Sulaiman.pdf

by Sulaiman Artikel

Submission date: 07-Oct-2022 06:34AM (UTC+0700)
Submission ID: 1918667819
File name: Sulaiman.pdf (245.68K)
Word count: 6861
Character count: 35892

ANALYSIS OF THE PHYSICOCHEMICAL AND SENSORY QUALITY OF ADEE CAKE DURING STORAGE

Ismail Sulaiman*, Syarifah Rohaya, Muhammad Ichsan****

**Department of Agricultural Product Technology, Universitas Syiah Kuala, Banda Aceh, Indonesia, Center of Organic Farming Development, Universitas Syiah Kuala, Banda Aceh, Indonesia, ismail.sulaiman@unsyiah.ac.id*

***Department of Agricultural Product Technology, Universitas Syiah Kuala, Banda Aceh, Indonesia, syarifahrohaya@unsyiah.ac.id, isanalfajri@gmail.com*

Email Correspondence : syarifahrohaya@unsyiah.ac.id

Received : July 13, 2021 Accepted : August 7, 2022 Published : October 1, 2022

Abstract: Cake is a wet food product made by baking dough from flour, sugar, eggs, milk, fat, and other additives. Adee cake is one of the typical foods marketed in the Pidie area, which is very famous and becomes one of the foods as souvenirs. The problem faced with this cake is the shelf life and quality of the cake. Therefore, this research was carried out about the physicochemical properties of Adee cake during the storage process and to observe the sensory properties. This study used a completely randomized design (CRD) with a non-factorial pattern, namely storage time consisting of (0, 1, 2, 3, and 4 days) with three repetitions. Further tests of DMRT will follow the analysis of variance ANOVA in this study. The results of the hardness analysis obtained an average of 51.43 gf. The color analysis showed that the average coefficient value was 111 on the top and 252 on the inside showing a very significant difference. Chemical analysis obtained the average, namely, water content 39.30%, ash content 0.79%, fat content 7.94%, protein content 1.82%, crude fiber content 0.70%, and carbohydrates 49.76%, showed a very significant difference (P≤0.01). The organoleptic test analysis (hedonic) obtained the average, namely, color 3.63, texture 3.29, flavor 3.64, taste 3.30, and overall 3.46 showed a very significant difference (P≤0.01).
Keywords: adee cake; shelf-life; quality; sensory

Abstrak: Cake merupakan salah satu produk makanan semi-basah yang dibuat dengan pemanggangan adonan dari tepung, gula, telur, susu, lemak dan bahan tambahan lainnya. Cake adee ini merupakan salah satu makanan khas yang dipasarkan di daearah Pidie, yang sangat terkenal dan menjadi salah satu makanan sebagai oleh-oleh, problem yang dihadapi pada cake ini adalah masa simpan dan kualitas dari kue tersebut, oleh karena itu dilakukan penelitian tentang sifat fisikokimia kue Adee selama proses penyimpanan dan mengamati sifat sensorisnya. Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) dengan pola non faktorial yaitu lama penyimpanan yang terdiri dari (0, 1, 2, 3, dan 4 hari) dengan tiga kali pengulangan. Selanjutnya uji DMRT akan mengikuti analisis varians ANOVA pada penelitian ini. Hasil analisis kekerasan diperoleh rata-rata 51,43 gf, hasil analisis warna menunjukkan nilai koefisien rata-rata 111 pada bagian atas dan 252 pada bagian dalam menunjukkan perbedaan yang sangat signifikan. Analisis kimia diperoleh rata-rata kadar air 39,30%, kadar abu 0,79%, kadar lemak 7,94%, kadar protein 1,82%, kadar serat kasar 0,70%, dan karbohidrat 49,76%, menunjukkan perbedaan yang sangat nyata (P≤0,01). Uji organoleptik (hedonik)

diperoleh rata-rata yaitu warna 3,63, tekstur 3,29, rasa 3,64, rasa 3,30, dan keseluruhan 3,46 menunjukkan perbedaan yang sangat nyata (P≤0,01).
Kata kunci: kue ade; masa simpan; kualitas; sensori

Recommended APA Citation :
Sulaiman, I., Rohaya, S., & Ichsan, M. (2022). Analysis of The Physicochemical and Sensory Quality of Adee Cake During Storage. *Elkawnie*, *8*(1), 27-41. https://doi.org/10.22373/ekw.v8i1.10239

Introduction

Adee cake is an original cake from the Meureudu Aceh, Pidie Jaya. Adee cake is made from cassava as the main ingredient, with added sugar, coconut milk, and eggs (Muhardiansyah, Safriani, & Husna, 2017). Adee cake has a distinctive taste, namely savory, sweet and legit. Adee cake has two essential ingredients: Adee cake made from cassava and Adee cake made from wheat flour. This Adee cake was created during Ramadan (as a meal for breaking the fast) or on Eid (a traditional dish). But now, Adee cakes are starting to be produced sustainably and traded (Zurriyati, 2019).

Adee cake is a wet food product that can only last 1-2 days after being produced. In principle, Adee cake is safe for consumption because it is made from all-natural ingredients without adding preservatives and synthetic dyes (Rahmad, 2017). Wet cakes spoil very quickly compared to pastries. The water content in moist cakes is significantly higher. Damage that often occurs in wet cakes is a change in taste, flavor, texture, and appearance (Ceylan, Bilgiçli, & Cankurtaran, 2021; Jannah, 2020).

