

Analisis Kandungan Gizi Dan Uji Organoleptik Kue Kering Berbasis Sorghum Sebagai Solusi Pemberian Makanan Tambahan Bagi Balita

Nutritional Content Analysis And Organoleptic Testing Of Sorghum-Based Cookies As A Solution For Supplementary Food Provision For Toddlers

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Abstrak

Kue kering merupakan makanan ringan yang umumnya terbuat dari tepung terigu, mentega, telur, dan susu bubuk. Sorghum yang kaya akan protein dan serat merupakan salah satu solusi pemberian makanan tambahan bagi balita. Pertanyaan penelitian ini adalah bagaimana kandungan protein, karbohidrat, lemak, dan serat kue kering sorghum, serta daya terima organoleptik kue kering sorghum, ditentukan. Tujuan penelitian ini adalah menganalisis kandungan protein, karbohidrat, lemak, dan serat, serta mengevaluasi sifat organoleptik kue kering sorghum. Penelitian ini bersifat deskriptif, dengan menggunakan uji Kjeldahl, ekstraktor Soxhlet, gravimetri, dan titrimetri untuk mengetahui kandungan protein, karbohidrat, lemak, dan serat, serta daya terima organoleptik kue kering. Dua puluh panelis merupakan mahasiswa jurusan gizi, Kesehatan Masyarakat, Universitas Negeri Gorontalo. Data dianalisis secara deskriptif, dengan tujuan utama untuk membuat gambaran atau deskripsi yang objektif tentang suatu keadaan. Hasil penelitian menunjukkan bahwa kue kering sorghum mengandung protein sebesar 7,21%. Kandungan karbohidrat sebesar 43,10%. Kandungan lemaknya 18,70%. Kandungan seratnya 5,76%. Berdasarkan hasil uji organoleptik, didapatkan nilai persentase panelis yang menyukai tampilan sebesar 85%, dari segi aroma didapatkan nilai persentase yang menyukainya sebesar 90%, dari segi tekstur didapatkan nilai persentase yang menyukainya sebesar 50%, dan dari segi rasa didapatkan nilai persentase yang menyukainya sebesar 90%. Disarankan untuk melakukan penelitian lebih lanjut tentang kandungan gizi lainnya, dan menguji ketahanan kue kering untuk mengetahui seberapa lama produk tersebut tahan lama dan layak untuk dikonsumsi. kontak dengan frekuensi paparan pestisida dan alat pelindung diri.

Kata Kunci: Kue, Kandungan gizi, Organoleptik, Sorghum

Abstract

Cookies are a snack generally made from wheat flour, butter, eggs, and powdered milk. Sorghum, rich in protein and fiber, is one solution for supplementary feeding for toddlers. The research question is how the protein, carbohydrate, fat, and fiber content of sorghum cookies, and the organoleptic acceptability of sorghum cookies, are determined. The objectives of this study were to analyze the protein, carbohydrate, fat, and fiber content, as well as to evaluate the organoleptic properties of sorghum cookies. The research was descriptive, using the Kjeldahl test, Soxhlet extractor, gravimetry, and titrimetry to determine the protein, carbohydrate, fat, and fiber content, as well as the organoleptic acceptability of the cookies. Twenty panelists were students majoring in nutrition, Public Health, Gorontalo State University. Data were analyzed descriptively, with the primary goal of creating an objective picture or description of a situation. The results of the study showed that sorghum cookies contain 7.21% protein. The carbohydrate content is 43.10%. The fat content is 18.70%. The fiber content is 5.76%. Based on the results of the organoleptic test, it was found that the percentage value of the panelists who liked the appearance was 85%, in terms of aroma, it was found that the percentage value of those who liked it was 90%, in terms of texture, it was found that the percentage value of those who liked it was 50%, and in terms of taste, it was found that the percentage value of those who liked it was

90%. It is recommended to conduct further research on other nutritional content, and test the durability of cookies to determine how long the product is durable and suitable for consumption.

