Jurnal Info Kesehatan
Vol. 22, No. 1, March 2024, pp. 206-213
P-ISSN 0216-504X, E-ISSN 2620-536X
DOI: *10.31965/infokes.Vol22.Iss1.1569*
Journal homepage: *https://jurnal.poltekkeskupang.ac.id/index.php/infokes*

RESEARCH **Open Access**

Chemical and Physical Quality Biscuits Substitution Pumpkin and Leaves Katuk

Theresia Dewi Kartini Berek[1a], Retno Sri Lestari[1b], Adriyani Adam[1c*]

[1] Department of Nutrition, Poltekkes Kemenkes Makassar, Makassar, South Sulawesi, Indonesia

[a] Email address: thresiadewikartini@poltekkes-mks.ac.id
[b] Email address: retnosrilestari@poltekkes-mks.ac.id
[c] Email address: adriyani@poltekkes-mks.ac.id

Received: 19 March 2024 Revised: 29 March 2024 Accepted: 31 March 2024

Abstract

Dependence on wheat flour is very high, so food diversification efforts must be made to reduce this dependence. Biscuits are a product made from wheat flour as the main ingredient, and they have the potential to be developed using pumpkin and Katuk leaves. This study aims to determine the chemical and physical quality of biscuits substituted for pumpkin, and Katuk leaves. This research was an experimental study with a completely randomized design (CRD), consisting of 3 treatments and one standard treatment, with three repetitions of each treatment, so there were 12 treatment units. Chemical quality includes energy, carbohydrate content, protein, fat, Fe, calcium, vitamin C, β- carotene, and vitamin A. Physical quality is assessed using diameter, thickness, and spread ratio). Data were analyzed using One Way Anova and Krusskal Tests Wallis. The results on the chemical quality of biscuits show a significant effect of substituting pumpkin and Katuk leaves on protein, calcium, zinc, Fe, β- carotene, and vitamin C levels in biscuits. However, fat and carbohydrate levels decreased for energy as the substitution of pumpkin and Katuk leaves increased. The physical quality of biscuits substituted for pumpkin and Katuk leaves shows that the diameter and thickness decrease as the percentage of substitutes for pumpkin and Katuk leaves increases. This situation causes the spread ratio (spread) to increase. This research concludes that substituting pumpkin and Katuk leaves in biscuits significantly affects the chemical and physical quality of the biscuits.

Keywords: Biscuits, Leaves Katuk, Pumpkin Yellow.

Corresponding Author:

Adriyani Adam
Department of Nutrition, Poltekkes Kemenkes Makassar, Makassar, South Sulawesi, Indonesia
Email: adriyani@poltekkes-mks.ac.id

1. INTRODUCTION

The Indonesian government is continuing to promote local food product development to offset the influx of foreign products during the free market era. One of the food products developed is biscuits. Biscuits are a product that is quite popular with the public. The results of research on 1,500 adult consumers in Indonesia and 500 homemakers found that biscuits were the most consumed product (11%) compared to other products (Syana, 2017). Food from processed flour and wheat, states that as much as 13.4% of Indonesia's population consumes biscuits ≥ 1 time per day.

Dependency on wheat flour is very high, so effort in the diversification of food needs to be made to reduce such dependency and dig potency of food. Biscuits are products of bakery dry Products are made by grilling dough made from flour wheat with or without the substitution of oil/fat, with or without the addition of foodstuffs and additional ingredients the food permitted (Badan Standardisasi Nasional, 2011). Potential local food developed as a biscuit product is pumpkin yellow, and Katuk leaves.

Yellow pumpkin (Curcubita moschatai) is a creeping vegetable plant classified as an annual plant that immediately dies after bearing fruit. Pumpkin plants can grow in the lowlands and highlands, with the ideal height between 0-1500 meters above sea level (Pujimulyani, 2012). Yellow pumpkin contains carbohydrates that can reach 70% of the pumpkin puree making, so it can potentially replace some of the use of wheat flour.

