Vol. 3 No. 4 Edisi Agustus - Oktober 2026 E. ISSN. 3032-2472
Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

NUTRITIONAL ANALYSIS OF BALI ORANGE PEEL NOODLES SMALL AND MEDIUM ENTERPRISES OF PESANTREN SHOHWATUL IS'AD PANGKEP

ANALISIS GIZI MI KULIT JERUK BALI PADA USAHA KECIL DAN MENENGAH DI PESANTREN SHOHWATUL IS'AD PANGKEP

Fadhila Alifa Ghazani[1*], M. Rachmat Kasmad[2], Guruh Amir Putra[3]

[1*]Universitas Negeri Makassar, Email: fadhilahghazani@gmail.com
[2]Universitas Negeri Makassar, Email: m.rachmat.k@unm.ac.id
[3]Universitas Negeri Makassar, Email: guruh.amirputra@unm.ac.id

*email koresponden: fadhilahghazani@gmail.com

DOI: https://doi.org/10.62567/micjo.v3i4.3330

Abstract

Bali orange peel noodles are an innovative local food product developed by MSME Pesantren Shohwatul Is'ad Pangkep using wheat flour with a 30% substitution of pomelo albedo. Although the product has been produced since 2017, its nutritional composition had not been formally documented. This study aimed to analyze the nutritional composition and energy value of Bali orange peel noodles using proximate analysis based on Indonesian National Standard (SNI) 01-2891-1992. A quantitative descriptive laboratory approach was applied to a dry, original-form noodle product selected by purposive sampling. Moisture, ash, protein, fat, carbohydrate, and crude fiber were analyzed, while energy was estimated using the Atwater conversion factors. The results showed moisture of 8.66 g/100 g, ash 1.58 g/100 g, protein 8.83 g/100 g, fat 0.23 g/100 g, carbohydrate 80.70 g/100 g, and crude fiber 2.82 g/100 g. The calculated energy value was 360.19 kcal/100 g. A 50-g serving provided approximately 175 kcal, and a 280-g package provided six servings. Carbohydrate was the predominant nutrient, whereas fat was the lowest component. The nutritional profile was associated with the raw materials, particularly wheat flour and pomelo albedo, as well as the soaking, steaming, and drying processes. These findings provide scientific documentation that may support nutritional labeling and further development of this local food product.

Keywords : Bali Orange Peel Noodles, Local Food, Proximate Analysis, Nutritional Content, Bali Orange Albedo.

Abstrak

Mi kulit jeruk bali merupakan produk pangan lokal inovatif yang dikembangkan oleh UMKM Pesantren Shohwatul Is'ad Pangkep, dengan menggunakan tepung terigu yang disubstitusi sebesar

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

30% oleh albedo (bagian putih kulit) jeruk bali. Meskipun produk ini telah diproduksi sejak tahun 2017, komposisi gizinya belum pernah didokumentasikan secara resmi. Penelitian ini bertujuan untuk menganalisis komposisi gizi dan nilai energi mi kulit jeruk bali melalui analisis proksimat berdasarkan Standar Nasional Indonesia (SNI) 01-2891-1992. Pendekatan laboratorium deskriptif kuantitatif diterapkan pada produk mi kering yang dipilih menggunakan metode purposive sampling. Parameter yang dianalisis meliputi kadar air, abu, protein, lemak, karbohidrat, dan serat kasar, sementara nilai energi diestimasi menggunakan faktor konversi Atwater. Hasil penelitian menunjukkan kadar air sebesar 8,66 g/100 g, abu 1,58 g/100 g, protein 8,83 g/100 g, lemak 0,23 g/100 g, karbohidrat 80,70 g/100 g, dan serat kasar 2,82 g/100 g. Nilai energi yang diperoleh adalah 360,19 kkal/100 g. Satu porsi seberat 50 g menyumbangkan sekitar 175 kkal, dan satu kemasan seberat 280 g terdiri dari enam porsi. Karbohidrat merupakan komponen gizi utama, sedangkan lemak merupakan komponen dengan kadar terendah. Profil gizi ini dipengaruhi oleh bahan baku terutama tepung terigu dan albedo jeruk bali serta proses perendaman, pengukusan, dan pengeringan. Temuan ini memberikan dokumentasi ilmiah yang dapat mendukung pelabelan gizi serta pengembangan lebih lanjut dari produk pangan lokal tersebut.