Storage temperature is a significant factor in the shelf life product of Adee cake. For wet food products, a suitable storage temperature is room temperature (23-25^{0}C) (Sitanggang, 2017). The storage temperature strongly influences the damage period; the higher the storage temperature, the shorter the damage period. The higher the storage temperature the rate of chemical reactions will faster field(Giannoukos, Rigby, Rochelle, Milodowski, & Hall, 2021).

It is suspected that Adee cakes will change in physical, chemical, and sensory quality during storage. Therefore, this study was conducted to determine changes in Adee cake's physical, chemical, and sensory properties during storage.

Methods

Materials and Instruments

Materials used in making Adee; cassava, eggs, margarine, sugar, coconut milk, and water. Materials used during research in the analysis were K_2SO4, HgO, H_2SO_4, H_2BO_3, NaOH-$Na_2S_2O_3$, and HCl by Merck.

Equipment used in making Adee cake products consist of: a baking sheet, a basin, a knife, a spoon, a grater, and an oven. The analytical tools used consist of standard laboratory equipment, for example, a texture analyzer *(LFRA Texture*

Analyzer)-TA-XT Plus, camera (Cannon D55), photo studio (Intex), petri dish, test tube, volume pipette, dropper, desiccator (OSK13235A), analytical balance, porcelain dish, measuring flask, soxhlet, stone boiling, Kjeldahl (Memmert), distillation, indicator, Erlenmeyer (Memmert), burette (Memmert), measuring cup and filter paper.

Procedure

This study used a completely randomized design (CRD) with a non-factorial pattern. Factor The storage time used is 5 levels, namely A1= 0 day, A2= 1 day, A3= 2 days, A4= 3 days and A5= 4 days.

Each analysis was carried out with three repetitions times to get 15 experimental units. Statistical analysis in this study used ANOVA (Analysis of variance) (Sastrosupadi, 2000). If the treatment given shows significant results, it will be continued with the DMRT test (Duncan Multiple Range Test) at 1% and 5%.

The processing Adee

The Adee cake begins with the stages of making grated cassava: The best quality cassava is sorted by 1 kg. Cassava is peeled using a knife. Cassava is washed thoroughly using clean water. Cassava is grated using a grater. Grated cassava is drained to remove water. Grated cassava will then be processed.

The following stages of baking Adee cake: Early stages of baking Adee cake are prepared with all the ingredients to be used (cassava, sugar, eggs, and coconut milk). Grated cassava as 800 grams mixed with 300 grams of sugar and one egg and stirred until evenly distributed. The dough has been started is then added with 350 ml of coconut milk and went again until the coconut milk blends with the dough. The dough has been mixed well and is then poured into the cake pan Adee which has been smeared with margarine. The process of making cake dough is baked in the oven at a temperature of ±170 celsius for ± 40 minutes (Mellinda, 2018). Adee cake products that have been cooked are removed from the range and cooled for ± 30 minutes. The Adee cake was then tested with several analyzes.

The parameters Analysis

The sample analysis used in this study were: hardness (TA-XT Plus, 2010), color (RGB) (Yanti et al., 2022), water content (AOAC, 2012), ash content (AOAC, 2012), fat content (AOAC 2012), protein content (Kjeldahl method, 2005), crude fiber content-field field(Hollmann, Themeier, Neese, & Lindhauer, 2013) and carbohydrate content (Method by Different Nielsen, 2010). Furthermore, the organoleptic (hedonic) test (Setyaningsih et al., 2010), the assessment was carried out by 25 semi-trained panelists

Hardness

Analysis of the physical test level of hardness (Hardness) was carried out using a texture analyzer instrument. The sample or material is prepared, and then

the sample is placed on the texture analyzer object table. The tool is run, select the probe that matches the sample. For solid samples choose a cylindrical probe. The probe on the instrument is lowered until it touches the sample. The number on the tool is zeroed first. The computer will process the data resulting from the movement of the tool and the changes that occur in the form of a graph, the results show in gf units.

Color- RGB Method

Color analysis was carried out using the RGB (red, green, blue) method. The first step is to prepare samples, a camera, a mini photo box studio measuring 30×30 cm and a laptop. A sample of Adee's cake of 3×3 cm was taken and placed in a Photo box studio and then photographed with the same light conditions and a distance of 30 cm for all samples. Samples were taken 3 times photos. The results of the photos are entered into the Adobe Photoshop application and the RGB values are seen. The RGB values taken in Adobe Photoshop are 6 points per sample and the average value of the 6 points is calculated. Next, the average values of R, G, and B are entered on the website: https://www.rapidtables.com/web/color/RGB_Color.html to find out the color of the sample. The website will display sample colors according to their RGB values. Determination of the darkness of a sample can be done by calculating the RGB coefficient of the sample. This value is obtained by adding up the average values of R, G, and B for each sample. The higher the coefficient value of the RGB value produced, the brighter the sample color and vice versa. The lower the coefficient value of the resulting RGB value, the darker the color of the sample.

Results and Discussion

The level of hardness of food is one of the attractions for consumers and provides a distinctive appeal to food. Adee cake is expected to produce food that is standard for wet cake food.