Katuk leaves (Sauropus androgynous) in Indonesia grow in the plains at 2,100 meters above sea level. Katuk leaves are rich in iron, provitamin A in form β- carotene, vitamin C, and minerals. Table Composition Food Indonesia (TKPI) includes leaf cough's content proteins, which are tall enough compared to other types of vegetables, which are 6,4gr/100g ingredients. The research results of Sariani et al., (2019) showed a real effect on the organoleptic tests of sago biscuit products with the addition of Katuk 6-leaf flour (Sariani et al., 2019).

The research results of Suryati et al. (2019) show that the best treatment is the addition of puree pumpkin 53% and shell flour egg 7%chicken affects ash content, calcium content, and cookie texture (Suryati, Maherawati, & Hartanti 2019).The research results of Khoirunnisah (2020) showed that 5% Katuk leaf substitution in cookies was acceptable to panelists (Khoirunnisah, 2020).

This research aims to develop biscuits that substitute pumpkin, and Katuk leaves in a different form from biscuit products that have already been studied. Biscuits are substituted with pumpkin puree and fresh Katuk leaves that are blanched and mashed. The development of this biscuit is to make it easier to carry out in the community because there is no need to make pumpkin flour and Katuk leaf flour. Apart from that, this biscuit product can be an alternative for Posyandu cadres in providing local food-based PMT.

2. RESEARCH METHOD

Type of experimental research with completely randomized design (CRD), substitution factors for pumpkin puree (0%, 40%, 45%, 50%) and Katuk leaves (0%, 3%, 4%, 5%) with 3 repetitions, So there are 12 treatment units. The ingredients for making biscuits are wheat flour (125 g, 100 g, 110 g, 120 g), tapioca (25 g), butter unsalted (30 g), egg yolk (8 g), powdered sugar (62.5 g), liquid milk (50 ml), pumpkin puree (0, 60 g, 67.5 g, 75 g), Katuk leaves (0, 4.5 g, 6 g, 8 g), baking powder (2 g), salt (1.5 g) and vanilla (2 g).

The yellow pumpkin is cleaned, cut into pieces and steamed for 15 minutes and mashed until it becomes puree , then roasted at 70ºC for 20 minutes. Katuk leaves are washed and blanched for 2 minutes. Puree Yellow pumpkin, Katuk leaves and liquid milk are mixed and blended for 3 minutes. Then mixed into the biscuit dough. Previously beat the egg yolks for 2 minutes, add powdered sugar, cake ammonia, salt and vanilla, mix well. Enter unsalted butter

stir again. Then add the tapioca and pumpkin puree mixture, add the wheat flour and stir well until it forms a dough that can be rolled out with a noodles maker. Mold the biscuits in a round shape and make a hole in the top. Bake the biscuits for 30 minutes at 130ºC. Then the biscuits are removed, cooled and packaged.

The chemical Quality (Nutrient Analysis). Biscuit nutritional analysis includes energy and protein using the micro method kejldhal, fat using the Shoxlet method, carbohydrates using the Luff method scroll, iron, calcium, zinc each using the Atomic method Absorption Spectrophotometry (AAS), vitamin C and vitamin A using spectrophotometry. The physical quality of the biscuits was assessed by diameter and thickness parameters using a caliper (mm) and ratio distribution (spread ratio) which is the most important parameter for assessing the quality physical biscuits.

The data collected was each tested for data normality. If the data is normal, then a One Way Anova test is carried out with a confidence level of 95% and a further Duncan test. If it is not normal, then test with Krusskal Wallis with a confidence level of 95% and further Mann-Whitney test.

3. RESULTS AND DISCUSSION

The research results show that the energy content of biscuits substituted for pumpkin and Katuk leaves is, on average, in the range of 520.40 - 535.40 Kcal /100 g. The energy content of this biscuit decreased by 2.2% from F3 to F0. Protein levels increased by 48.9%, and the results of the One-Way Test Anova showed that there was a significant effect of substituting pumpkin and Katuk leaves in biscuits (ρ=0.019) on the protein content of biscuits. However, fat and carbohydrate levels decreased (Figure 1).