Kata Kunci : Mie Kulit Jeruk Bali, Makanan Lokal, Analisis Proksimat, Kandungan Gizi, Albedo Jeruk Bali.

1. INTRODUCTION

Instant and dried noodles are widely consumed because they are practical and easy to prepare. However, conventional noodle products may have an imbalanced nutritional profile, particularly when carbohydrate content is high while protein and dietary fiber are relatively limited. This condition encourages the development of noodle products using local food resources to improve nutritional value and support food diversification.

Pomelo (Citrus maxima) is an important citrus fruit cultivated in Indonesia, including South Sulawesi. Its thick peel consists of the outer flavedo and the inner white albedo. The albedo contains pectin and other cell-wall components and therefore has potential as a functional food ingredient. Previous studies cited in the research report indicate that pomelo peel contains fiber and bioactive compounds, including flavonoids and antioxidants, which support its utilization beyond conventional waste management.

The utilization of pomelo peel as a food ingredient has been implemented by Pesantren Shohwatul Is'ad in Pangkep through the development of Bali orange peel noodles. The product has been produced since 2017 and uses albedo as a 30% substitution component. The product is characterized by a chewy texture, a non-glossy appearance, and a mild citrus aroma without a bitter or astringent taste. Its production also represents an effort to increase the added value of agricultural by-products and support local food innovation.

Despite its continued production, scientific information describing the nutritional composition of the product had not been formally documented. Such information is important for nutritional labeling, product development, consumer information, and marketing. Proximate analysis provides a basic profile of moisture, ash, protein, fat, carbohydrate, and fiber content and is commonly used to evaluate the nutritional characteristics of food products.

Previous studies have demonstrated the usefulness of proximate analysis in evaluating local noodle products. Research on noodles formulated with local ingredients has shown that changes in formulation can alter protein, fat, carbohydrate, fiber, and moisture contents. These findings indicate that laboratory-based nutritional documentation is useful for evaluating the characteristics of innovative local foods.

Based on this background, this study was conducted to determine the nutritional composition and energy value of Bali orange peel noodles produced by MSME Pesantren Shohwatul Is'ad Pangkep. The results are expected to provide scientific documentation of the product and serve as a basis for nutritional information and future product development.

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

2. RESEARCH METHOD

Research Design and Site

This study used a quantitative descriptive design with a laboratory analytical approach. The research was conducted from 10 May to 19 June 2026. Samples were collected at Pesantren Shohwatul Is'ad Pangkep. Moisture and carbohydrate analyses were performed at the Department of Nutrition Laboratory, Faculty of Sports Science and Health, Universitas Negeri Makassar, while ash, protein, fat, and crude fiber analyses were performed at the Makassar Public Health Laboratory.

Sample

The sample was the original dry Bali orange peel noodle product produced by MSME Pesantren Shohwatul Is'ad Pangkep. Sampling used purposive sampling with the criteria that the product was in dry form, produced using the standard formulation, and suitable for consumption.

Product Formulation and Processing

The noodle formulation consisted of wheat flour and 30 g of pomelo albedo pulp per 100 g of dough, with one egg and 200 mL of water. Before use, the albedo was soaked in salt water for three days and the soaking water was replaced daily to reduce bitterness and soften the tissue. The soaked albedo was drained and blended into pulp, mixed with wheat flour and egg, molded into noodles, steamed at 98–100°C for 2–3 minutes, and subsequently oven-dried to reduce moisture and extend shelf life.

Laboratory Analysis

Proximate analysis followed SNI 01-2891-1992. Moisture was determined using the oven-gravimetric method, protein by the Kjeldahl method, fat by gravimetric extraction, carbohydrate by difference, and crude fiber by gravimetric analysis. Laboratory equipment was calibrated before use, and standardized procedures were applied to support measurement validity. The resulting data were processed descriptively using Microsoft Excel.

Energy Calculation

Energy value was calculated using the Atwater conversion factors based on the measured protein, fat, and carbohydrate contents. Protein and carbohydrate were assigned 4 kcal/g and fat 9 kcal/g. The results were expressed per 100 g of product and were subsequently used to estimate the energy contribution of a 50-g serving.