Table 1. Research results

Storage time (days)	Hardness (gf)	RGB		PHYSICOCHEMICAL					
		Color surface	Color inside	Water content (%)	Ash content (%)	Fat content (%)	Protein content (%)	Crude Fiber Content (%)	Carbohidrat Content (%)
0	80,33	119	298	34,65	0,63	8,58	2,02	0,32	53,77
1	48,83	115	276	36,23	0,67	8,37	1,96	0,59	53,70
2	45,50	112	236	39,60	0,80	8,15	1,87	0,76	48,83
3	42,00	108	226	42,30	0,81	7,40	1,65	0,87	47,15
4	40,50	100	224	42,41	1,07	7,24	1,62	0,98	45,35

Hardness

Hardness is one of the analyzes to determine the texture of a product. Hardness can be said to be an important factor in cakes to be accepted by consumers, hardness in cakes can be formed by the levels of protein and fat in the composition of the cake. Hardness in a product is resistance to pressure that can change the shape of a product and can even destroy a product (Andawulan, 2010; Polak, Coutts, Murray, & Marshall, 2019).

The resulting hardness values ranged from 40.50 gf - 80.33 gf with an average of 51.43 gf. Adee cake hardness experienced a very significant change ($P \leq 0.01$), and the hardness value in all samples consistently decreased during four days of storage Table 1.

The level of hardness can reduce the water content caused to be the evaporator. According to (Khairunnisa & Sufiat, 2017), The longer the storage, the product's hardness will decrease. The water content can come from the breakdown of sugar, starch, and compounds in this cake. (Wahyudi & Purwandari, 2018) The longer the storage, the hardness of the product will decrease. Violence food products are generally determined by the content of water, fat, and carbohydrate structure (cellulose, starch, and pectin compound) in the product.

This study is in line with research conducted by Kinthan, (2018) that mud cakes stored for 6 days at room temperature cause the hardness value of the cake to decrease. This decrease was due to swelling of the starch granules between the amylose bonds, so the relationship between the amylose bonds decreased, as a result, the starch gel firmness was low so the hardness of the product decreased.

According to Fellows, (2009) said that the longer the storage, the hardness of the product will decrease. The hardness of food products is generally determined by the water content, fat, and carbohydrate structure (cellulose, starch, and pectate compounds) present in the product. (Kerdpiboon, Charoendee, Chuntawong, & Asawachit, 2012) explains that the product storage process will cause the water content to increase which causes the level of hardness to decrease. Nur, (2013) states that the decrease in the level of hardness is caused by a decrease in the volume of the cake because the longer the cake is stored, it will cause the volume of the cake to decrease which can result in the level of hardness of the cake also decreasing.

Color

Determination of the quality of food products is generally very influenced by several factors, such as color, texture, taste, and nutritional value. Color is a very influential factor in the quality of a food product. In addition to being a determinant of the quality of food products, color can also be used as a parameter for the maturity of a product. The good color of a food product can attract the attention of consumers so that it can be used as a promotional tool (Cahyadi, 2009). From the above factors, it can be seen that color is very important in a food product, this is the reason for color testing in this study.

Determination of color can be done by various methods, one of which is the RGB method (red, green, blue) in determining the color of a product, this test is carried out by measuring the color level of a product in the form of coefficient values to get the color value and degradation of a color produced (Zhang, Zheng, & Tao, 2021; Zhou, Fan, Cheng, Shen, & Shao, 2021).

Table 1 shows the color change of the surface Adee cake for four days of storage at room temperature. The resulting coefficient values ranged from 100-119 with an average of 111. The color coefficient value of the upper part experienced a significant change ($P \leq 0.05$), and the color coefficient value in all samples consistently decreased during four days of storage.

The color change of the inside of Adee cake during four days of storage temperature. The resulting coefficient values ranged from 224-297 with an average of 252. The inner color coefficient value changed significantly ($P \leq 0.01$), and the color coefficient value in all samples consistently decreased during four days of storage. This decrease in color can be caused by storage temperature; the color of cassava can turn brown (Marsigit, Marniza, & Monica, 2019).

Products stored after processing will experience a decrease in appearance, and the color will turn dark. A fast oxidation reaction can cause a color change. The oxidation reaction of unsaturated fats can cause the product to undergo color degradation during the storage process (Vannia, 2017).

Table 2. Color coefficient value at the surface and inside Adee cake

Storage Time (day)	Surface				Inside			
	Value RGB		Coefficient Value	Color Code	Value RGB		Coefficient Value	Color Code
0	R	62	119		R	123	297	
	G	31			G	108		
	B	26			B	66		
1	R	58	115		R	118	276	
	G	32			G	100		
	B	25			B	58		
2	R	58	112		R	103	236	
	G	30			G	85		
	B	24			B	48		
3	R	46	108		R	103	225	
	G	31			G	81		
	B	31			B	41		

Storage Time (day)	Surface				Inside			
	Value RGB		Coefficient Value	Color Code	Value RGB		Coefficient Value	Color Code
4	R	50	100		R	97	224	
	G	27			G	80		
	B	23			B	47		

Water Content

The water content in a product greatly affects the taste, texture, shelf life, and even the consumer's liking for the product. The lower the water content in a product, the longer the shelf life of the product. According to Haryadi (2008), the presence of water content in food products can affect chemical, microbiological, and enzymatic processes.

Table 1. Shows the percentage of water content in Adee cake for four days of storage at room temperature. The rate of water content produced ranged from 34.65% - 42.41%, with an average of 39.30%. The percentage of the water content of Adee cake experienced a very significant change ($P \leq 0.01$), and the rate of water content in all samples consistently increased during four days of storage. This increase in water content is probably due to the breakdown of cellulose, starch, and compounds present in the cake during the storage processed field (Engel, Ambrosi, & Tessaro, 2019).

