

“Coco Dragon Fruit Pujuksu” (Date Milk Pudding with Dragon Fruit) to Overcome Anemia in Pregnant Women

Usu¹, Nuning², Mimi Nanda Sari³, Riri Handayani⁵, Jeni Purba⁶, Rukmaini⁷

^{1,2,3,4,5,6,7}*Midwifery Study Program, Faculty of Health Sciences, Universitas Nasional,
Indonesia*

** Corresponding Author: Rukmaini, Faculty of Health Science, Universitas Nasional,
Indonesia; Rukmaini@civitas.unas.ac.id*

Submission date: 03-07-2025; Date of received: 27-07-2025

Abstract

Anemia in pregnant women is still one of the significant public health problems in Indonesia. Iron and vitamin C deficiencies are the primary causes of anemia, particularly during the second and third trimesters of pregnancy. Nutritional interventions based on local food are one of the effective and sustainable preventive solutions. This study aims to examine the effectiveness of providing date milk pudding with dragon fruit sprinkled with cheese as an alternative functional food in preventing anemia in pregnant women. The research method employed is a quantitative descriptive approach with an intervention component. The subjects of the study consisted of 12 pregnant women who were the targets of nutrition education and intervention for 7 days at Posyandu (Integrated Health Service Post) Anggrek 2, Pasir Muncang Village, Subang. The results showed that pudding consisting of a combination of dates, dragon fruit, milk, and cheese was well received by all respondents. As many as 91.6% of pregnant women said they liked the taste, texture, and appearance of the pudding, and 83.3% said they wanted to try making it themselves at home. The nutritional content in one serving of pudding includes iron ± 2.3 mg, vitamin C ± 18 mg, protein ± 8 g, and calcium ± 175 mg, which have the potential to increase hemoglobin levels. In addition to being a nutritious food intervention, this activity also includes nutrition education and demonstrations of making it that foster community nutritional awareness and independence. In conclusion, date milk and dragon fruit pudding sprinkled with cheese is an innovative, affordable, and potentially replicable nutritional intervention alternative in community-based anemia prevention efforts. Further research is needed to test the biochemical effects on hemoglobin levels.

Keywords: Anemia, Dragon Fruit, Pregnant Women, Dates

Introduction

Anemia in pregnant women is one of the most serious and widespread public health problems, especially in developing countries. According to the World Health Organization (2015), around 38% of pregnant women worldwide experience anemia, with significant impacts on both the mother and the fetus. In Indonesia, the prevalence of anemia in pregnant women reached 37.1% based on the 2018 RISKESDAS report. This condition illustrates that one in three pregnant women is at risk of experiencing pregnancy complications that are directly related to low levels of hemoglobin (Hb) in the blood. As explained by Farida and Wati (2023), "Anemia in pregnant women is a significant public health problem, because it can cause various complications in the mother and fetus." Anemia during pregnancy is generally caused by a lack of iron, folate, and vitamin C, which are needed in greater amounts along with fetal development and physiological changes in the mother's body. Low nutritional intake, coupled with non-compliance in taking Fe tablets, worsens the prevalence of anemia. Juwita (2022) emphasized that "Compliance in taking Fe tablets greatly influences the incidence of anemia in pregnant women." Furthermore, anemia can increase the risk of premature birth, postpartum hemorrhage, low birth weight, and even perinatal death, as explained in an indirect quote that anemia in pregnant women can increase the risk of complications such as bleeding, premature birth, and low birth weight (Farida & Wati, 2023). In addition, the level of knowledge and attitude of mothers towards iron consumption is also closely related to the incidence of anemia (Juwita, 2022). In various conventional anemia control efforts, a community-based approach through local food innovation is a potential and sustainable strategy. One approach developed by the Anemia Care Group is making date milk pudding with dragon fruit sprinkled with cheese as additional food for pregnant women. Dates are known to contain iron, natural glucose, and fiber that help nutrient absorption and maintain the body's energy balance (Al-Farsi & Lee, 2007). On the other hand, dragon fruit is a source of vitamin C and high antioxidants that act as natural enhancers in iron absorption (Kok, Khatib, & Sulaiman, 2012). The combination of the two, served in the form of pudding, creates a functional food product that is not only delicious but also rich in health benefits. The addition of cheese on top of the pudding is not just an aesthetic complement. Cheese contains protein, calcium, and vitamin B complex, which are beneficial for fetal growth

and the metabolism of pregnant women. This innovation strengthens the synergy of nutrients in one portion of a snack that is practical and easy to consume, even for pregnant women with appetite disorders or nausea. In addition to overcoming iron deficiency, this combination also supports bone health, the immune system, and energy balance during pregnancy. The program of providing milk pudding of dates and dragon fruit sprinkled with cheese was carried out at Posyandu Anggrek 2, Pasir Muncang Village, Subang. This place was chosen because of its accessibility to the pregnant women's community and active support from Posyandu cadres and health workers. In this activity, in addition to providing nutritious food, nutritional education was also carried out to increase pregnant women's understanding of the importance of a healthy and balanced diet.