3. RESULT AND DISCCUSSION

Table Nutritional composition of Bali orange peel noodles

Nutritional parameter	Laboratory result (%)	Result per 100 g
Moisture	8.66	8.66 g
Ash	1.58	1.58 g
Protein	8.83	8.83 g
Fat	0.23	0.23 g
Carbohydrate	80.70	80.70 g
Crude fiber	2.82	2.82 g
Energy	–	360.19 kcal

Source: Primary Data, 2026

1. Moisture Content

Moisture content was 8.66 g/100 g. The result was below the maximum moisture value for dried instant noodles cited in the research report, indicating a relatively low moisture level. The moisture content is related to the water added during dough preparation and to water loss during steaming and oven drying. Wheat flour proteins and starch, together with pectin in pomelo albedo, can interact with water during dough formation; however, drying promotes evaporation and substantially reduces the final moisture content. The relatively low moisture content is consistent with the product's dry form and may support its reported storage period of approximately six months to one year.

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

2. Ash Content

Ash content was 1.58 g/100 g. Ash represents the inorganic residue remaining after combustion and is commonly used as an indicator of the total mineral fraction of a food. In this product, minerals may originate from ingredients such as egg and pomelo albedo. The result remained below the maximum ash value cited in the research report for instant noodles, suggesting that the product does not contain an excessive mineral residue.

3. Protein Content

Protein content was 8.83 g/100 g. The principal protein sources were wheat flour and egg, while pomelo albedo contributed less because protein is not its predominant component. The measured value was consistent with the minimum protein requirement for instant noodles cited in the research report. Protein remains nutritionally relevant because it contributes to tissue growth, maintenance, and repair.

4. Fat Content

Fat content was 0.23 g/100 g, the lowest measured macronutrient component. The product formulation did not include added oil, and egg was used primarily as a binder, which limited the contribution of fat to the final product. The low fat value is also consistent with the dry, non-fried processing approach. Based on the BPOM criterion cited in the research report, a product containing no more than 3 g fat per serving may be categorized as low fat; therefore, the measured value supports the low-fat characterization reported in the study.

5. Carbohidrate Content

Carbohydrate content was 80.70 g/100 g and represented the largest proportion of the product. The value was calculated by difference and was therefore influenced by the relatively low moisture, ash, protein, and fat fractions. Wheat flour supplied most of the starch, while pomelo albedo contributed carbohydrate in the form of pectin and other structural carbohydrates. Steaming promotes starch gelatinization, while the drying process reduces water content and consequently increases the calculated proportion of carbohydrate on a mass basis.

6. Crude Fiber Content

Crude fiber content was 2.82 g/100 g. The research report attributes this component mainly to the 30-g pomelo albedo substitution, which contains cell-wall components including cellulose, hemicellulose, lignin, and pectin. The value was reported as higher than the crude fiber range commonly described for ordinary noodles in the research discussion. Soaking, steaming, and drying may alter or remove some soluble components, which can affect the measured fiber fraction. A 50-g serving provides approximately 1.41 g crude fiber, while a 280-g package contains approximately 7.90 g.

7. Energy Value and Serving Size

The energy value was 360.19 kcal/100 g. Using the Atwater factors, protein contributed 35.32 kcal, fat 2.07 kcal, and carbohydrate 322.80 kcal per 100 g. Carbohydrate therefore provided the largest contribution to total energy, consistent with its dominant concentration in the product. Based on the calculation presented in the research report, a 50-g serving provides approximately 175 kcal. A 280-g package can therefore be divided into six servings.

8. Implication For Local Food Development

The findings provide a documented nutritional profile for a locally developed noodle product based on pomelo albedo. The data can support preparation of nutritional information on packaging and provide a baseline for future formulation studies. The product also illustrates a food-diversification approach that uses an agricultural by-product as an ingredient rather than treating it solely as waste.

4. CONCLUSION

1. The moisture content of pomelo peel noodles was 8.66 g/100 g. This value is below the maximum moisture limit (14 g/100 g) for dried instant noodles according to the Indonesian National Standard (SNI); it is therefore classified as low and supports a longer shelf life of the product.