The water content in a food ingredient is one of the most influential factors in the shelf life; the higher the water content in a product, the shorter the product's shelf life. The increase in water content occurs due to the metabolic processes of microbes. The starch molecules can also cause an increase in water content in the product in the development expansion; it will cause the dissolution of starch and increase water content (Suladra, 2020).

Ash Content

Ash content is minerals from a food product that is left after complete combustion. Ash content can also describe the number of minerals in a product that is not burned and will become volatile substances. (Dayu Putri & Dyna, 2019; Sefa-Dedeh & Agyir-Sackey, 2004; Subagio & Windrati, 2012) explained that the high ash content produced after the combustion was carried out indicated the high mineral content of the material.

The percentage of ash content in Adee cake for four days of storage at room temperature. The rate of ash content produced ranged from 0.63% - 1.07%, with an average of 0.79%. The percentage of Adee cake ash content experienced a very significant change ($P \leq 0.01$), and the rate of ash content in all samples consistently increased during four days of storage. An increase in water content probably causes this increase in water content. The more extended the storage time, the more water is evaporated from a product.

The high ash content during storage was due to the growth of microbes in the cake. The longer the storage process, the more microbes will grow, which causes more ash content to be produced. The higher the ash content of a food product, the product's durability will decrease, and the shelf life of food tends not to last long (Inayah, 2017).

Fat content

Fat is an energy source that contains the most calories compared to protein and carbohydrates. Fat content in a food product is very important so that the caloric value in a food ingredient can be controlled properly before entering the body. (D. Muchtadi & Astawan, 1999; T. R. Muchtadi & Ayustaningwarno, 2010) explains that 1 gram of fat will produce 9 kcal, more when compared to protein and carbohydrates which only produce calories of approximately 4 kcal. In addition to the calorific value, the purpose of adding fat in the processing of food is to add a savory taste and improve the appearance and structure of a product.

The percentage of fat content in Adee cake for four days of storage at room temperature. The rate of water content produced ranged from 7.24% - 8.58%, with an average of 7.95%. Adee cake fat percentage changed significantly ($P \leq 0.01$), and the fat content percentage in all samples consistently decreased during four days of storage. This decrease in fat content is probably caused by the hydrolysis reaction of fat that occurs while the cake is stored. This hydrolysis reaction can also cause a change in the flavor of this cake to a sour smell.

The decrease in fat content can be influenced by temperature in the cooking process, contamination, packaging process, and product storage time (Amniyah, 2019). The decrease in fat content can also be caused by the development of microorganisms present in the cake. It is easy for a fat hydrolysis reaction to occur during cake storage, resulting in the product not lasting long (Sari, 2019).

Protein Content

Protein is one of the most important food substances for the body. This is because protein functions as fuel in the body, and also functions as a regulator of the metabolism of building blocks in the body. Protein in food consumed by humans will be absorbed by the intestine in the form of amino acids (Razak, 2017; Utari, Rimbawan, Riyadi, Muhilal, & Purwantyastuti, 2011; Winarno, 2004).

The percentage of protein content in Adee cake for four days of storage at room temperature. The rate of protein produced ranged from 1.62% - 2.02%, with an average of 1.82%. The percentage of Adee cake protein content experienced a very significant change ($P \leq 0.01$), and the rate of protein content in all samples consistently decreased during four days of storage. Reduced levels of this protein may be caused by the growth of microbes on the cake that can degrade the protein content in the cake so that more and more, the development of molds will make proteins diminish.

During storage, the product may experience denaturation of proteins that can cause a decrease in protein levels. The reduction in protein content is due to the amount of mold in the cake will increase as the storage day goes on with the growth of microbes that produce protease enzymes that play a role in degrading proteins in the sample as a source of nutrition for their survival (Soputan, Mamuaja, & Lolowang, 2016).

Crude Fiber Content

According to (Andawulan, 2010), crude fiber is one type of carbohydrate found in cassava and sweet potato. Crude fiber is part of dietary fiber that cannot be digested by digestive enzymes in the body. Crude fiber is also insoluble in H_2SO_4 and NaOH. Processed food products that have high fiber content tend to be low in crunchiness. Apart from the fiber content, the crispness can also be affected by the water content.

The percentage of crude fiber content in Adee cake for four days of storage at room temperature. The rate of crude fiber produced ranged from 0.32% - 0.98%, with an average of 0.70%. Adee cake percentage of crude fiber content experienced a very significant change ($P \leq 0.01$), and the rate of crude fiber content in all samples consistently increased during four days of storage. The increase in crude fiber content is probably due to the rise in water content. Crude fiber can bind water content during the storage process.

The increase in crude fiber is closely related to the increase in ash content in a food product. Crude fiber content also has a relationship with ash content; if the crude fiber produced is high, it will have the same effect as the ash content in a food ingredient (Inayah, 2017; Pérez, Gutiérrez, De Delahaye, Tovar, & Lares, 2007; Tobaruela et al., 2018).

Carbohydrate Content

Carbohydrates are one of the nutrients needed by the body to become energy for humans body. In general, carbohydrates are grouped into two types, namely simple carbohydrates and complex carbohydrates. Simple carbohydrates consist of monosaccharides, disaccharides, and oligosaccharides. While complex carbohydrates consist of polysaccharides and polysaccharides other than starch. Another function of carbohydrates for the body is to conserve protein, regulate metabolism, and give food a sweet taste (Sanggramasari, 2019).