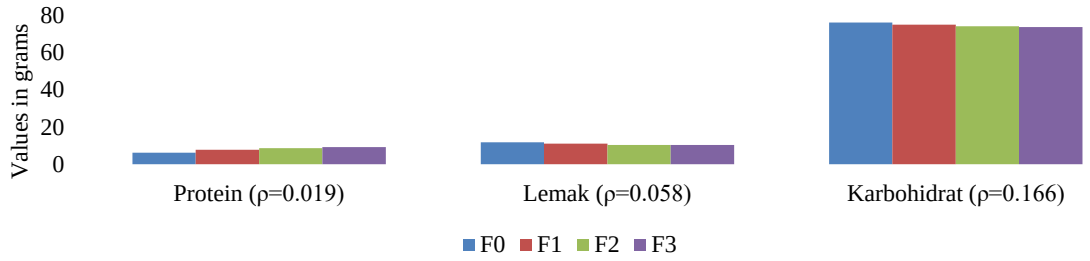

Figure 1. Macronutrient content of biscuits substituted for yellow pumpkin and Katuk leaves.

Micronutrient levels in biscuits substituted for pumpkin and Katuk leaves showed an increasing trend in calcium, zinc, Fe, and β carotene. However, vitamin A and vitamin C levels decreased.

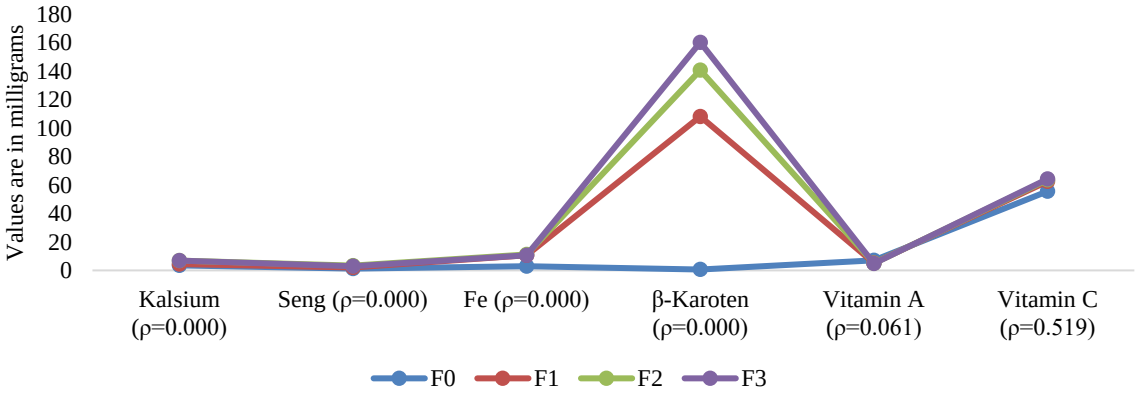

Figure 2. Nutrient Content of Micro Biscuits Substitute for Yellow Pumpkin and Katuk Leaves

The results showed that the physical quality of the biscuits changed in diameter, thickness and spread ratio after being substituted with pureed yellow pumpkin and blanched Katuk leaves (Table 1). The results of the One Way-Anova test show that there is no significant difference in substitution pumpkin and leaves cough on diameter (ρ=0.053), thickness (ρ=0.077) with spreads ratio (ρ=0.280) biscuits.