Keywords: *Cookies, Nutritional content, Organoleptic, Sorghum*

BACKGROUND

Processed food products in Indonesia are experiencing an increase, particularly fast food and instant foods. Cookies are a popular processed product. This is due to their delicious taste, convenience, crunchiness, and long shelf life. The primary raw material for cookies is wheat flour. The dependence of industrial raw materials in food processing, including cookies, on wheat is high and must be imported, reaching 5 percent per year. High wheat imports, reaching 11.8 million tons in 2020, will burden the state. Cookies are small and attractive, making them popular among all ages, including children, teenagers, and adults (Rahmaniyah & Prasetyawati, 2020). Cookies can be made from sorghum, which provides a delicious texture and added nutrients, making them a healthier snack option for toddlers as a supplementary food.

The advantage of sorghum flour is its higher fiber and mineral content compared to wheat flour. Sorghum flour can be used as an alternative substitute for wheat flour-based foods. For example, cookies can use up to 80% sorghum flour. Other wheat flour-based foods that can be substituted include cakes, which can be substituted with 40-50% sorghum flour, noodles, and breads, which can be substituted with 30-35% sorghum flour (Mulyani, 2021). Substituting some wheat flour with sorghum flour can increase the nutritional value of snacks or snacks (Wahyani and Rahmawati, 2021).

The nutritional content of sorghum makes it a good choice for supplemental feeding for toddlers, helping to support their optimal growth and development. Sorghum plants are also more resistant to pests and diseases, so the risk of crop failure is relatively low (Suarni, 2016). Substituting sorghum flour in cookies not only minimizes the use of gluten-containing wheat flour, but is also easily digested by teenagers and adults and increases protein content. Sorghum is rich in protein, fiber, and essential minerals such as iron and calcium, as well as complex carbohydrates that support children's growth and development, provide long-lasting energy, and help children stay active and focused. This statement is relevant to Winiastri's (2021) research, which states that the sugar components contained in sorghum also take longer to digest than other types of cereals, and is a type of gluten-free cereal that is good for consumption.

Organoleptic testing of sorghum cookies is important to evaluate sensory properties such as taste, aroma, and appearance, so manufacturers can ensure product quality and consumer acceptance. Organoleptic testing is a test that relies on human senses to measure the acceptability of a product, be it the senses of sight, taste, smell and touch. Organoleptic testing of supplementary foods is crucial to ensure that the product is not only nutritious but also has an appealing taste and aroma, thus increasing children's interest in consuming it and supporting their growth.

The Ministry of Health has established a comprehensive policy, covering prevention, promotion/education and management of malnourished toddlers. Addressing malnutrition in toddlers is achieved through supplementary feeding. The Supplementary Feeding Program is an effort to improve the nutrition of children suffering from malnutrition or chronic illnesses. The providing additional food intervention program aims to improve children's nutritional status and meet their nutritional needs to achieve good nutritional status and age-appropriate nutritional conditions. Therefore, one of the Ministry of Health's solutions to stunting prevention is utilizing the nutritional content of sorghum.

METHODS

Research Design

This research uses a descriptive method, a research method conducted with the primary goal of creating an objective picture or description of a situation. Descriptive research is a research method aimed at describing existing phenomena, whether occurring currently or in the past.

Research Location and Time

This research was conducted at the Public Health Laboratory of Gorontalo State University, to identify the nutritional content carried out at the Balai Standarisasi dan Pelayanan Jasa Industri (BSPJI) Manado. This research was conducted for 2 months, namely April-May 2025

Research Instrument

Nutrient Content

The research instruments used include various laboratory equipment, measuring instruments, and data collection forms. Using appropriate instruments will ensure the accuracy and reliability of the nutritional analysis results.

Organoleptic test

The research instruments used included an assessment questionnaire, a scoring table, a feedback form, props, and clear testing procedures. The use of appropriate instruments will ensure that the organoleptic assessment can be conducted systematically and produce valid and reliable data. The organoleptic test measurement technique in this study used the following scale:

5: Very Like

- 4: Like
3: Kinda like it
2: Don't like
1: Very dislike

RESULT

Results of nutritional content tests on sorghum cookies

Based on the results of research conducted during the test of protein, carbohydrate, fat and fiber content of cookies according to the dosage, the following data was obtained.

