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THE EFFECTIVENESS OF INTERVENTION DUJHA JERKY (SWEET POTATO LEAVES–CHICKEN LIVER) ON HEMOGLOBIN LEVELS OF PREGNANT WOMEN IN THE WORKING AREA OF SUKARAMI PUBLIC HEALTH CENTER, LAHAT

Efektivitas Pemberian Dendeng DUJHA (Daun Ubi Jalar Hati Ayam) terhadap Kadar Hemoglobin Ibu Hamil di Wilayah Kerja Puskesmas Sukarami Lahat

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ABSTRACT

Background: Anemia in pregnancy remains a significant public health concern including in the working area of Sukarami Public Health Center, Lahat Regency, where the prevalence reached 38.8% in 2024. Iron deficiency is the leading cause of this condition. One alternative effort to increase hemoglobin levels is by providing iron-rich functional foods such as DUJHA jerky (a combination of sweet potato leaves and chicken liver). Objective: to determine of effectiveness of DUJHA jerky consumption on hemoglobin levels among pregnant women. Methods: This study employed a pre-experimental design with a one- group pretest-posttest approach. a total of 32 pregnant women were selected through total sampling. The assessments included organoleptic testing, nutrient content analysis, hemoglobin level measurement, and evalution of macro and micronutrient intake before and after the intervention. Data were analyzed using a paired t-test. Results: DUJHA jerky formula 2 was most preferred by panelists. The nutritional content per 100 g includes: energy 512.9 kcal, protein 20.6 g, fat 34.69 g, carbohydrate 32.2 g, iron 14.1 mg, and vitamin C 0.8 mg. The average hemoglobin level increased from 10.1 g/dL to 10.7 g/dL post-intervention.Statistical analysis showed a significant difference (p=0.000), indicating effectiveness. Conclusion: DUJHA jerky is effective in increasing hemoglobin levels in pregnant women and has the potential to be developed as an alternative functional food to prevent anemia.

Keyword: *anemia; DUJHA jerky; hemoglobin; iron; pregnant women*

ABSTRAK

Latar Belakang: Anemia pada ibu hamil masih menjadi permasalah kesehatan yang serius, termasuk di wilayah kerja Puskesmas Sukarami Kabupaten Lahat, dengan prevalensi anemia mencapai 38,5% pada tahun 2024. Defisiensi zat besi menjadi penyebab utama kondisi ini. Upaya alternatif untuk meningkatkan kadar hemoglobin salah satunya melalui pemberian pangan tinggi zat besi seperti dendeng DUJHA (Daun Ubi Jalar Hati Ayam). Tujuan: Mengetahui efektivitas perberian Dendeng DUJHA terhadap peningkatan kadar hemoglobin ibu hamil. Metode: Penelitian ini menggunakan desain *pre-eksperimental* dengan pendekatan *one group pretest-posttest.* Sampel diambil menggunakan total sampling sebanyak 32 ibu hamil. Penilaian meliputi uji organoleptik, analisis kandungan zat gizi, pengukuran kadar hemoglobin, serta asupan zat gizi sebelum dan sesudah intervensi. Data dianalisis menggunakan uji t-dependent. Hasil: Dendeng DUJHA formula 2

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paling disukai panelis. Kandungan gizi per 100 g: energi 512,9 kkal; protein 20,6 g; lemak 34,69 g; karbohidrat 32,2 g; zat besi 14,1 mg; vitamin C 0,8 mg. Rata – rata kadar hemoglobin meningkat dari 10,1 g/dl menjadi 10,7 g/dl setelah intervensi. Uji statistik menunjukan nilai p = 0,000 (p<0,05), menandakan terhadap perbedaan signifikan. Kesimpulan: Pemberian Dendeng DUJHA efektif meningkatkan kadar hemoglobin pada ibu hamil. Produk ini berpotensi sebagai alternatif pangan fungsional dalam pencegahan anemia.

Kata Kunci: anemia; dendeng DUJHA; hemoglobin; ibu hamil; zat besi.

INTRODUCTION

One of the dangerous conditions frequently experienced by pregnant women is anemia. Maternal mortality in developing countries is closely related to the occurrence of anemia during pregnancy. Anemia in pregnancy is a condition in which the number of red blood cells or hemoglobin (Hb) levels in the body are lower than normal, namely <11 g/dL at the beginning of pregnancy. Anemia during pregnancy is a problem that greatly affects the quality of human resources and reflects the socio-economic welfare of a community. In both developed and developing countries, most pregnant women experience anemia during pregnancy (WHO, 2019).