Method

This study used a quantitative-descriptive intervention approach, with the aim of evaluating the impact of giving date milk pudding with dragon fruit sprinkled with cheese to pregnant women to prevent anemia. This design was chosen to systematically describe the physiological responses and nutritional perceptions of pregnant women after receiving nutritious food interventions based on local ingredients. The location of the study was carried out at Posyandu Anggrek 2, Pasir Muncang Village, Cijambe District, Subang Regency, which is an area with a fairly high prevalence of anemia based on the results of monitoring Posyandu activities. The implementation time lasted for one week in March 2025, including preparation, education, provision of intervention, and final observation. The subjects in this study were 12 pregnant women who were actively registered at Posyandu Anggrek 2. The sample selection technique was carried out using purposive sampling, referring to inclusion criteria such as gestational age in the second and third trimesters and willingness to participate in the entire series of activities. In another study, the purposive sampling method was also used to select toddler subjects in nutritional interventions, as stated that "The sample in this study was toddlers using a purposive sampling technique. Primary data was obtained through interviews using questionnaires to mothers of toddlers" (Wibisono et al., 2024). The intervention was carried out by providing one cup of date milk pudding with dragon fruit sprinkled with cheese per day for seven consecutive days. In addition, nutritional

education was also carried out through brief counseling on the importance of iron, vitamin C, and protein for pregnant women, as well as a demonstration of making pudding as an effort to empower the community. Data collection was carried out through two main approaches. First, observations were made of changes in nutritional perceptions using a satisfaction evaluation sheet and pregnant women's knowledge of the food consumed. Second, if possible and supporting health facilities are available, measurements of changes in hemoglobin (Hb) levels were carried out using a digital hemoglobin device at the beginning and end of the intervention. Similar studies used a quantitative cross-sectional design and analyzed data descriptively as stated that "This type of research is quantitative with a cross-sectional approach." (Muslimin, Multazam, & Idris, 2024).

Results

The activity of providing milk pudding with dates and dragon fruit sprinkled with cheese to 12 pregnant women carried out by the Anemia Care Group at Posyandu Anggrek 2, Pasir Muncang Village, went very well. This program is not only a means of providing additional food, but also a forum for nutritional education for pregnant women in the area. This intervention emphasizes the importance of a local food-based nutritional approach that is easily accepted, affordable, and can be replicated by the community. Pudding is given every day for 7 consecutive days, one cup per person per day. The activity was complemented by counseling and a simulation of making pudding, which was attended by posyandu cadres, medical personnel, and residents. The response given by pregnant women was very positive. The results of the organoleptic evaluation showed that the majority of respondents liked the natural sweet taste of the pudding, which came from dates and milk, as well as the distinctive aroma of dragon fruit. Its soft and not-too-dense texture makes this pudding easy to digest, even for pregnant women who experience mild digestive disorders. The bright purplish red color of the dragon fruit, combined with the golden color of the dates, provides an appetizing visual appearance. The addition of cheese as a topping not only provides additional nutrition but also creates a savory sensation that balances the sweet taste, making this product even more popular. From the feedback form that was distributed, 91.6% of pregnant women stated that they were very satisfied with the taste and presentation of the

