

Nutritional Analysis and Organoleptic Test of Spinach Dimsum For Pregnant Women

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Abstract: Pregnancy was an important phase that affected the health of both mother and fetus; therefore, fulfilling balanced nutrition needed to be considered to prevent stunting. Spinach contained iron, folic acid, and vitamin A, which played a role in preventing anemia, supporting fetal growth, and maintaining maternal health. To improve acceptability, spinach was processed into dimsum as an innovative local supplementary food that was more attractive and easier for pregnant women to consume. This study aimed to analyze the nutritional content and acceptability of spinach dimsum as a local supplementary food. Nutritional content was analyzed using the Indonesian Food Composition Table, although this calculation was limited and required further laboratory testing. An organoleptic test was conducted using a hedonic scale questionnaire involving 34 pregnant women to assess color, aroma, taste, texture, and appearance. The results showed that each (one piece serving) contained 33.08 kcal energy, 0,61 g carbohydrates, 2.90 g protein, and 2.02 g fat, along with vitamin A (35.83 µg), iron (0.24 mg), and folic acid (8.5 µg). The organoleptic test indicated that most panelists liked the color (82.4%), aroma (73.5%), taste (85.3%), texture (88.2%), and appearance (91.2%). In conclusion, spinach dimsum is suitable for use as a local supplementary food option for pregnant women to help increase their energy and folic acid intake.

1 INTRODUCTION

Pregnancy was an important period of life. A pregnant woman had to prepare herself as well as possible to avoid causing health problems for the mother, the baby, and during the birthing process (Nasriyah & Ediyono, 2023). A pregnant woman was a person who was in the process of conception to continue her lineage. Inside the body of a pregnant woman, there was a fetus that grew and developed in the womb. One of the nutritional problems experienced by pregnant women was the occurrence of stunting in toddlers, which could be prevented

since pregnancy. Stunting was one of the serious public health problems, especially in developing countries such as Indonesia (Meliyana, 2024). Stunting was usually caused by chronic malnutrition, especially during the first 1,000 days of life, which included the period from pregnancy until the child was two years old (Lismasari et al., 2025).

This condition posed a risk of physical developmental disorders in children, which indirectly led to decreased thinking and motor skills as well as reduced work performance (Rasdianah & Makkulawu, 2024). Stunting had long-term impacts on health, cognitive development, and a person's

ability to reach their optimal physical and intellectual potential. It not only affected the physical growth of children, but also had serious effects on cognitive abilities, academic achievement, and productivity in adulthood. Children who experienced stunting tended to have weak immune systems, were more vulnerable to infectious diseases, and were at risk of developmental disorders (Rahman et al., 2023). One of the nutritional problems experienced by pregnant women was stunting in toddlers, which could be prevented from the pregnancy period. According to (Nurdin et al. 2023), stunting began in the first trimester of pregnancy. During the first trimester, the formation of fetal organs and the nervous system occurred; this period was known as the critical phase. This stage was irreversible, during which organ formation took place. Growth disorders in this phase had lifelong negative consequences. Therefore, stunting prevention in children could be analyzed through pregnant women's behavior during the first trimester. Prevention and treatment during pregnancy were among the efforts to break the chain of stunting occurrence in children, one of which was through Supplementary Food -based interventions. Supplementary food interventions had been proven effective in increasing energy intake in pregnant women, reducing the risk of stunting, and providing alternatives for pregnant women who did not like fresh vegetables (Rusnita et al., 2024).

Based on data from SSGI (2024), the prevalence of stunting according to height-for-age (TB/U) reached 37.6% in 2013, decreasing to 19.8% in 2024. The prevalence of stunting in East Java Province reached 15.6%, and in Bondowoso Regency, it reached 13.2%. This was caused by many factors influencing stunting, including nutritional

intake, infectious diseases, birth weight, duration of delivery, exclusive breastfeeding history, vaccination history, maternal knowledge of stunting prevention, local Supplementary Food, and the family's economic status (Qomariyah & Fatmawati, 2024). This indicated the need for a more comprehensive approach, especially Supplementary food as a preventive measure starting from pregnancy.

One strategy to address nutritional problems such as stunting was to carry out specific interventions such as Supplementary food using local food ingredients (Purbaningsih & Ahmad Syafiq, 2023). Efforts that could be made to prevent stunting included utilizing locally sourced Supplementary food through spinach dimsum. This activity aimed to provide Supplementary food based on local foods by analyzing the nutritional content of spinach dimsum given to pregnant women. The main ingredient used in spinach dimsum was spinach.