The percentage of carbohydrates in Adee cake for four days of storage at room temperature. The carbohydrate ratio ranged from 45.35% - 53.77%, with an average of 49.76%. Adee cake percentage of carbohydrate content experienced a very significant change ($P \leq 0.01$), and the rate of carbohydrates in all samples consistently decreased during four days of storage. The decrease in carbohydrate content was probably caused by water, ash, fat, protein, and crude fiber content. If the water content, ash content, fat content, protein content, and crude fiber content increase, the carbohydrate content will decrease, and vice versa.

The content of decreased carbohydrates in a food product can be influenced by several factors, such as increasing levels of reducing sugars in the development and the activity of microorganisms in reducing starch during storage explainedined that the carbohydrate content decreased due to the interaction of sugar molecules with protein compounds and water. Sugar molecules are the simplest forms of carbohydrates (Kusumaningrum, Ariani, Khasanah, & Wiyono, 2017).

Sensory

This study conducted the sensory test based on the preference test (hedonic) with 25 semi-trained panelists(Mangan, 1992). The purpose of the hedonic test is to determine the panelists' response to the quality of Adee cake which includes color, texture, flavor, taste, and overall. The hedonic test is assessed. On a scale between 1-5. (1) intensely disliked, (2) disliked, (3) neutral, (4) like, and (5) very much like.

Table 2. Result value for the sensor

Storage time (days)	Sensory				
	color	texture	aroma	taste	overall
0	4,28	4,08	4,68	4,40	4,28
1	3,92	3,88	4,32	4,04	4,04
2	3,60	3,36	3,68	3,48	3,52
3	3,32	2,80	3,08	2,68	3,08
4	3,04	2,32	2,44	1,92	2,36

Color

The panelists' preference for the color of Adee cake for four days of storage at room temperature. The resulting values ranged from 3.04 (neutral) to 4.28 (likes), with an average value of 3.63 (preferences). The color assessment experienced a very significant change (P≤0.01), and the color rating consistently decreased for four days of storage.

Color is the most influential factor in the level of preference for a product. The color change that occurs is the color becomes darker with the length of storage. This change can be caused by an enzymatic reaction of *Polyphenol Oxidase*, which causes the color of cassava to turn brown and can change the color of a product. This change caused the panelists' preference for color to be reduced because the panelists prefer lighter colors over dark colors (Vannia, 2017).

Texture

The panelist assessment of the texture of Adee cake for four days of storage at room temperature. The resulting values ranged from 2.32 (dislike) to 4.08 (like), with a mean value of 3.29 (neutral). Texture assessment experienced a

significant change (P≤0.01), and texture assessment consistently decreased during four days of storage.

The longer the storage process, the panelists' preference for the texture of the product; this is due to the change in the cake, such as an increase in water content during the storage process, which causes the cake to become mushy. Panelists prefer products that are firmer than those that are already mushy (Kinthan, 2018).

Flavor

The panelists' assessment of Adee cake's flavor for four days of storage at room temperature. The resulting value ranges from 2.44 (dislike) to 4.68 (likes very much) with an average value of 3.6 preferences). The panelist preference experienced a very significant change (P,≤0.01), and the panelist's preference decreased for four days of storage.

The decrease in panelist preference was thought to be caused by the hygroscopic fat in the cake. The fat in the cake can absorb substances in other ingredients, causing odor absorption to be faster and easier. Fat can come from coconut milk which has compounds nonyl methyl ketone and is volatile so the more extended storage will cause an acidic flavor (Ben Jeddou et al., 2017; Sari, 2019).

Taste

The panelists' assessment of Adee cake's flavor for four days of storage at room temperature. The resulting values ranged from 1.92 (dislike) to 4.4 (like), with an average value of 3.30 (neutral). The taste assessment experienced a very significant change (P≤0.01), and the taste assessment consistently decreased during four days of storage.

Several factors can affect taste changes, namely temperature, chemical compounds, and interactions with other flavor components. Decreased preference of panelists can be caused by changes in the product's taste that come from additional ingredients such as sugar, coconut milk, and eggs while the product is stored. These other ingredients can cause the cake not to last long, and the cake tastes sour. Therefore, the panelist's assessment decreases with the time the cake is stored (Medani, 2019).

Overall

The panelist's overall assessment of Adee cake for four days of storage at room temperature. The resulting values ranged from 2.39 (dislike) to 4.28 (like), with a mean value of 3.46 (neutral). The overall rating experienced a very significant change (P≤0.01), and the overall rating consistently decreased during four days of storage. The longer the storage, the overall rating of Adee cake will decrease. The longer the storage process on the cake, the less the panelist's preference level will be; this is due to the changes in the cake, such as the increase in water content during the storage process, which causes the cake to become

mushy. The darker color change makes the cake unattractive even during storage; the cake will experience a difference in unpleasant flavor to the activity of microorganisms yield(Grata, 2020).

Conclusion

The results showed that Adee cake had different physical, chemical, and sensory characteristics and decreased after being stored at room temperature. The attributes of Adee cake experienced a significant change on the 3rd day. Adee cake showed a substantial difference in hardness, color, water, ash, fat, protein, crude fiber, carbohydrate content, and sensory (color, texture, flavor, taste, and overall). Therefore, Adee cake can only last for two days after being produced.