Table 1 . Physical Quality of Substitute Biscuits for Yellow Pumpkin and Katuk Leaves

Biscuit formula	Thickness (mm)	Diameter (mm)	*Spreads ratio*
F0	5.59±0.60 [a]	51.21±4.02 [a]	8.80±0.50 [a]
F1	4.75±0.80 [a]	46.76±2.33 [a]	9.54±1.51 [a]
F2	5.43±0.51 [a]	47.93±2.78 [a]	8.41±0.31 [a]
F3	4.93±0.40 [a]	47.13±1.74 [a]	10.05±1.25 [a]

Description: The value displayed is the average ± standard deviation. The average value in the same column with a letter different shows a difference significant ρ < 0.05

DISCUSSION

Chemical Quality

Energized is contained in something product determined from content energy material its compiler. Energy on substitute biscuits pumpkin and leaves Katuk experienced a decrease of 2.2% in F3 compared to F0, as pumpkin substitution increased. This reduction is attributed to the energy from the wheat flour in the original biscuits being replaced with less energy from pumpkin (51 Cal/100 g) than from wheat flour (333 Cal/100 g), according to the 2017 Indonesian food composition table. One-Way Test results Anova for biscuit energy, substituting pumpkin and Katuk leaves proved to have no significant effect (ρ=0.189) towards substituting pumpkin and Katuk leaves in biscuits in the three existing formulas.

The energy of biscuits is influenced by the amount of macronutrients contained in the ingredients for making biscuits, such as carbohydrates, fat, and protein. This research shows that the energy content of biscuits has exceeded the SNI No. Standard. 01-2973-1992, namely a minimum of 400 Cal/100 g biscuits. In line with the research by Roifah, Razak, and Suwita, (2019), shows that the energy value of biscuits substituted for green bean flour and tuna fish flour for PMT for pregnant women has decreased (Roifah, Razak, & Suwita, 2019). The research results of Latifah, Rahmawaty, and Rauf, (2019) show no effect of tempeh flour substitution on the energy value of arrowroot flour biscuits.

The increase in protein content in biscuits substituted with pumpkin and Katuk leaves compared to the original biscuits occurred due to the substitution of Katuk leaves and the use of milk. Katuk leaves have a protein content of 6.4 g/100 g, significantly contributing to the biscuits substituted with Katuk leaves per the 2017 Indonesian food composition table. The protein content in these biscuits is according to SNI 2973:2011, which requires a minimum protein content of 5% in biscuits. The protein content of selected biscuits is K1 k because the addition of Katuk leaf flour in making sago biscuits can increase the protein content in sago biscuits (Sariani, Karimuna, & Ansharullah, 2019).

The fat and carbohydrate content in the substitute biscuits for pumpkin and Katuk leaves is in the range of 10.40 g/100 g to 11.83 g/100 g, and this fat content decreases when compared with the original biscuits (Figure 1). One-way test results Anova also shows no significant effect on the fat and carbohydrate content of biscuits rate fat (ρ=0.058) and carbohydrates (ρ=0.166). The low-fat content in biscuits substituted for pumpkin and Katuk leaves are caused by the fat content in pumpkin (0.5 g/100 g) being less than in wheat flour (1.0 g/100 g). Likewise, the levels of carbohydrates in yellow pumpkins are lower Than those in flour wheat. Research by Saputri, Hidayah, & Muttalib, (2021) proves that levels of carbohydrate products

are influenced by the type of materials used , i.e. Substituted carrots for fish Pempek have a rate of lower carbohydrates compared to Pempek control (Saputri, Hidayah, & Muttalib, 2021). The results of this research align with research by Ambarwati, (2020), which shows that the more substitutions there are for pumpkin flour and banana flour, the lower the fat content of *the cookies* (Ambarwati, 2020). The research results of Saputra, Ibrahim, and Faradilla, 2018, also showed the same thing, namely the highest average carbohydrate content of *cookies* in treatment A (100% wheat flour) with an average carbohydrate content of 70.19% and the lowest in treatment B (80% rice bran flour: corn flour 20%) with an average carbohydrate content of 54.73%.