Spinach was a leafy vegetable plant that had long been known and favored by all levels of society. Spinach had a soft texture necessary for facilitating digestion. In addition, spinach contained important nutrients for stunting prevention (Azuir et al., 2024). Spinach was rich in vitamin A, vitamin C, iron, and fiber. Its nutritional content could help increase energy needs, especially for early stunting prevention in pregnant women (Ardiansyah et al., 2025). According to Ayuwardani et al. (2025), spinach had many diverse benefits as it was a source of calcium, vitamin A, vitamin C, vitamin E, fiber, beta-carotene, and contained very high iron. Supplementary food was additional food that did not replace the main meals. Locally sourced obtained from the surrounding area contained carbohydrates, animal protein, plant protein, vitamins, and minerals. Local

food could be used to reduce stunting because it was relatively inexpensive and easy to obtain, which was one of the advantages of using local food (Meilasari & Wiku Adisasmito, 2024). However, one important aspect of the successful implementation of was community acceptance of the provided food products. Therefore, an organoleptic test was needed, including taste, aroma, texture, color, physical appearance, and preference value. Organoleptic assessment was carried out using a rating scale from very good to very bad, with criteria observed including taste, aroma, color, texture, and physical appearance to ensure that local food-based could be accepted by pregnant women and had the potential to be used sustainably (Herawati et al., 2024). The organoleptic test was conducted on local food-based, namely spinach dimsum, which was given to pregnant women as participants.

2 METHOD

This community service program was carried out in Pakisan Village, Tlogosari Subdistrict, Bondowoso Regency, from June to July 2025, involving 34 pregnant women. The method used in this community service was a participatory approach. The participatory approach was important in implementing community service activities. This approach was based on the active involvement of the community throughout the entire program process, from planning to evaluation. Through active participation, the community did not only function as an object but also as a subject that played an important role in determining the direction and outcomes of the service program (Zunaidi, 2024).

The event began with the preparation of Supplementary food based on local food, in the form of spinach dimsum. The components used included 1 sheet of wonton skin (5 g), 1 bunch of spinach (50 g), ¼ kg of chicken breast (250 g), 2 tablespoons of wheat flour (20 g), 3 carrots (30 g), 2 stalks of scallions (10 g), 1 tablespoon of cornstarch (10 g), and 2 chicken eggs (30 g). The preparation process was carried out step-by-step, starting with preparing the ingredients, which included thoroughly washing all vegetables, boiling the spinach for about 5 minutes, peeling and grating the carrots, and finely chopping the scallions. The chicken was washed, cut into small pieces, and ground. Next, the vegetable ingredients were mixed with the ground chicken, eggs, wheat flour, and cornstarch, then stirred until evenly combined. The mixture was then placed on a wonton skin, one tablespoon each, shaped like a small bowl with the top left open, and arranged in a preheated steamer. The steaming process lasted for about 15–20 minutes until cooked, indicated by a firm filling. Once cooked, the spinach dimsum was ready to be served, and its nutritional content was calculated to increase energy intake for pregnant women. Nutritional analysis was then conducted using the Indonesian Food Composition Table to determine the energy value, macronutrients, and micronutrients in the spinach dimsum. The final step was the organoleptic test, aimed at evaluating the acceptance level of the spinach dimsum among pregnant women. The panelists consisted of 34 pregnant women who participated in the program. The evaluation was carried out by serving the spinach dimsum to the panelists, who then filled out a hedonic test questionnaire. The scale used was from 1–5, with 1 meaning “dislike very much” and 5 meaning “like

very much.” The aspects evaluated included color, aroma, taste, and texture.