Acknowledgement

Authors thankfully for the researcher, laboratory assistant, and student Agriculture Product Technology, Universitas Syiah Kuala for good collaboration and supporting skills during the work.

References

Amniyah, W. (2019). Karakteristik Fisikokimia Edible Film Pati Umbi Bentul (Colocasia Esculenta L. Schott) Dengan Inkorporasi Ekstrak Bunga Rosella (Hibiscus Sabdariffa L) dan Agen Cross-Linking Asam Sitrat Serta Aplikasinya pada Kue Wajik. Universitas Muhammadiyah Malang.

Andawulan, N. (2010). Analisa Pangan. Jakarta: Dian Rakyat.

Ben Jeddou, K., Bouaziz, F., Zouari-Ellouzi, S., Chaari, F., Ellouz-Chaabouni, S., Ellouz-Ghorbel, R., & Nouri-Ellouz, O. (2017). Improvement of texture and sensory properties of cakes by addition of potato peel powder with high level of dietary fiber and protein. *Food Chemistry*, *217*, 668–677. https://doi.org/10.1016/j.foodchem.2016.08.081

Ceylan, H., Bilgiçli, N., & Cankurtaran, T. (2021). Improvement of functional cake formulation using Jerusalem artichoke flour as inulin source and resistant starch (RS4). *LWT*, *145*. https://doi.org/10.1016/j.lwt.2021.111301

Dayu Putri, V., & Dyna, F. (2019). Standarisasi Ganyong (Canna edulis ker) Sebagai Pangan Alternatif Pasien Diabetes Mellitus. *Jurnal Katalisator*, *4*(2), 111. https://doi.org/10.22216/jk.v4i2.4567

Engel, J. B., Ambrosi, A., & Tessaro, I. C. (2019). Development of biodegradable starch-based foams incorporated with grape stalks for food packaging. *Carbohydrate Polymers*, *225*, 115234. https://doi.org/10.1016/j.carbpol.2019.115234

Giannoukos, K., Rigby, S. P., Rochelle, C. A., Milodowski, A. E., & Hall, M. R. (2021). Carbonation rate and microstructural alterations of class G cement under geological storage conditions. *Applied Geochemistry*, *131*, 105007. https://doi.org/10.1016/j.apgeochem.2021.105007

Grata, K. (2020). Determining Cellulolytic Activity of Microorganisms. *Chemistry-Didactics-Ecology-Metrology*, *25*(1–2), 133–143. https://doi.org/10.2478/cdem-2020-0010

Hollmann, J., Themeier, H., Neese, U., & Lindhauer, M. G. (2013). Dietary fibre fractions in cereal foods measured by a new integrated AOAC method. *Food Chemistry*, *140*(3). https://doi.org/10.1016/j.foodchem.2012.12.005

Inayah, F. (2017). *Uji Kadar Serat Dan Daya Terima Kue Pukis Dengan Substitusi Tepung Kacang Merah (Phaseolus Vulgaris L)*. Universitas Muhammadiyah Surakarta.

Jannah, M. (2020). *Faktor yang Mempengaruhi Kepuasan Konsumen untuk Membeli Kue Adee (Kecamatan Meureudu Kabupaten Pidie Jaya)*. Universitas Islam Negeri Ar-Raniry.

Kerdpiboon, S., Charoendee, D., Chuntawong, N., & Asawachit, P. (2012). Effect of cooking methods on morphological and physical properties of Hang rice during cooking. *Agricultural Science Journal*.

Khairunnisa, & Sufiat, S. (2017). Substitusi Parsial Tepung Beras Dengan Tepung Ubi Jalar Ungu (Ipomoea Batatas L) Pada Pembuatan Kue Lapis. *Jurnal Ilmiah Mahasiswa Pendidikan Kesejahteraan Keluarga*, *2*(1).

Kinthan, P. (2018). *Pengaruh Penambahan Puree Labu Kuning Terhadap Tingkat Kesukaan Dan Karakteristik Fisikokimiawi Kue Lumpur*. Unika Soegijapranata Semarang.

Kusumaningrum, A., Ariani, D., Khasanah, Y., & Wiyono, T. (2017). Pengaruh Waktu Penyimpanan terhadap Karakteristik Makanan Tradisional "Jenang Saban". *Jurnal Penelitian Teknologi Industri*, *9*(1), 23–36.

Mangan, P. A. P. (1992). Performance assessment of sensory panelists. *Journal of Sensory Studies*, *7*(3). https://doi.org/10.1111/j.1745-459X.1992.tb00534.x

Marsigit, W., Marniza, & Monica, A. (2019). Pengaruh Jenis Kemasan dan Lama Penyimpanan Dalam Suhu Ruang Terhadap Mutu Dodol Pepaya. *Jurnal Agroindustri*, *10*(1), 57–66. https://doi.org/10.31186/j.agroind.10.1.57-66

Medani, P. I. (2019). *Kajian Potensi Kerusakan Klappertaart Selama Proses Pembuatan dan Penyimpanan*. Universitas Padjadjaran.

Muchtadi, D., & Astawan, M. (1999). *Kajian Terhadap Serat Makanan dan Antioksidan dalam Berbagai Jenis Sayuran untuk Pencegahan Penyakit Degeneratif*. Bogor: IPB-Press.

Muchtadi, T. R., & Ayustaningwarno, F. (2010). Teknologi proses pengolahan pangan. *Alfabeta. Bandung*, *246*.