The calcium levels in the biscuits showed a significant effect (ρ=0.000) of substituting pumpkin and Katuk leaves the calcium levels of the biscuits. This is caused by the high calcium levels in Katuk leaves, namely 233 mg /100 g. In line with research by Suhartini et al., 2018, stated that the addition of Moringa leaf flour increased the calcium value of tempeh formula biscuits with the addition of 9% Moringa leaf flour (13.5 g), namely 38.297 mg when compared with 21.356 mg without the addition of Moringa flour. Study Lestari, et al., (2020) stated that Calcium levels in cookies with substitution of Katuk leaves and oatmeal (120 mg) increased compared to cookies without substitution (91 mg).

Zinc levels in biscuits increase and are present, and substitutions for yellow pumpkin and Katuk leaves affect the rate of zinc in biscuits (Figure 2). The increase in zinc levels in biscuits is caused by the zinc levels contained in the biscuit ingredients, namely wheat flour, butter, milk, egg yolk, pumpkin and Katuk leaves. In line with the research by Mumpuni and Khasanah, (2021) which states that a greater proportion of Haruan fish meal and pumpkin seed flour corresponds to a higher zinc content in the biscuits (Mumpuni & Khasanah, 2021). The cookie-baking process also influences the zinc content in biscuit products (Mileiva, Palupi, & Kusnandar, 2017). Biscuits substituted for pumpkin and Katuk leaves were baked at 120ºC for ±27 minutes, and this process also affected the zinc content of the biscuits, which increased as the substitution for pumpkin and Katuk leaves increased.

Fe content in the biscuits is visible in Figure 2. Fe increases to 272.8% when seen from the original biscuits. The analysis results also show a significant effect of substituting pumpkin and Katuk leaves in biscuits (ρ=0.000) on the Fe content of biscuit products. Increased Fe levels This biscuit is caused by the contribution of Fe levels in Katuk leaves, namely as much as 3.5 mg /100 g of material. Putri research et al., (2018) stated that the iron content of Katuk leaf cookies is 1,308 mg /100g (Putri, Almasyhuri, & Mirani, 2018). Likewise, research by Lestari, et al., (2020), shows the average value of iron in cookies with the substitution of Katuk leaves and oatmeal at a concentration of 0%:0%, namely 0.12 mg, and a concentration of 5%:5%, namely 0.14 mg (Lestari, 2020). Similar research results showed significant differences in iron levels in each treatment formulation of Haruan fish flour biscuits, pumpkin seed flour, and pumpkin fruit flour (p=0.001) (Mumpuni & Khasanah, 2021).

Beta-carotene (β- carotene) is an organic compound classified as a terpenoid and the most active pro-vitamin A found in plant foods. Foods containing beta-carotene can increase the body's immunity because of the antioxidant properties contained in beta-carotene (Parwata, Ratnayani, & Listya, 2010). Meanwhile, vitamin A is only found in animal tissue, not plants. However, many plants contain the pigment carotene, which can be converted into vitamin A in the body. Therefore, carotene is called pro-vitamin A because it can be converted into vitamin A (Sanif & Nurwany, 2017). The results showed that the β- carotene and vitamin A levels were inversely related. β- carotene levels increased with increasing presentation of yellow pumpkin and Katuk leaf substitutions, whereas vitamin A levels decreased with increasing substitution of yellow pumpkin and Katuk leaves. If seen from the one-way test results Anova, There is a significant effect of substitution of pumpkin and Katuk leaves in biscuits (ρ=0.000) on β-

carotene levels biscuit products. On the other hand, there was no significant effect of substitution of pumpkin and Katuk leaves in biscuits (ρ=0.061) on the vitamin A levels of biscuit products. The ingredients used in making these biscuits contribute to biscuit products' vitamin A and β- carotene content. This also happened in Kusumawardani et al., (2018), which showed that increasing the amount of composite flour causes the vitamin A content in biscuits to increase along with increasing the amount of composite flour, which uses banana flour with a high vitamin A content (Kusumawardani et al., 2018).