3 RESULT

Nutritional Content of Spinach Dimsum

Table 1 Results of the Nutritional Content Analysis of Spinach Dimsum

Number	Nutrient	Nutrient Content	Per Recipe (150 g)	Per Serving (25 g)	Per Piece (5 g)	Unit
1.	Energy	825.2	825.2	165.04	33.08	kcal
2.	Carbohydrates	15.1	15.1	3.02	0.61	g
3.	Protein	73.3	73.3	14.66	2.90	g
4.	Fat	50.7	50.7	10.14	2.02	g
5.	Fiber	29	29	5.8	1.16	g
6.	Folic Acid	85.3	85.3	17.05	8.5	µg
7.	Vitamin A	895.8	895.8	179.16	35.83	µg
8.	Vitamin B1 (Thiamine)	0.5	0.5	0.1	0.02	mg
9.	Vitamin B2 (Riboflavin)	0.9	0.9	0.18	0.03	mg
10.	Vitamin B3 (Niacin)	24	24	4.8	0.96	mg
11.	Vitamin C	19.3	19.3	3.86	0.77	mg
12.	Iron (Fe)	6.2	6.2	1.24	0.24	mg
13.	Zinc	5.4	5.4	1.06	0.21	mg
14.	Calcium	167.5	167.5	33.5	6.7	mg
15.	Phosphorus	552.6	552.6	110.52	22.10	mg
16.	Magnesium	89.9	89.9	17.98	3.5	mg
17.	Sodium	368	368	73.6	14.6	mg
18.	β-carotene	4024	4024	804.8	160.96	mcg

Based on the table above, the nutritional content analysis using the Indonesian Food Composition Table showed that one recipe of spinach dimsum weighing 150 g, which produced 50 pieces, contained 825.2 kcal of energy. Consuming one serving (5 pieces) contributed 165.04 kcal, while one piece contained 33.08 kcal, thus helping to meet the energy needs for fetal growth. The amount of carbohydrates per serving was 3.02 g, serving as a source of energy to support the development of fetal organs and tissues. Protein content was high, at 14.66 g/serving, which was essential for the formation of body cells,

muscle tissue, and fetal organs. Fat, amounting to 10.14 g per serving, functioned as an energy reserve for fetal growth. Fiber content reached 5.8 g per serving, contributing to maternal digestive health, thereby optimizing nutrient absorption for the fetus. Folic acid, at 17.05 µg/serving, served to prevent neural tube defects in the fetus, while vitamin A (179.16 µg/serving) and β-carotene (804.8 mcg/serving) contributed to the formation of visual organs, cell growth, and improved fetal immune function. B-complex vitamins (B1, B2, B3) supported energy metabolism and the development of the fetal

nervous system, while vitamin C (3.86 mg/serving) played a role in collagen synthesis and enhanced iron absorption. Iron content of 1.24 mg/serving was crucial for red blood cell formation and ensuring oxygen supply to the fetus. Zinc (1.06 mg/serving) was involved in cell division and fetal brain development, while calcium (33.5 mg/serving) and

magnesium (17.98 mg/serving) contributed to bone and tooth formation. Phosphorus (110.52 mg/serving) played a role in energy metabolism and tissue synthesis, while sodium (73.6 mg/serving) functioned to maintain fluid balance essential for fetal growth.

Organoleptic Test Spinach Dimsum

After completing the preparation of the spinach dimsum, an organoleptic test was conducted to assess the level of panelist acceptance. The results of the organoleptic test were as follows :