Anemia in pregnant women poses significant risks for both the mother and the fetus. For the mother, anemia may lead to shortness of breath, palpitations, hypertension, preeclampsia, sleep disorders, miscarriage, and an increased risk of bleeding before or during childbirth, which may even lead to maternal death (Asmin et al., 2021). For the fetus, anemia can result in intrauterine growth retardation (IUGR), preterm birth, congenital abnormalities, low birth weight (LBW), and an increased risk of fetal death in utero (Tanziha et al., 2019).

According to WHO (2019), the global prevalence of anemia in pregnant women is 36.9%**.** The prevalence of anemia among pregnant women in several regions is 47.8% in Asia**,** 45.8% in Africa**,** 23.5% in Europe**,** and 18.9% in the Americas**.** Based on the *Indonesia Health Survey (SKI) 2023*, the prevalence of anemia in pregnant women in Indonesia is 27.7%**.** This figure shows a decrease compared to the *Basic Health Research (Riskesdas) 2018* data, which reported a prevalence of 48.9%**.**

According to the 2023 Government Agency Performance Report of the South Sumatra Provincial Health Office, the prevalence of anemia in pregnant women in South Sumatra is 4.73%**,** while in Lahat Regency it is 18.43% (Dinkes Sumsel, 2023).

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Data from Sukarami Public Health Center (Puskesmas Sukarami) in Gumay Talang District, Lahat Regency, showed that in 2023, the coverage of pregnant women experiencing anemia was 40.1% (Sukarami Nutrition Profile, 2023). In 2024**,** the coverage of anemia among pregnant women at Sukarami Health Center was 38.5%**.** These data indicate that, compared to the previous year, there has not been a significant decrease.

Iron deficiency is the most common cause of anemia in pregnant women because the need for iron increases as gestational age progresses. To address anemia, the government has implemented a program of providing iron tablets or *tablet tambah darah* (TTD) to pregnant women. However, this effort has not yielded satisfactory results. Various reasons contribute to pregnant women not consuming iron tablets, including nausea, black stools, unpleasant taste, and others. Therefore, alternative efforts are needed to prevent anemia in pregnant women, one of which is providing supplementary foods high in iron (Fe) (Podojoyo et al., 2021).

Sweet potato (*Ipomoea batatas*), a member of the *Convolvulaceae* family, is a food crop with strong potential for supporting dietary diversification. Its leaves are particularly rich in micronutrients, containing 6.4 mg of iron per 100 g (TKPI, 2020). Several studies have demonstrated the hematinic benefits of sweet potato leaves for pregnant women. Migiarti et al. (2024) reported that consuming sweet potato leaf decoction increased hemoglobin levels by 1.2 g/dL, rising from 10.1 g/dL to 11.3 g/dL among pregnant women with mild anemia. Similarly, Yuliastuti et al. (2022) found that the consumption of purple sweet potato leaves effectively improved hemoglobin levels in first-trimester pregnant women, with an N-Gain value of 1.056 (>0.7), indicating high effectiveness. Consistent findings were documented by Hartati et al. (2024), who observed progressive increases in hemoglobin levels—from 9.7 g/dL at the first visit to 9.9 g/dL at the second and 10.5 g/dL at the third visit—following sweet potato leaf consumption.

Chicken liver, on the other hand, acts as a physiological iron store, thereby containing a high concentration of bioavailable iron. It provides 8.99 mg of iron per 100 g (TKPI, 2020), and its minerals are more readily absorbed due to the lower

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presence of mineral-binding compounds (Santosa et al., 2016). Kurnia et al. (2022) demonstrated that supplementation with steamed sponge cake enriched with chicken liver, mung bean flour, and sweet potato significantly increased hemoglobin levels in anemic pregnant women, with a mean rise of 2.42 g/dL in the intervention group compared to 1.30 g/dL in the control group. Both sweet potato leaves and chicken liver can therefore serve as potent dietary sources of iron—6.4 mg and 15.8 mg, respectively. Importantly, iron derived from animal sources (heme iron) exhibits a markedly higher absorption rate (~37%) than plant-based non-heme iron **(**~5%**)** (Purwandi et al., 2024).

