mello, E.L. Almeida, and L. Melo, *Food Research International* **122** (2019)