Muhardiansyah, G., Safriani, N., & Husna, N. El. (2017). Pengaruh Suhu Pengeringan dan Pregelatinisasi Parutan Ubi Kayu (Manihot esculenta Crantz) terhadap Mutu Organoleptik "Kue Adee". *Jurnal Ilmiah Mahasiswa Pertanian*, *2*(4), 498–502. https://doi.org/10.17969/jimfp.v2i4.1216

Pérez, E. E., Gutiérrez, M. E., De Delahaye, E. P., Tovar, J., & Lares, M. (2007).

Production and characterization of Xanthosoma sagittifolium and Colocasia esculenta flours. *Journal of Food Science*, *72*(6). https://doi.org/10.1111/j.1750-3841.2007.00420.x

Polak, A., Coutts, F. K., Murray, P., & Marshall, S. (2019). Use of hyperspectral imaging for cake moisture and hardness prediction. *IET Image Processing*, *13*(7). https://doi.org/10.1049/iet-ipr.2018.5106

Rahmad, W. (2017). *Gampong Lampisang : Pusat Kue Tradisional Aceh Sebagai Penunjang Wisata*. Universitas Islam Negeri Ar-Raniry.

Razak, M. M. (2017). Ilmu Teknologi Pangan. *Kementrian Kesehatan Reoublik Indonesia*, *53*(9).

Sanggramasari, S. (2019). Effect of honey and stevia as sugar substitute on sensory evaluation of chiffon cake. *Journal of Business on Hospitality and Tourism*, *5*(1). https://doi.org/10.22334/jbhost.v5i1.134

Sari, N. Puspita. (2019). *Aplikasi Mocaf (Modified Cassava Flour) Pada Pembuatan Kue Lumpur : Kajian Proporsi Mocaf Dan Tepung Terigu Pada Sifat Fisikokimia Dan Sensoris*. Universitas Jember.

Sastrosupadi, A. (2000). *Rancangan percobaan praktis bidang pertanian*. Malang: Kanisius.

Sefa-Dedeh, S., & Agyir-Sackey, E. K. (2004). Chemical composition and the effect of processing on oxalate content of cocoyam Xanthosoma sagittifolium and Colocasia esculenta cormels. *Food Chemistry*, *85*(4), 479–487. https://doi.org/10.1016/S0308-8146(02)00244-3

Sitanggang, A. (2017). *Faktor Kerusakan Produk Bakeri dan Pengendaliannya*. Bogor: Institut Pertanian Bogor.

Soputan, D., Mamuaja, C., & Lolowang, T. (2016). Uji Organoleptik Dan Karakteristik Kimia Produk Klappertaart Di Kota Manado Selama Penyimpanan. *Jurnal Ilmu Dan Teknologi Pangan*, *4*(1), 18–27.

Subagio, A., & Windrati, W. S. (2012). Pengaruh Komposisi MOCAF (Modified Cassava Flour) dan Tepung Beras pada Karakteristik Beras Cerdas (Effect of Composition Mocaf (Modified Cassava Flour) and Rice Flour on Characteristics of Beras Cerdas). *Jurnal Pangan*, *21*(1).

Suladra, M. (2020). Pengaruh Penambahan Ubi Jalar Ungu (Ipomea Batatas L.) Terhadap Sifat Organoleptik Dan Aktivitas Antioksidan Pada Kue Yangko. *Agrotech : Jurnal Ilmiah Teknologi Pertanian*, *3*(1). https://doi.org/10.37631/agrotech.v3i1.171

Tobaruela, E. de C., Santos, A. de O., Almeida-Muradian, L. B. d., Araujo, E. da S., Lajolo, F. M., & Menezes, E. W. (2018). Application of dietary fiber method AOAC 2011.25 in fruit and comparison with AOAC 991.43 method. *Food Chemistry*, *238*. https://doi.org/10.1016/j.foodchem.2016.12.068

Utari, D. M., Rimbawan, Riyadi, H., Muhilal, & Purwantyastuti. (2011). Potency of Amino Acid in Tempeh for Improving Lipid Profile and Diabetes

Mellitus. In *Kesmas: National Public Health Journal*.

Vannia, V. (2017). *Penentuan Umur Simpan dan Tingkat Kesukaan Konsumen Pada Bika Ambon Labu Kuning*. Universitas Katolik Soegijapranata, Semarang.

Wahyudi, I., & Purwandari, U. (2018). Pengaruh Penambahan Kayu Manis (Cinnamomum Burmannii) Terhadap Kadar Air, PH, Ketengikan dan Tekstur Wingko Selama Penyimpanan. *Jurnal Teknologi Pangan*, *11*(2), 31–37. https://doi.org/10.33005/jtp.v11i2.894

Winarno. (2004). *Kimia Pangan dan Gizi*. Jakarta: PT. Gramedia Pustaka Utama.

Yanti, N. R., Andika, M., Maulida, S., Riani, Sulaiman, I., & Erfiza, N. M. (2022). Utilization of areca nut (*Arecha chatechu* L.) extract for tannin-based colorimetric indicator in smart packaging. *IOP Conference Series: Earth and Environmental Science*, *951*(1), 012057. https://doi.org/10.1088/1755-1315/951/1/012057

Zhang, S., Zheng, L., & Tao, W. (2021). Survey and Evaluation of RGB-D SLAM. *IEEE Access*, *9*. https://doi.org/10.1109/ACCESS.2021.3053188

Zhou, T., Fan, D. P., Cheng, M. M., Shen, J., & Shao, L. (2021). RGB-D salient object detection: A survey. *Computational Visual Media*, Vol. 7. https://doi.org/10.1007/s41095-020-0199-z

Zurriyati, A. (2019). *Taksonomi Ekoleksikon Peunajoh Aceh: Kajian Ekolinguistik*. Universitas Sumatera Utara Medan.