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

2. The ash content of pomelo peel noodles was 1.58 g/100 g. This value remains well below the maximum ash content for instant noodles under SNI (3 g/100 g), indicating that the product is free from excessive mineral contamination, while mineral content derived from pomelo albedo and egg remains preserved.
3. The protein content of pomelo peel noodles was 8.83 g/100 g. This value is relatively low; however, the product can be categorized as low-fat and has the potential for a longer shelf life due to a low risk of oxidative deterioration of fats.
4. The carbohydrate content of pomelo peel noodles was 80.70 g/100 g, representing the largest component in this product. Most of these carbohydrates originate from wheat flour starch, as well as complex carbohydrates in the form of pectin and dietary fiber from pomelo peel albedo.
5. The crude fiber content of pomelo peel noodles was 2.82 g/100 g. This content comes from the inclusion of pomelo albedo, which is rich in cellulose, hemicellulose, and pectin, thereby offering additional health benefits for digestive tract function and blood sugar regulation.
6. The energy value of pomelo peel noodles was 360.19 kcal/100 g. With a serving size of 50 g, the energy contribution per serving is 175 kcal, which meets 35% of the staple food portion recommended in Indonesia's *Isi Piringku* ("My Plate") guideline per meal, and corresponds to 25% of the Recommended Dietary Allowance (RDA) based on a reference intake of 2000 kcal. Each package contains 6 servings.

5. REFERENCES

Abulais, D. M., Yabansabra, Y. R., & Patiung, O. R. (2022). Uji proksimat (kadar air, kadar abu, kadar serat) dan kadar polifenol dari kulit kopi asal Wamena. Jurnal Kimia, 6, 69–74.

Aprianti, D., Rosita, R., & Rate, S. (2023). Substitusi mie berbahan tepung pisang dan tepung daun singkong sebagai pangan fungsional. Jurnal Kesehatan Ilmiah, 8(2), 186–194.

Ayu, K., Kusuma, W., Made, N., & Astuti, W. (2023). Pemanfaatan kulit jeruk bali sebagai dietary fiber untuk pengendalian penyakit radang usus. Jurnal Penelitian dan Pengabdian Masyarakat, 3(6), 2103–2113.

Badan Pengawasan Obat dan Makanan. (2022). Peraturan BPOM RI Nomor 1 Tahun 2022 tentang Pengawasan Klaim pada Label dan Iklan Pangan.

Badan Standardisasi Nasional. (1992). Metode pengujian makanan dan minuman (SNI 01-2891-1992). Jakarta: BSN.

Caffa, I., Proietti, E., Turrini, F., Borgarelli, C., Ferrando, M. R., Formisano, E., et al. (2025). Nutritional aspects of eggs for a healthy and sustainable consumption: A narrative review. Food Science & Nutrition, 13, 1–13.

Christwardana, M., Sri, A., Febriyanti, E., Hadiyanto, H., & Nitia, A. (2023). Proximate analysis and hedonic test on dried noodle with the addition of Spirulina platensis microalgae as a high protein food. Jurnal Sumber Daya Hayati dan Ilmu Lingkungan, 2, 31–38.

Dang, G., Li, J., Yin, C., Wang, W., Zhang, K., Zhong, R., Chen, L., Zhang, H., & Schroyen, M. (2025). Deciphering pectin: A comprehensive overview of its origins, processing, and promising utility. ACS Omega, 10, 1–15.

Fauzah, A. P., Purwani, E. Y., Aji, G. K., Saefudin, A., & Setyani, R. (2025). Analysis of proximate composition and glycemic response of cassava-based rice. Jurnal Gizi Kerja dan Produktivitas, 6, 307–326.

Hadi, N., Piter, P., & Romadan, R. (2024). Identifikasi asupan protein, lemak dan karbohidrat pada mahasiswa agroindustri pangan semester 5. Media Ilmiah Kesehatan Indonesia, 2(3), 69–73.

Hainida, E., Ikram, K., Shah, N. Z., Zamran, W. N., & Nor, N. (2024). The proximate analysis and sensory evaluation of super seed cookies. Jurnal Gizi Pangan, 19, 253–260.

Hafiah, N. A., Lintang, N. S., Octavia, N., Rambe, S. A., et al. (2026). Konsep dan teori nutrisi serta nutrisi yang dibutuhkan tubuh: Systematic literature review. Jurnal Ilmiah, 2, 4494–4503.

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

Hendrasty, H. K., Sugiarto, R., Setyaningsih, S., & Kurniasih, I. (2023). Analysis model approach of the rate change of absorption and cooking loss of dry noodles made from cassava starch. Jurnal Agroekoteknologi Terapan, 4(2), 231–241.

Kementerian Kesehatan RI. (2020). Tabel Komposisi Pangan Indonesia. Jakarta: Kementerian Kesehatan RI.