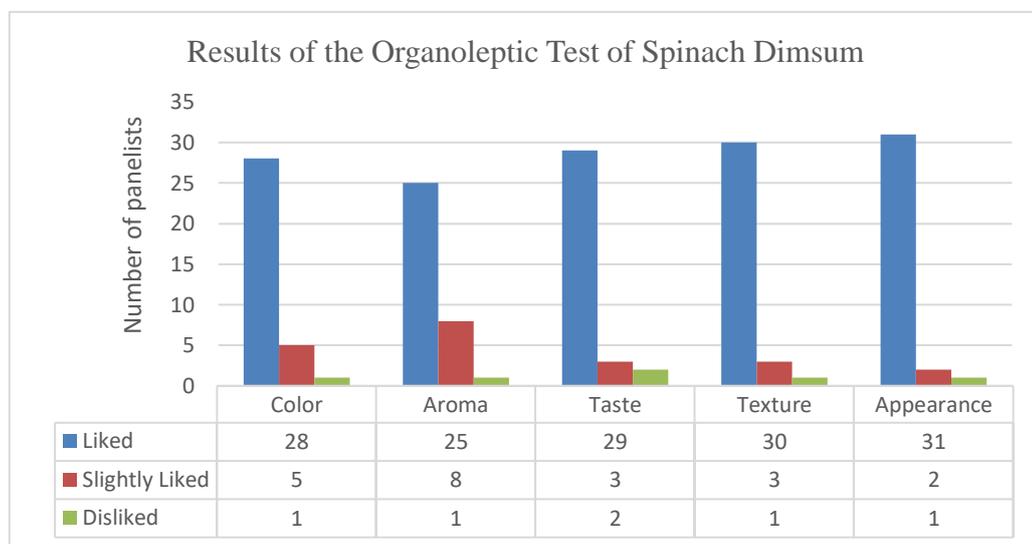


Chart 1 Results of the Organoleptic Test of Spinach Dimsum

Based on the graph above, the results of the organoleptic test showed that spinach dimsum was liked by the majority of panelists in all aspects. In terms of color, 28 (82,4%) people indicating that the product's color was quite appealing. Aroma was liked by 25 people (44.1%) showing that the aroma was appetizing. Taste received evaluations from 29 (85,3%) people indicating that taste was the main attraction. Texture with 30 people (88,2%) stating

that they liked showing that the texture suited the panelists' preferences. Appearance was considered attractive by 31 (91.2%) individuals indicating that the appearance was suitable for consumption

4 DISCUSSION

Supplementary Food was an effort to increase nutrient intake; however, it was not intended to replace the main meals usually consumed daily

(Kusuma & Achyar, 2025). Locally sourced Supplementary food was a strategic intervention in addressing stunting (Sukarta & Rosmawaty, 2025). In this activity, the local food-based Supplementary Food was in the form of spinach dimsum. This product was introduced as a nutritious alternative menu that was easy to prepare, economical, and favored by the community. The nutritional composition of the dimsum, which included animal protein from chicken and eggs, vitamins and minerals from vegetables (spinach and carrots), as well as carbohydrates from flour, made it one of the alternatives for stunting prevention based on local food Supplementary Food. The spinach dimsum developed in the local food based Supplementary Food program contained 33.08 kcal of energy per one pieces. This amount was sufficient as an additional energy intake of around 8–10% of the daily energy needs of pregnant women. This additional energy intake was crucial, considering that the energy needs of pregnant women increased with the progression of pregnancy to support fetal growth, physiological changes in the mother's body, and preparation for childbirth.

Research conducted by Rotua et al. (2022) stated that the modification of sardine spinach dimsum had a higher energy content, namely 203.74 kcal/serving, but excessive energy consumption had the potential to increase the risk of fat accumulation and cholesterol levels in pregnant women. This risk could trigger excessive metabolic effects such as insulin resistance, hyperlipidemia, and an increased likelihood of gestational diabetes and preeclampsia. Therefore, spinach dimsum with lower energy content was recommended because it provided adequate energy without creating an excessive

metabolic burden. This was also supported by research conducted by Isro'aini et al. (2025), who stated that developing local food based Supplementary Food for pregnant women had proven to increase food acceptance and meet maternal nutritional needs to support a healthy pregnancy, effectively preventing stunting. Another study conducted by Rasdianah & Makkulawu (2024) showed that moringa leaf biscuits as Supplementary Food tended to focus only on plant-based protein and iron, thus their nutritional support for the fetus was less optimal if used as the sole source of Supplementary Food. In contrast, spinach dimsum provided a more complex nutritional profile by including proteins, carbohydrates, vitamins, and minerals essential for fetal development. Protein of 2.90 g per piece supported the formation of body tissues, muscles, and fetal organs, while folic acid of 8.5 µg per piece played a crucial role in preventing neural tube defects. Iron of 1.24 mg per serving helped maintain oxygen supply to the fetus, thereby reducing the risk of oxygen deficiency, while calcium (6.7 mg per piece) and magnesium (3.5 mg per piece) contributed to the formation of bones and teeth. The vitamin A and β-carotene content in spinach dimsum also supported the development of the visual organs and the immune system of the fetus. With its balanced nutritional composition, spinach dimsum was superior as Supplementary Food compared to similar products that focused only on one or two nutrients.