Sulaiman.pdf

ORIGINALITY REPORT

21%	16%	14%	12%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Syiah Kuala University Student Paper	5%
2	R Simanungkalit, T Karo-Karo, I Suhaidi. "Effect of ratio of oyster mushroom with straw mushroom and the type of filling flour on the quality of natural seasoning", IOP Conference Series: Earth and Environmental Science, 2021 Publication	2%
3	repository.unika.ac.id Internet Source	1%
4	Anna Twarogowska, Christof Van Poucke, Bart Van Droogenbroeck. "Upcycling of Belgian endive (Cichorium intybus var. foliosum) by-products. Chemical composition and functional properties of dietary fibre root powders", Food Chemistry, 2020 Publication	1%
5	link.springer.com Internet Source	1%

6	riunet.upv.es Internet Source	1 %
7	Submitted to Universitas Pendidikan Indonesia Student Paper	1 %
8	ejournal.widyamataram.ac.id Internet Source	1 %
9	Submitted to University of Queensland Student Paper	1 %
10	edepot.wur.nl Internet Source	1 %
11	A. Díaz, M.A. García, C. Dini. "Jerusalem artichoke flour as food ingredient and as source of fructooligosaccharides and inulin", Journal of Food Composition and Analysis, 2022 Publication	<1 %
12	Submitted to Sheffield Hallam University Student Paper	<1 %
13	Zhenjiao Du, Wenfei Tian, Michael Tilley, Donghai Wang, Guorong Zhang, Yonghui Li. "Quantitative assessment of wheat quality using near‐infrared spectroscopy: A comprehensive review", Comprehensive Reviews in Food Science and Food Safety, 2022	<1 %

	Publication	
14	I Sulaiman, C Annisa, Y M Lubis, Z F Rozali, S Noviasari, K Eriani, C W Asrizal. "Decreasing Oxalate Levels in Kimpul Tubers (Xanthosoma sagittifolium) by Physical and Chemical Methods", IOP Conference Series: Earth and Environmental Science, 2021 Publication	<1 %
15	garuda.kemdikbud.go.id Internet Source	<1 %
16	ejournal.unib.ac.id Internet Source	<1 %
17	Riswita Syamsuri, Wanti Dewayani, Erina Septianti, Maintang. "Chemical characteristic and sensory of tempeh sausage on different soybean varieties and cooking methods variation", IOP Conference Series: Earth and Environmental Science, 2020 Publication	<1 %
18	thescipub.com Internet Source	<1 %
19	jim.unsyiah.ac.id Internet Source	<1 %
20	digilib.unila.ac.id Internet Source	<1 %
21	repository.uph.edu Internet Source	

		<1 %
22	M Kamal, A A Munawar, M I Sulaiman. "Comparison of principal component and partial least square regression method in NIRS data analysis for cocoa bean quality assessment", IOP Conference Series: Earth and Environmental Science, 2021 Publication	<1 %
23	www.science.org Internet Source	<1 %
24	www.sciencegate.app Internet Source	<1 %
25	ejurnal.litbang.pertanian.go.id Internet Source	<1 %
26	www.neliti.com Internet Source	<1 %
27	N M Erfiza, N R Purba, K Ahda, I Sulaiman, S Rohaya, F Razi. "Characterization of tannin based colorimetric indicator and its application on fish packaging", IOP Conference Series: Earth and Environmental Science, 2021 Publication	<1 %
28	www.researchgate.net Internet Source	<1 %

29	S Noviasari, P S Assyifa, I Sulaiman. "Chemical and sensory properties of analogue rice based on kimpul flour (Xanthosoma sagitifolium)", IOP Conference Series: Earth and Environmental Science, 2022 Publication	<1 %
30	ejournal.warmadewa.ac.id Internet Source	<1 %
31	T Lubis, Ramlan, Dardanila, S Hasrul, T Nasution, A F Abus. "The peunajoh toward conservation of flora and fauna biodiversity in Aceh", IOP Conference Series: Earth and Environmental Science, 2022 Publication	<1 %
32	Gang Xu, Ze Yu, Guangxin Xing, Xingyu Zhang, Feng Pan. "Visual odometry algorithm based on geometric prior for dynamic environments", The International Journal of Advanced Manufacturing Technology, 2022 Publication	<1 %
33	repository.ar-raniry.ac.id Internet Source	<1 %
34	repository.itspku.ac.id Internet Source	<1 %
35	Submitted to Middle Tennessee State University Student Paper	<1 %

36 Yoyok Budi Pramono, Nurwantoro, Dian Handayani, Sri Mulyani, C. Hari Wibowo. "Physical, chemical, stickiness and organoleptic characteristics of analog white sweet potato rice with the addition of pumpkin flours", IOP Conference Series: Earth and Environmental Science, 2021 <1%
Publication

Exclude quotes	On	Exclude matches	< 15 words
Exclude bibliography	Off		

Sulaiman.pdf

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13

PAGE 14

PAGE 15