Kristantri, R. S., Pebriani, T. H., & Sari, W. K. (2024). Karakterisasi nilai gizi tulang ayam ras broiler melalui analisis proksimat. Jurnal Kesehatan Qamarul Huda, 12(2), 7–13.

Kristiandi, K., & Maryam, A. (2021). Analisis kadar air, abu, serat dan lemak pada minuman sirop jeruk. Jurnal Keteknikan Pertanian Tropis dan Biosistem, 9(2), 165–171.

Kusumasari, F. C., Fadhila, T., & Audia, E. A. (2023). Studi kandungan vitamin C pada limbah kulit jeruk pamelo. The First National Conference on Innovative Agriculture 2023, 109–114.

Lembong, E., Djali, M., Subroto, E., & Az-Zahra, N. N. (2026). Physicochemical and sensory characteristics of biscuits with cocoa bean shell flour addition. Jurnal Pangan dan Agroindustri, 2, 99–116.

Li, P., Yao, X., Zhou, Q., Meng, X., Zhou, T., & Gu, Q. (2022). Citrus peel flavonoid extracts: Health-beneficial bioactivities and regulation of intestinal microecology in vitro. Frontiers in Nutrition, 9, 1–13.

Pitaloka, I. M., & Muhlishoh, A. (2024). Analisis kandungan gizi dan organoleptik mie kering substitusi tepung kacang hijau dan tepung daun kelor untuk remaja gizi kurang. Journal of Nutrition College, 13, 105–114.

Saputra, S. A., Suroso, E., Anungputri, P. S., & Murhadi. (2023). The effect of temperature and drying time on the physical, chemical and sensory characteristics of Raja Bulu banana peel flour. Jurnal Agroindustri Berkelanjutan, 2, 86–97.

Sari, R. M., Kisnawaty, S. W., Kurnia, P., & Mustikaningrum, F. (2023). Hubungan antara pengetahuan mengenai label informasi nilai gizi dengan pembelian makanan instan dan snack tinggi kalori pada mahasiswa. Nutrire Diaita, 15(2), 46–53.

Subagio, A., Pranata, F. S., & Swasti, Y. R. (2025). Mi basah dengan substitusi tepung tempe koro benguk dan ekstrak pektin albedo jeruk bali. Jurnal Teknologi Pertanian, 14, 235–246.

Subtropika, B. S. I. P. J. (2023). Pamelo Pangkep: Komoditas unggulan Sulawesi Selatan. Jeruk Subtropika.

Sukainah, A., Marhayati, & Ramli, H. (2025). Karakteristik fisiko-kimia produk olahan dari bunga dan batang lotus. Jurnal Inovasi Hasil Penelitian dan Pengembangan, 5(4), 1421–1430.

Syifa, M. F., Hartati, Y., Telisa, I., & Sihite, N. W. (2025). Daya terima dan analisis proksimat mie berbasis ikan salem, tepung tapioka, tepung wortel daun kelor. Jurnal Pustaka Padi, 4, 57–63.

Taula, M. S. D., Oessoe, Y. Y. E., Sumual, M. F., et al. (2021). Kajian literatur untuk mengevaluasi data kualitas snack bars berdasarkan komposisi kimia. Agrisosioekonomi, 17, 15–20.

WINA. (2024). Data permintaan dan konsumsi mi instan. World Instant Noodles Association.

Witasari, L. D., & Mayangsari, Y. (2021). Pengaruh perendaman kulit jeruk bali dalam larutan garam dan kapur sirih terhadap sifat fisik, kimia, dan sensoris marmalade. Jurnal Keamanan Pangan, 1–2.

Wulandari, P. D., Kawareng, A. T., & Ahmad, I. (2023). Analisis proksimat cookies dari tepung sukun dan tepung buah naga merah. Jurnal Sains dan Kesehatan, 5, 33–39.

Yuliantini, A., Emmawati, E., & Kartika, Y. (2026). Analisis proksimat pada produk pangan fungsional kerupuk jamur tiram coklat dengan variasi metode pemasakan menggunakan minyak dan pasir. 16, 44–58.

Zahro, N. A., & Wahyudi, V. A. (2023). Pengaruh konsentrasi asam klorida dan waktu ekstraksi pada karakteristik pektin kulit jeruk bali. Jurnal Teknologi Makanan dan Ilmu Kehalalan, 6, 58–72.