Research conducted by Putri et al. (2024), who created Supplementary Food in the form of spinach nuggets, showed that spinach dimsum had a superior nutritional profile compared to spinach nuggets. In terms of protein content, spinach dimsum contained 14.66 g per serving (25 g), whereas spinach nuggets

only contained plant-based protein. Considering that nuggets generally contained flour as a binding ingredient, their protein content tended to be lower compared to dimsum, which obtained its protein from chicken. In terms of fiber, spinach dimsum contained 5.8 g per serving, whereas spinach nuggets, though recognized as a source of fiber, had lower fiber content due to the dominance of flour. The processing method affected the nutritional quality. Spinach nuggets processed by frying could reduce fat-soluble vitamins such as A, D, E, and β -carotene due to oxidation at high temperatures. In contrast, spinach dimsum processed by steaming better preserved essential micronutrients such as vitamin A, vitamin C, β -carotene, folic acid, iron, zinc, calcium, and magnesium. Therefore, dimsum contributed to maintaining digestive health and preventing constipation. In addition to making local food based Supplementary Food, an organoleptic test was also conducted to assess whether the Supplementary Food produced was suitable for consumption.

The organoleptic test was a method to capture human perception of food products through the senses, including sight, smell, taste, touch, and hearing. Its purpose was to assess the sensory quality of the product, including appearance, aroma, taste, and texture, as well as to ensure that the product met consumer preferences and expectations (Nur Solikin, Ardina Tanjungsari, 2024). The organoleptic test of spinach dimsum was conducted to assess panelists' acceptance of the product in terms of color, aroma, taste, texture, and appearance. In terms of color, most panelists expressed interest, with 28 (82.4%) stating they liked it and 5 (14.7%) stating they slightly liked it, indicating that the appearance of the dimsum was considered attractive. However, 1 (2.9%) person

disliked it entirely, suggesting room for improvement such as optimizing the color combination to make it more appealing. In terms of aroma, most panelists gave positive ratings, with 25 (73.5%) stating they liked it and 8 (23.5%) stating they slightly liked it, although 1 (2.9%) disliked it, suggesting that more balanced and milder seasonings could improve aroma appeal. In terms of taste, the dimsum received very positive ratings, with 29 (85.3%) stating they liked it and 3 (8.8%) stating they slightly liked it. Only 2 (5.9%) panelists disliked it, indicating that taste was the most dominant factor influencing the acceptance of local Supplementary Food. For texture, 30 (88.2%) stated they liked it and 3 (8.8%) stated they slightly liked it, while only 1 (2.9%) disliked it. This showed that the soft and chewy texture of the dimsum met consumer expectations. Meanwhile, in terms of appearance, most panelists gave ratings of 31 (91.2%) liking it and 2 (5.9%) slightly liking it, with only 1 (2.9%) disliking it, indicating that spinach dimsum had significant visual appeal. Overall, the results of the organoleptic test showed that spinach dimsum, as an innovative local food product, was well accepted by most panelists in terms of taste, texture, appearance, color, and aroma. Only a small number of panelists expressed dissatisfaction, suggesting that minor improvements in color and aroma could enhance the overall quality of the product. The results of the organoleptic test in this study were consistent with research by Falah AS et al. (2023), which showed that adding green spinach to catfish dimsum still resulted in good organoleptic acceptance, especially in terms of taste and appearance favored by panelists.

Research by Rotua et al. (2023) reported that tempe spinach nuggets with balanced formulation

achieved high preference levels in aroma and texture, thereby increasing local food acceptance. However, the results of this study were not entirely consistent with the findings of Ningtias & Sinaga (2024), who stated that increasing the percentage of spinach in chicken dimsum actually reduced panelist preference for color, aroma, and taste. This was due to the appearance of a dark green color caused by chlorophyll content and the dominance of vegetable taste that overshadowed the natural flavor of chicken. Spinach dimsum, however, was more accepted because the green color produced looked fresh and not too dark, making it visually attractive without giving an impression of being undercooked or bitter. Its smooth and elastic texture suited consumer preferences for light snacks that were easy to chew, including for pregnant women who often experienced nausea or digestive problems. The aroma produced was not too strong because of the balanced use of spices, thus avoiding triggering the olfactory sensitivity often experienced by pregnant women. In addition, its high nutritional content with moderate energy levels allowed consumers to feel satisfied without worrying about increasing metabolic burden or obesity risk.