Substitution of pumpkin and Katuk leaves in the biscuits had no real effect (ρ=0.519) against Vitamin C levels in the biscuits. This outcome is due to the easy nature of vitamin C. It is water soluble, though vitamin C levels in yellow pumpkin (2 mg /100 g) and Katuk leaves (164 mg /100 g) are quite high. Apart from that, vitamin C is a vitamin that is not heat resistant, in line with research by Yudhistira, Sari, and Affandi., (2019), which states that the process of roasting and crushing spinach and tomatoes with a blender is a factor that causes vitamin C levels in cookies to decrease (Yudhistira, Sari, & Affandi, 2019).

Quality Physique

Quality physique from biscuits substitution pumpkin and leaves cough show change characteristic physique biscuits seen from average size diameter, thicknes, and ratio spread (*spread ratio*). The diameter and thickness of the biscuit pieces decreased with increasing substitution of pumpkin and Katuk leaves. Baljeet, Ritika, and Roshan, (2010) stated that the diameter and thickness of biscuits are two parameters that always move in opposite directions (Baljeet et al., 2010).

The spread ratio (*spread ratio*) is the most important parameter for assessing biscuit quality (Bose & Shams-Ud-Din, 2010). *Spreads the ratio* is calculated by dividing the diameter by the thickness of the biscuit. Thicker biscuits will have a *lower ratio* compared to thinner biscuits, provided that the diameter of the biscuits is not significantly different. If the diameter of the biscuits differs significantly, then the thicker biscuit has *a spread* higher *ratio.* Nonetheless, the panellists accepted *The high ratio of biscuits* in F1 (9.54). Research by Hussein *et al* ., (2011) and stated that *cookies* that have a higher spread ratio are considered the most desirable or most acceptable. Eissa, Hussein, and Mostafa, (2007) and Niaba, et. al ., (2013) also said that biscuits with a *spread value of A high ratio* are best.

Biscuits in this study were substituted with yellow pumpkin in puree form and Katuk leaves, which had been blanched and crushed (blended). The replacement of wheat flour with pumpkin and Katuk leaves causes the diameter and thickness of the biscuits to decrease as the percentage of substitution for pumpkin and Katuk leaves in the biscuit dough increases. This condition causes the spread value ratio to increase further due to using pumpkin puree and crushed Katuk leaves, which still contain water. This outcome is based on analysis results, which show that the percentage of water content in biscuits substituted for pumpkin and Katuk leaves is between 3.48% and 9.58%.

The physical quality of biscuits substituted with pumpkin and Katuk leaves differs from biscuits substituted with other composite flours. This is caused by substituting pumpkin puree in the paste and Katuk leaves, which are blended in a crushed form, not in the form of flour, so they have lower swelling power than composite flour or other flours. Apart from that, the amount of gluten in the dough decreases with the increasing number of substitutions of pumpkin puree and crushed Katuk leaves, which causes interaction between water and gluten to form a gluten network so that it can withstand gases that expand during the baking process. This finding is different from the results of research by Pratama, Mitha, and Nendra (2017), which found that the addition of banana flour had no real effect on the diameter, thickness and volume of cookie expansion (Pratama, Mitha & Nendra, 2017).

4. CONCLUSION

Biscuits substitution pumpkin and leaves cough was reviewed from quality chemical and physical. In part, big nutrition and size show enhanced quality compared to the original biscuits. For further research, it is recommended to carry out shelf life tests on biscuit products so that the safety of biscuit products can be guaranteed and to test the effect of giving substitute biscuits for pumpkin and Katuk leaves to pregnant women.

ACKNOWLEDGEMENTS

The author would like to express his thanks to 1) the Director of Health Polytechnic Makassar Ministry of Health, which provides the opportunity to obtain research funding; 2) the Chair of the Nutrition Department, who has given recommendations for this research; 3) The research supervisor and ethics team that has been given input for improving this research.

REFERENCES

Ambarwati, R. (2020). Pengembangan Makanan Tambahan Berbasis F100 Dengan Substitusi Tepung Labu Kuning Dan Tepung Pisang. *Journal of Nutrition College*, *9*(2), 121–128. https://doi.org/10.14710/jnc.v9i2.27033

Badan Standardisasi Nasional. (2011). *SNI Biskuit Nomor 2973:2011*. Jakarta: Badan Standardisasi Nasional.