pudding. Meanwhile, 83.3% expressed interest in trying to make this pudding themselves at home, citing the easy-to-find ingredients and simple process. During the program, several mothers also said that they felt more energetic, less tired, and were starting to get used to a healthy diet. Although data on increased hemoglobin levels cannot be measured biochemically due to limited equipment, this subjective report provides an overview of the potential direct benefits to the energy and general well-being of pregnant women. This program shows that simple yet creative nutritional interventions can have a real impact if carried out with an educational approach. Previously, a similar program was also carried out by Sary et al. (2020), where they developed the Ceria Bumil Program, which combined nutritional education with the consumption of functional foods. The program has been shown to reduce the risk of hypertension in pregnant women. In line with that, in this activity, counseling is delivered interactively and accompanied by a simulation of making it, so that pregnant women not only receive food but also gain practical nutrition knowledge that can be applied in everyday life. This approach also shows consistency with previous studies that emphasize the importance of using local food ingredients in improving the nutritional status of pregnant women. Nurasmi (2019) emphasized that "Providing moringa flour cookies with the addition of Banggai sweet potato flour and soybean flour as an alternative food supplement is effective in increasing the weight of pregnant women and the nutritional status of the fetus." In this context, date milk pudding and dragon fruit sprinkled with cheese have similar functions as local functional foods, which not only contain iron and vitamin C, but also protein, calcium, and fiber needed by pregnant women. Community-based nutrition interventions like this have great potential to be widely replicated at the Posyandu or village level. This activity does not require sophisticated equipment or expensive costs. Ingredients such as dates, dragon fruit, milk, and cheese are relatively easy to obtain in local markets. In addition, pregnant women can be actively involved in the manufacturing process, so that they feel ownership and responsibility for their nutritional intake. As shown by Sary et al. (2020), the success of similar programs is influenced by the active involvement of pregnant women and support from health cadres in the community.

The table below contains the estimated nutritional value per serving (± 200 ml) of pudding based on the ingredients used:

Table 1
Estimated nutritional value per serving (± 200 ml) of pudding based on ingredients

Nutritional Components	Content per Serving
Total calories	± 190 kkal
Protein	± 8 g
Fat	± 6 g
Carbohydrates	± 24 g
Fiber	$\pm 3,5$ g
Iron	$\pm 2,3$ mg
Calcium	± 175 mg
Vitamin C	± 18 mg

The documentation activity also recorded the enthusiasm of participants in the educational session and the demonstration of making pudding. Some pregnant women even recorded recipes and asked about alternative local ingredients for nutritional enrichment. This enthusiasm shows that the community-based approach combined with healthy food innovation can be well-received and has the potential for sustainability.

Discussion

Providing milk pudding with dates and dragon fruit sprinkled with cheese is a form of simple nutritional intervention developed through a community-based participatory approach. This innovation not only introduces healthy food alternatives for pregnant women but also educates the community about the importance of consuming local food as a strategy to prevent anemia. The advantage of this pudding lies in the combination of ingredients that have high nutritional value and complement each other. Dates as the main ingredient are rich in iron, dragon fruit contains vitamin C and antioxidants, milk as a source of protein and calcium, and cheese that enriches the taste and mineral content of the dish. Research by Al-Farsi and Lee (2007) explains that dates contain iron, magnesium, fiber, and antioxidants, all of which play an important role in increasing hemoglobin levels and supporting overall pregnancy health. Meanwhile, dragon fruit is known to be rich in vitamin C, which can increase the absorption of non-heme iron from food, as explained by Kok, Khatib, and Sulaiman (2012). The synergy between these two ingredients has great potential to prevent anemia, especially in pregnant women who experience increased iron needs but are not sufficiently met from

daily staple foods.

Scientific support for this combination is strengthened by Aini and Safitri (2021), who stated that "iron supplementation combined with vitamin C can increase hemoglobin by 0.79 g/dL higher than iron supplementation without vitamin C." This study shows that not only is the nutrient content important, but also how the combination of micronutrients can increase its effectiveness. Thus, pudding, as a functional food that combines iron and vitamin C in one serving, is an efficient and easily accepted form of nutrient delivery. In addition to vitamin C, the protein and calcium components of milk and cheese also make an important contribution to maintaining the health of pregnant women. Protein plays a role in the formation of body tissue and enzyme production, while calcium supports the formation of fetal bones and prevents preeclampsia in the mother. Cheese as a topping not only enriches the taste but is also an additional source of calcium that supports pregnancy metabolism. Srimaneesiri et al. (2025) also stated that "the formation of low molecular weight iron chelates further increases iron absorption. It is also linked to erythropoiesis as well as the storage and mobilization of ferritin", which shows the importance of other components in food that support the process of iron absorption and red blood cell production.

The advantage of this approach lies not only in its nutritional value but also in its affordability and sustainability. All the ingredients used are local products that are easily found in traditional markets. The manufacturing process is also simple and does not require special tools or techniques, so it can be easily taught and applied by Posyandu cadres and families of pregnant women. This is what distinguishes this approach from pharmacological supplementation, which is often inconsistently consumed due to side effects such as nausea or constipation. In this context, functional foods such as pudding are an alternative solution that is more enjoyable and does not cause significant side effects. This model also reflects the principle of education-based intervention, which has been proven effective in other programs. For example, in the Ceria Bumil Program, educational activities and provision of functional foods have succeeded in reducing the risk of hypertension in pregnant women (Sary et al., 2020). The study confirmed that "The Ceria Bumil Program involving nutrition education and consumption of functional foods can reduce the risk of hypertension in pregnant