Table 1. Results of the nutritional content test of sorghum cookies per 29 grams

No	Nutrient Content	Presentation (%)	Gram (gr)
1	Protein	7,21%	2,09
2	Carbohydrate	43,10%	12,50
3	Fat	18,70%	5,42
4	Fiber	5,76%	1,67

Source: Primary Data, 2025

Based on table 1, it shows that sorghum cookies have a nutritional value of 7.21% Protein which if converted is 2.09 grams, 43.10% Carbohydrate which if converted is 12.50 grams, 18.70% Fat which if converted is 5.42 grams and 5.76% Fiber which if converted is 1.67 grams. This shows that sorghum contributes positively to increasing the nutritional content of cookies. With this, 3 pieces of sorghum cookies a day can meet the additional intake of toddlers.

Organoleptic test results of sorghum cookies

This study conducted organoleptic tests, which included appearance, aroma, texture, and taste. The results of the organoleptic tests on sorghum cookies can be seen in the organoleptic quality test formula used by 20 panelists, who were students majoring in nutrition and public health at Gorontalo State University. The following aspects were assessed during the organoleptic testing phase.

1. Appearance

Table 2 Results of organoleptic tests of sorghum cookies in terms of appearance

No	Rating	Scale Number of Panelists	Presentation (%)
1	Very Like	5	25
2	Like	25	60
3	Kinda like it	3	15
	Total	20	100

Source: Primary Data, 2025

Based on table 2 above, it can be seen that the majority of panelists like the appearance of sorghum cookies, as many as 12 panelists (60%), very like them as many as 5 panelists (25%), and kinda like it as many as 3 panelists (15%).

2. Aroma

Table 3. Results of organoleptic tests of sorghum cookies in terms of aroma

No	Rating	Scale Number of Panelists	Presentation (%)
1	Very Like	10	50
2	Like	8	40
3	Kinda like it	2	10
	Total	20	100

Source: Primary Data, 2025

Based on table 3 above, it can be seen that the majority of panelists really like the aroma of sorghum cookies, as many as 10 panelists (50%), like it as many as 8 panelists (40%), and kinda like it as many as 2 panelists (10%).

3. Texture

Table 4 Results of organoleptic tests of sorghum cookies in terms of texture

No	Rating	Scale Number of Panelists	Presentation (%)
1	Very Like	3	15
2	Like	7	35
3	Kinda like it	8	40
4	Don't like	2	10

Total

20

100

Source: Primary Data, 2025

Based on table 4 above, it can be seen that most of the panelists quite like the texture of sorghum cookies, as many as 8 panelists (40%), like it as many as 7 panelists (35%), Verry like it as many as 3 panelists (15%), and Don't like it as many as 2 panelists (10%).

4. Flavor

Table 5. Results of organoleptic tests of sorghum cookies in terms of flavor

No	Rating	Scale	Number of Panelists Presentation (%)
1	Very Like	5	25
2	Like	13	65
3	Kinda like it	1	5
4	Don't like	1	5
	Total	20	100

Source: Primary Data, 2025

Based on table 5 above, it can be seen that the majority of panelists like the taste of sorghum cookies as many as 13 panelists (65%), verry like it as many as 5 panelists (25%), kinda like it as many as 1 panelist (5%), and don't like it as many as 1 panelist (5%).