Baljeet, S. Y., Ritika, B. Y., & Roshan, L. Y. (2010). Studies on functional properties and incorporation of buckwheat flour for biscuit making. *International Food Research Journal*, *17*(4), 1067–1076.

Bose, D., & Shams-Ud-Din, M. (2010). The effect of chickpea (Cicer arietinim) husk on the properties of cracker biscuits. *Journal of the Bangladesh Agricultural University*, *8*(1), 147–152. https://doi.org/10.3329/jbau.v8i1.6412

Eissa, H., Hussein, A., & Mostafa, B. (2007). Rheological properties and quality evaluation on Egyptian balady bread and biscuits supplemented with flours of ungerminated and germinated legume seeds. *Polish Journal of Food and Nutrition Sciences*, *57*(4), 487–496.

Hussein, A. M. S., Abd El-Azeem, A. S., Hegazy, A. M., Afifi, A. A., & Ragab, G. H. (2011). Physiochemical, Sensory and Nutritional Properties of Corn-Fenugreek Flour Composite Biscuits. *Australian Journal of Basic and Applied Sciences*, *5*(4), 84–95.

Khoirunnisah, F. M. (2020). Daya Terima Cookies dengan Substitusi Daun Katuk dan Ubi Jalar. *Skripsi*. Jurusan Gizi Politeknik Kesehatan Makassar.

Kusumawardani, H. D., Riyanto, S., Setianingsih, I., Puspitasari, C., Juwantoro, D., Harfana, C., & Ayuni, P. D. (2018). Kandungan Gizi, Organoleptik, dan Umur Simpan Biskuit dengan Substitusi Tepung Komposit (Daun Kelor, Rumput Laut, dan Pisang). *Media Gizi Mikro Indonesia*, *9*(2), 123–138. https://doi.org/10.22435/mgmi.v9i2.543

Latifah, E., Rahmawaty, S., & Rauf, R. (2019). Analisis Kandungan Energi Protein dan Daya Terima Biskuit Garut-Tempe Tinggi Energi Protein sebagai Alternatif Snack untuk Anak Usia Sekolah. *Darussalam Nutrition Journal*, *3*(1), 19–29. https://doi.org/10.21111/dnj.v3i1.3140

Lestari, R. S., Berek, T.D.K., Zakaria, Z., & Jusni, J. (2020). Kadar Mineral Cookies dengan Subtitusi Daun Katuk (*Sauropus andragynus*) dan Oatmeal. *Media Gizi Pangan*, *27*(2), 30–36.

Mileiva, S., Palupi, N. S., & Kusnandar, F. (2017). Evaluasi Mutu Cookies Garut yang Digunakan pada Program Pemberian Makanan Tambahan (PTM) untuk Ibu Hamil. *Jurnal Mutu Pangan*, *4*(2), 70–76.

Mumpuni, C. E., & Khasanah, T. A. (2021). Pengaruh Formulasi Tepung Ikan Haruan, Tepung

Buah dan Biji Labu Kuning pada Biskuit Terhadap Kandungan Gizi dan Daya Terima. *Journal of Nutrition College*, *10*(1), 1–9. https://doi.org/10.14710/jnc.v10i1.28486

Niaba, K. P. V., Gildas, G. K., Avit, B., Thierry, A., Anglade, M. K., & Dago, G. (2013). Nutritional and sensory qualities of wheat biscuits fortified with deffatted Macrotermes subhyalinus. *International Journal of Chemical Science and Technology*, *3*(1), 25-32.

Parwata, I. M. O. A., Ratnayani, K., & Listya, A. (2010). Aktivitas antiradikal bebas serta kadar beta karoten pada madu randu (Ceiba pentandra) dan madu kelengkeng (Nephelium longata L.). *Jurnal Kimia*, *4*(1), 54-62.