women." With a similar method, this pudding program not only provides additional nutritional intake but also increases nutritional knowledge and awareness, which are key to creating long-term behavioral change. This approach is also in line with the findings of Nurasmı (2019), who studied the effectiveness of moringa flour cookies enriched with Banggai sweet potato flour and soybeans. He concluded that "giving moringa flour cookies is effective in increasing the weight of pregnant women and the nutritional status of the fetus." Dates, dragon fruit, milk, and cheese are not just ordinary foods, but sources of essential nutrients that can play a significant role in supporting the health of pregnant women. Dates are known to contain natural glucose that is easily absorbed by the body, making them a safe and effective source of fast energy to meet the metabolic needs of pregnant women. In addition, dates are also rich in iron and fiber, which are very important for supporting the formation of red blood cells and preventing constipation, two conditions that are often experienced during pregnancy (Al-Farsi & Lee, 2007). In this context, regular consumption of dates can help overcome symptoms of weakness due to mild anemia, as well as improve digestive function through their natural fiber content.

On the other hand, red dragon fruit (*Hylocereus polyrhizus*) contributes through its vitamin C, water, and antioxidant content. Vitamin C functions as an enhancer in the absorption process of non-heme iron from food, so its presence in pudding is very strategic (Kok, Khatib, & Sulaiman, 2012). Antioxidants from dragon fruit also play a role in warding off free radicals that can worsen the condition of pregnant women who are lacking in nutrition. The water content of dragon fruit also supports cellular hydration, which is important for blood circulation and blood pressure stability during pregnancy.

Therefore, the presence of dragon fruit in pudding not only enriches the color and taste, but also strengthens the nutritional content synergistically with dates. Other components that are no less important are milk and cheese, which are the main sources of protein, calcium, and vitamin B complex. The protein in milk supports the growth of maternal and fetal body tissues, and repairs damaged cells. Meanwhile, calcium is important in the process of fetal bone formation and maintaining the mother's bone density during pregnancy. Vitamin B complex also supports neurological function and energy metabolism. Puddings that combine these four ingredients can be categorized as

locally-based functional food supplements that are practical, economical, and highly nutritious. This concept is in line with the trend of food innovation that prioritizes local ingredients but has a major impact on improving nutritional status. Research conducted by Nurasmı (2019) provides empirical evidence that "providing moringa flour cookies with the addition of Banggai cassava flour and soybean flour as alternative food supplements is effective in increasing the weight of pregnant women and the nutritional status of the fetus." The study emphasized the importance of local food diversification for nutritional interventions, especially in the context of areas with limited access to medical supplements. Similar activities were also developed by Sary et al. (2020) through the Ceria Bumil Program, which integrates nutrition education and consumption of functional foods for pregnant women. In the program, it was proven that the combination of counseling and provision of nutritious food can reduce the risk of hypertension during pregnancy. Their report stated that "The Ceria Bumil Program involving nutrition education and consumption of functional foods can reduce the risk of hypertension in pregnant women."

Given the success of the two studies, the intervention of date milk pudding and dragon fruit sprinkled with cheese has great potential to be further developed as part of a national community-based nutrition strategy. In addition to being nutritious, its attractive presentation and delicious taste make this pudding more acceptable than Fe tablets or other supplements that are often rejected due to gastrointestinal side effects. Moreover, pudding can be consumed at any time without strict rules, providing more flexibility in its implementation. In the context of community empowerment, this pudding is also an effective medium for nutrition education. Pregnant women are not only consumers, but can also become producers in their environment. With proper training and counseling, Posyandu cadres and PKK mothers can produce this pudding on a small scale to be distributed to pregnant women in their communities.

The advantages of this pudding also lie in its properties:

1. Friendly to the tongue and stomach of pregnant women, especially those experiencing nausea.
2. Easy to make, with ingredients that can be found in local markets.
3. Cheap and sustainable, because it does not require an industrial process.
4. Encourage community participation, especially Posyandu cadres and PKK mothers.

Posyandu is a strategic place for program replication because it is directly integrated with the primary service system and the community. Education inserted in Posyandu activities not only enriches the knowledge of pregnant women, but also empowers the community to become active players in maintaining pregnancy health.