5 CONCLUSIONS

This study successfully developed a local Supplementary food program in the form of spinach dimsum. Spinach dimsum (one piece serving) contained 33.08 kcal energy, 0,61 g carbohydrates, 2.90 g protein, and 2.02 g fat, along with vitamin A (35.83 µg), iron (0.24 mg), and folic acid (8.5 µg), which synergistically supported the health of pregnant women. Carbohydrates served as the main source of

energy, protein played a role in the formation of fetal tissues and organs, and fat functioned as an energy reserve and supported fetal brain development. In addition, spinach dimsum was also rich in vitamin A (179.16 µg), iron (1.24 mg), and folic acid (17.05 µg). Vitamin A played a role in the development of the fetal visual organs and immune system, iron supported the formation of hemoglobin and the supply of oxygen to the fetus, while folic acid was essential for preventing neural tube defects and supporting cell division during fetal growth. The analyse nutrition although this calculation was limited and required further laboratory (proximal) testing. The results of the organoleptic test showed that spinach dimsum was more accepted by panelists compared to several other Supplementary Food products due to its attractive color combination, balanced taste, desirable texture, and mild aroma. This proved that spinach dimsum was superior not only in nutritional value but also in sensory qualities, thus it could increase energy and folic acid intake through Supplementary Food consumption by pregnant women.

6 REFERENCES

- Ardiansyah, D., Arya, M. R., Adinda, P. A., Rifa'i, A., & Prasetyo, G. A. (2025). Innovation in Spinach Cultivation as a Form of Food Self-Sufficiency to Reduce Stunting Rates in Sukosari Village. *Academic Journal of Community Service*, 3(1), 32–36.
- Ayuwardani, N., Puspita, S., Nurmaulawati, R., & Nurfitriawatie, N. (2025). Counseling on Stunting Prevention through Supplementary Feeding in the Form of Vegetable Pudding and Distribution of Iron Tablets in Tulung Village, Saradan Madiun. *Journal of Volunteers and*

- Community Service REDI*, 2(1), 19–22.
<https://doi.org/10.69773/sxe98v18>
- Azuir, F., Qadri, A., Mullianda, Rizka, A., Septira, H. N., Putri, A. S., Krisnanda, D. A., & Noviza. (2024). Overcame Toddler Stunting Problems through Supplementary Feeding (PMT) of Spinach Nuggets in Labuhan Kera Village, Gunung Meriah Subdistrict, Aceh Singkil Regency. *Ampoen Journal: Acceleration of Independent Learning in Community-Oriented Service*, 2(2), 979–979.
- Falah AS, S., Aryani, A., & Ratnasari, I. (2023). The Effect of Adding Green Spinach (*Amaranthus tricolor L.*) on the Nutritional Quality of Catfish (*Pangasius sp.*) Dimsum. *Juvenil: Scientific Journal of Marine and Fisheries*, 4(1), 51–56.
<https://doi.org/10.21107/juvenil.v4i1.19025>
- Herawati, J., Thohiron, M., Toheri, T., & Dhinata, Y. P. (2024). Conducted Instant Organoleptic Test of Ginger from Three Ginger Varieties (*Zingiber officinale*). *Journal of Applied Plant Technology*, 3(1), 66–77.
<https://doi.org/10.30742/5pcdd809>
- Isro'aini, A., Setiyaningsih, F. Y., Permatasari, R. D., & Sulistyawati, H. (2025). Created Supplementary Feeding (PMT) Preparations for Pregnant Women Based on Local Food Ingredients to Prevent Stunting. *Abdi Medika Journal: Journal of Community Service*, 5(1), 24–32.
- Kusuma, M., & Achyar, K. (2025). Examined the Relationship Between Local Supplementary Feeding (PMT) and Height Gain in Stunted Toddlers Aged 24–59 Months in the Working Area of Jeruklegi II Health Center in 2024. *Health News Journal*, 17(1), 220–234.
<https://doi.org/10.58294/jbk.v17i1.264>
- Lismasari, F. E., Salsabila, T. A., Sitorus, K. N. B., & Trisnawati. (2025). Educated Pregnant Women on Nutrition to Prevent Stunting at the Rosella Posyandu, Pelambaian Village. *Jdistira*, 5(2), 278–284.
<https://doi.org/10.58794/jdt.v5i2.1273>
- Meilasari, N., & Adisasmito, W. (2024). Accelerated the Reduction of Stunting Through Supplementary Feeding (PMT) Using Local Food: A Systematic Review. *Indonesian Journal of Health Promotion Publication (MPPKI)*, 7(3), 630–636.
<https://doi.org/10.56338/mppki.v7i3.4924>
- Meliyana, E. (2024). Discussed Exclusive Breastfeeding, Complementary Feeding, and Stunting. *STIKes Medistra Indonesia*, 1(2), 57–78.
- Nasriyah, N., & Ediyono, S. (2023). Analyzed the Impact of Nutritional Deficiency in Pregnant Women on the Risk of Stunting in Infants. *Journal of Nursing and Midwifery Sciences*, 14(1), 161–170.
<https://doi.org/10.26751/jikk.v14i1.1627>
- Ningtias, M. S. I., & Sinaga, K. (2024). Studied the Effect of Adding Spinach on the Organoleptic Quality and Fiber Content of Chicken Dimsum. *Journal of Innovation Research and Knowledge*, 4(6), 3775–3782.
- Nur, S., & Tanjungsari, A. P. (2024). Conducted Organoleptic Test of Various Meatballs as Consumer Solutions in Banyakan District, Kediri Regency. *Agriovet Journal*, 6(2), 188–194.