Pratama, M. A., & Nendra, H. (2017). Sifat Fisik, Kimia, dan Organoleptik Cookies dengan Penambahan Tepung Pisang Kepok Putih. *The Annual Research Report*, 584–591.

Pujimulyani, D. (2012). *Teknologi Pengolahan Sayur-Sayuran dan Buah-Buahan*. Yogyakarta: Graha Ilmu.

Putri, R. M., Almasyhuri, A., & Miranti, M. (2018). Penambahan Campuran Susu Skim Dan Lemak Pada Cookies Pelancar Asi Tepung Daun Katuk (Sauropus androgynous L. Merr) Terhadap Daya Terima Panelis. *Jurnal Online Mahasiswa (JOM) Bidang Farmasi*, 1(1).

Roifah, M., Razak, M., & Suwita, I. K. (2019). Substitusi tepung kacang hijau (Vigna radiata) dan tepung ikan tuna (Thunnus sp) sebagai biskuit PMT ibu hamil terhadap kadar proksimat, nilai energi, kadar zat besi, dan mutu organoleptik. *Teknologi Pangan: Media Informasi dan Komunikasi Ilmiah Teknologi Pertanian*, 10(2), 135-146. https://doi.org/10.35891/tp.v10i2.1662

Sanif, R., & Nurwany, R. (2017). Vitamin A dan perannya dalam siklus sel. *JKK*, 4(2),83-88.

Saputra, T., Ibrahim, M. N., & Faradilla, R. F. (2018). Pengaruh Penggunaan Tepung Bekatul dan Tepung Jagung (*Zea mays L.*) pada Produk Cookies Makanan Selingan Penderita Diabetes Terhadap Penilaian Organoleptik dan Nilai GI. *J. Sains dan Teknologi Pangan*, *3*(6), 1768–1782.

Saputri, N. E., Hidayah, N., & Muttalib, Y. S. (2021). Komposisi Nilai Gizi Pempek Ikan Tenggiri (*Scomberomorus Commersonii*) dengan Penambahan Wortel (*Daucus carota*). *Poltekita : Jurnal Ilmu Kesehatan*, *15*(2), 143–149. https://doi.org/10.33860/jik.v15i2.488

Sariani, S., Karimuna, L., & Ansharullah, A. (2019). Pengaruh Penambahan Tepung Daun Katuk (*Saoropus Androginus L. Merr*) Terhadap Nilai Organoleptik dan Nilai Gizi Biskuit Berbasis Sagu (*Metroxylon Sagu Rottb*). *J. Sains Dan Teknologi Pangan*, *4*(5), 2425–2437.

Suhartini, T., Zakaria, Z., Pakhri, A., & Mustamin, M. (2018). Kandungan Protein dan Kalsium pada Biskuit Formula Tempe dengan Penambahan Tepung Daun Kelor (*Moringa oleifera*) sebagai Makanan Pendamping ASI (MP-ASI). *Media Gizi Pangan*, *25*(1), 64. https://doi.org/10.32382/mgp.v25i1.63

Suryati, S., Maherawati, M., & Hartanti, L. (2019). Karakteristik Fisikokimia dan Organoleptik Cookies dengan Penambahan Puree Labu Kuning dan Tepung Cangkang Telur Ayam. *FoodTech: Jurnal Teknologi Pangan*, 2(1), 12-25.

Syana.S., A. B. (2017). Produsen, Kenali Kebiasaan Konsumsi Camilan Konsumen Indonesia. *Marketeers*.

Yudhistira, B., Sari, T. R., & Affandi, D. R. (2019). Karakteristik fisik, kimia dan organoleptik cookies bayam hijau (Amaranthus tricolor) dengan penambahan tomat (Solanum lycopersicum) sebagai upaya pemenuhan defisiensi zat besi pada anak-anak. *Warta Industri Hasil Pertanian*, 36(2), 83-95.