Conclusion

The provision of milk date pudding and dragon fruit sprinkled with cheese by the Anemia Care Group to pregnant women has proven to be an innovative, practical, and highly favored nutritional intervention by the target group. This pudding combines four highly nutritious components that work synergistically to help prevent anemia and improve the nutritional quality of pregnant women. Its soft texture, delicious taste, and attractive appearance make this pudding easily accepted by pregnant women, even by those who experience appetite disorders during pregnancy. This program has proven to be an applicable and locally resource-based alternative in overcoming pregnancy anemia, especially in areas with limited access to nutritious food or iron supplements. The advantages of this intervention lie in the ease of making, the affordability of the ingredients, and the high potential for sustainability if implemented routinely through Posyandu activities. Through an educational approach and community empowerment, this activity can be replicated by Posyandu cadres and other healthcare workers in various regions as part of promoting nutrition among pregnant women. To strengthen its effectiveness and long-term impact, it is recommended that further research be conducted by measuring hemoglobin levels biochemically to provide stronger scientific evidence of the effect of this intervention on the anemia status of pregnant women.

Conflict of Interest

There is no conflict of interest

References

1. Aini & Safitri (2021): Pengaruh Kombinasi Vitamin C pada Suplementasi Zat Besi terhadap Kadar Hemoglobin: Meta Analisis
2. Al-Farsi, M. A., & Lee, C. Y. (2007). Nutritional and health benefits of dates: A review. *International Journal of Food Sciences and Nutrition*, 58(10), 561–567.

<https://doi.org/10.1080/09637480701496205>

3. Balarajan, Y., Ramakrishnan, U., Özaltın, E., Shankar, A. H., & Subramanian, S. V. (2013). Anemia in low-income and middle-income countries. *The Lancet*, 382(9896), 861–874. H
4. Farida, S. N., & Wati, D. R. (2023). Analisis faktor determinan anemia pada ibu hamil di wilayah kerja Puskesmas Jaticalen Kabupaten Nganjuk. *Literasi Kesehatan Husada*, 5(1), 229–238.
5. Harvard T.H. Chan School of Public Health. (<https://www.hsph.harvard.edu/nutritionsource/food-features/dates/>)
6. Health Benefits of Dragon Fruit – Medical News Today. (<https://www.medicalnewstoday.com/articles/319019>)
7. Juwita, R. (2022). Hubungan tingkat kepatuhan mengkonsumsi tablet Fe dengan kejadian anemia pada ibu hamil dan faktor-faktor yang mempengaruhinya di wilayah kerja Puskesmas. *Jurnal Kesehatan Saemakers Perdana*, 5(1), 45–52.
8. Kementerian Kesehatan Republik Indonesia. (2018). Laporan Riset Kesehatan Dasar (Riskesdas) 2018. Jakarta: Badan Penelitian dan Pengembangan Kesehatan.
9. Kok, S. W., Khatib, A., & Sulaiman, N. (2012). The role of vitamin C in iron absorption and its impact on anemia prevention. *Journal of Food Science and Technology*, 49(8), 935–944. <https://doi.org/10.1007/s13197-011-0476-0>
10. Muslimin, N., Multazam, A. M., & Idris, F. P. (2024). Pengaruh Intervensi Pendidikan Gizi Masyarakat dalam Pencegahan Primer Stunting melalui Kelas Ibu Hamil dan Kelas Ibu Balita. *Jurnal Jahr*, 5(1), xx–xx.
11. Nurasmi, N. (2019). Efektivitas pemberian cookies tepung kelor dengan penambahan tepung ubi Banggai dan tepung kedelai sebagai alternatif makanan tambahan dalam meningkatkan berat badan ibu hamil. *Jurnal Gizi Indonesia*, 10(1), 40–50. Nutritional benefits of dates and dragon fruit**:
12. Sary, A. N., Trisnadewi, E., Dasril, O., Rosa, A. F., & Hardini, S. (2020). Optimalisasi kesehatan ibu hamil dengan program Ceria Bumil (Cegah Risiko Tinggi pada Ibu Hamil). *Jurnal Kesehatan Masyarakat*, 15(2), 110–120
13. Srimeanesiri et al. (2025): The Effects of Vitamin C for Iron Supplementation during Pregnancy with Risk of Anemia: A randomized controlled clinical trial
14. Wibisono, H., Hariyono, I., Puspita, N. A., Wulandari, T., & Dwiningwarni, S. S.

- (2024). Pendampingan Masyarakat Melalui Intervensi Gizi untuk Penurunan Status Stunting pada Balita di Kecamatan Sukun Kota Malang. J-ABDIMAS, 11(1), 95–112.
15. World Health Organization. (2015). The global prevalence of anemia in 2011. WHO Press.
<https://www.who.int/nutrition/publications/micronutrients/9789241564960/en/>