Table 6. Results of the calculation of the percentage of organoleptic tests of sorghum cookies

No	Organoleptic Panelist Ratings	Who Presentation 54321	Gave a Score 4-5 (%)
1	Apperance	5 12 3	17 85
2	Aroma	10 8 2	18 90
3	Tekstur	3 7 8 2	10 50
4	Flavor	5 13 1 1	18 90

Source: Primary Data, 2025

Based on table 6 above, from the results of the organoleptic test, it is known that most of the panelists gave a score of 4-5, namely in terms of aroma and taste with a total of 18 panelists (90%), in terms of appearance with a total of 17 panelists (85%), and in terms of texture with a total of 10 panelists (50%)

DISCUSSION

Nutrient content of sorghum cookies

Research has shown that one sorghum cookie contains 7.21% protein. To obtain an idea of the actual nutritional value consumed by children, the protein content is converted to a per cookie weight of 29 grams. Therefore, one sorghum cookie contains 2.09 grams of protein. The protein content of sorghum cookies indicates that one cookie can provide additional daily protein intake for toddlers.

Sorghum cookies contain 43.10% carbohydrates. To obtain an idea of the actual nutritional value consumed by children, the carbohydrate content was converted to a per cookie weight of 29 grams. Therefore, one sorghum cookie contains 12.50 grams of carbohydrates. The carbohydrate content of cookies indicates that one cookie can provide additional carbohydrate intake to a toddler's daily needs.

Sorghum cookies contain 18.70% fat. To obtain an idea of the actual nutritional value consumed by children, the fat content was converted to a per-cookie weight of 29 grams. Therefore, one sorghum cookie contains 5.42 grams of fat. The fat content of cookies indicates that one cookie can provide additional fat intake to a toddler's daily needs.

Sorghum cookies contain 5.76% fiber. To obtain an idea of the actual nutritional value consumed by children, the fiber content was converted to a per-cookie weight of 29 grams. Therefore, one sorghum cookie contains 1.67 grams of fiber. The fiber content of cookies indicates that one cookie can provide additional daily fiber intake for toddlers.

Organoleptic Test of sorghum cookies

Based on the organoleptic test results for sorghum cookies, it was found that the panelists generally liked their appearance, aroma, texture, and taste. Generally, sorghum cookies are characterized by a light to dark brown color. This color is influenced by the baking process and the sugar content used. This is why 17 panelists (85%) preferred the appearance of the sorghum cookies.

The aroma of sorghum cookies has a savory and slightly sweet nuance, with a distinctive earthy touch from sorghum. This aroma differs from the aroma of cookies made with wheat flour, as sorghum provides a more natural and slightly coarse aroma. The sweet aroma is not as strong as cookies made with pure granulated sugar, but rather the natural sweetness of the grains, which is why the panelists preferred the aroma of sorghum cookies, with 18 panelists (90%).

Sorghum cookies tend to be hard and brittle, but with the right formulation, they can be crispy and slightly dense. This

texture is influenced by the fiber content of the sorghum flour and the addition of other ingredients, which is what determined the panelists' preference for the texture of the sorghum cookies, with 10 (50%) preferring it. Sorghum cookies generally have a slightly sweet and distinctive savory flavor. Sorghum flour offers a slightly earthy, naturally sweet flavor compared to wheat flour, and has a slightly nutty or grain-like flavor. This is why 18 panelists (90%) liked the sorghum cookies

CONCLUSION

Based on the research results above, the following conclusions were obtained: 1. The protein content of sorghum cookies is 7.21%, which when converted is equivalent to 2.09 grams. The carbohydrate content of sorghum cookies is 43.10%, which when converted is equivalent to 12.50 grams. The fat content of sorghum cookies is 18.70%, which when converted is equivalent to 5.42 grams. The fiber content of sorghum cookies is 5.76%, which when converted is equivalent to 1.67 grams. The panelists' most preferred aspects of the sorghum cookies were their aroma and taste. 90% of the panelists liked the fragrant aroma of sorghum cookies, 90% of the panelists liked the sweet taste, 85% liked the attractive color, and 50% liked the crunchy and soft texture.

RECOMMENDATIONS

1. More efforts are needed to introduce sorghum as a nutritious food ingredient to the public, especially in Gorontalo Province, so that people become more familiar with and utilize sorghum better.
2. It is recommended to conduct further research on various processed products from sorghum, besides cookies, such as bread and cakes, to expand healthy food choices.
3. A durability test is needed for sorghum cookies to see how long they can be stored and are suitable for consumption

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