- Nuridin, N., Sunandar, Ariyana, Rismawati, & Rahmiani. (2023). Prevented Early Stunting Through Counseling and Monitoring for Pregnant Women in Pattimpa Village, Ponre Subdistrict, Bone Regency. *J-ABDI: Journal of Community Service*, 3(2), 183–188. <https://doi.org/10.53625/jabdi.v3i2.5761>
- Purbaningsih, H., & Syafiq, A. (2023). Assessed the Effectiveness of Supplementary Feeding (PMT) Using Local Food on Weight Gain in Toddlers. *Indonesian Journal of Health Promotion Publication (MPPKI)*, 6(12), 2550–2554. <https://doi.org/10.56338/mppki.v6i12.4206>
- Putri, B. A. S., Febrianti, D., Sari, D. N., Suciati, D. W., Rohman, F. S., Indriyani, L., Putri, M. D. A., Koyyimah, N. D., Wardati, W. S., & Kurniawan, M. U. (2024). Reduced Stunting Rates in Ambulu Village, Jember Regency Through the Making of Spinach Nuggets. *Aspirations: Publication of Community Service and Activities*, 2(5), 32–38.
- Qomariyah, V. A., & Fatmawati, S. (2024). Analyzed Medical History as a Contributing Factor to Stunting in Children Aged 1–5 Years. *Journal of Health Sciences Cluster*, 4(2), 18–38.
- Rahman, A., Zulkifli, Z., Andika, A., Khadijah, S., Dwi, I., & Nana, C. (2023). Implemented Community Education Program on Awareness and Knowledge of Stunting in Meunasah Rayeuk Village, North Aceh. *Journal of Community Service for the Nation*, 1(10), 2423–2433. <https://doi.org/10.59837/jpmba.v1i10.529>
- Rasdianah, N., & Makkulawu, A. (2024). Trained Community in Processing Moringa Leaf Biscuits as Complementary Food to Prevent Stunting in Mananggu Village, Boalemo Regency, Gorontalo. *Kumawula: Journal of Community Service*, 7(1), 198. <https://doi.org/10.24198/kumawula.v7i1.50124>
- Rotua, M., Megawati, M., Yulianto, Y., & Weisdhania, N. W. (2023). Analyzed the Acceptance of Temyam Nuggets (Tempeh and Green Spinach) as Snacks for Elementary School Children. *Padi Literature Journal (Center for Food and Nutrition Studies)*, 2(1), 22–27. <https://doi.org/10.55382/jurnalpustakapadi.v2i1.465>
- Rotua, M., Putri, S. K., Podojoyo, P., & Sriwiyanti, S. (2022). Examined the Acceptance of Modified Sardines and Spinach in Dimsum as a High-Calcium Supplementary Food. *Journal of Complementary in Health*, 2(1), 54–58. <https://doi.org/10.36086/jch.v2i1.1492>
- Rusnita, K., Khasanah, U., & Darlis, K. (2024). Empowered Community in Tackling Stunting: Nutrition Education Programs for Pregnant Women and Toddlers. *Window of Community Dedication Journal*, 5(2), 40–47.
- SSGI. (2024). *Indonesian Nutrition Status Survey*.
- Sukarta, A., & Rosmawaty. (2025). Handled Stunted Toddlers Through Supplementary Feeding (PMT) Based on Local Food in Lalabata Rilau Urban Village. *Journal of Community Service Based on Health (JPMBK)*, 2(1), 1–5.
- Zunaidi, A. (2024). *Community Service Methodology* (U. S. Hidayatun, Ed.; 2nd ed., Vol. 2). Putra Adi Dharma Foundation.