Jerky is a traditional Indonesian processed meat product typically made from beef, but it can also be prepared using other ingredients such as goat meat, pork, or game animals like deer. In this study, a jerky product was developed using a combination of sweet potato leaves and chicken liver as the primary raw materials, processed to resemble conventional jerky. The selection of these two ingredients was based on previous research indicating that sweet potato leaves and chicken liver contain high levels of iron and have the potential to increase hemoglobin concentrations. Therefore, the combination of these ingredients was developed as an alternative iron-rich food that is more readily accepted by the community without reducing its nutritional value. Based on this rationale, the researchers attempted to produce DUJHA Jerky, formulated from sweet potato leaves and chicken liver as a source of iron, and to assess the effectiveness of DUJHA jerky consumption on hemoglobin levels among pregnant women in the working area of Sukarami Health Center, Lahat Regency.

METHODS

Design, Setting, and Timeline

This study employed a pre-experimental design using a One-Group Pretest–Posttest Design**,** which essentially involves a single intervention group. The research process began with organoleptic testing of the DUJHA jerky (sweet potato leaves–chicken liver jerky) product, conducted in February 2025 at the Nutrition Department campus of Poltekkes Kemenkes Palembang. Subsequently, the DUJHA jerky underwent nutrient content analysis in March 2025 at the laboratory of PT Saraswanti Indo

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Genetech, located in Bogor. The study then proceeded with an intervention among pregnant women, carried out in April 2025 over a 14-day period of DUJHA jerky administration in the working area of Sukarami Public Health Center, Gumay Talang District, Lahat Regency.

Subject Selection

The population in this study consisted of all pregnant women residing in the working area of Sukarami Public Health Center, Gumay Talang District, Lahat Regency, South Sumatra. This study employed total sampling, a sampling technique in which all members of the population are included as the sample—resulting in 32 pregnant women in the Sukarami Health Center working area. The rationale for using total sampling is that the population size is relatively small, i.e., fewer than 100 individuals (Sugiyono, 2013).

Sample selection was then carried out using purposive sampling, a technique in which participants are chosen based on specific considerations determined by the researcher to ensure that the selected subjects possess particular characteristics relevant to the study (Dana, 2020). The sample in this study included respondents who met the predetermined inclusion and exclusion criteria.

Types and Methods of Data Collection

The types of data in this study consisted of primary data and secondary data. Primary data were obtained directly by the researchers through measurements and direct interviews with respondents. These primary data included: respondent identity, hemoglobin levels before and after the intervention, organoleptic test results, nutrient analysis of DUJHA jerky, and respondents' nutrient intake data. Secondary data consisted of general information about the research area, obtained from the Sukarami Health Center in Lahat.

Data collection procedures were as follows: on the first day of the study, anemia screening was conducted by measuring hemoglobin levels, followed by a 1×24-hour dietary recall of food intake prior to the administration of DUJHA jerky. The intervention then continued with the provision of DUJHA jerky as a snack, given once daily at 100 g per day for 14 days. On the 14th day, another 1×24-hour dietary recall was conducted, and hemoglobin levels

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were re-measured by healthcare personnel using the Easytouch GCHB device.

Materials

The initial stage of this study involved determining the DUJHA jerky formulation by adjusting the composition and developing several formulas with varying ratios of sweet potato leaves to chicken liver. The formulation process was conducted to observe the effect of different proportions on the product's nutritional content and characteristics. Table 1 presents the ingredients used for one 100g serving of DUJHA jerky.

Table 1. Composition of Ingredients for DUJHA Jerky Production

Ingredients	Treatment			
	F0	F1	F2	F3
Chicken liver (g)	0	55	75	75
Red sweet potato leaves (g)	75	75	75	55
Chicken eggs (g)	15	15	15	15
Wheat flour (g)	20	20	20	20
Tapioca flour (g)	10	10	10	10
Garlic (g)	2	2	2	2
Cooking oil (g)	10	10	10	10

DUJHA Jerky Production Process

The production of DUJHA jerky begins with the preparation of the mixture. First, red sweet potato leaves are finely blended using a chopper, followed by blending the chicken liver in the same manner. Once both ingredients are finely processed, they are placed into separate containers. Next, garlic, coriander, and salt are blended until smooth. In a mixing bowl, combine the blended sweet potato leaves, blended chicken liver, sliced spring onions, chicken eggs, and the blended seasoning mixture, then mix until evenly combined. After that, gradually add the flour into the mixture while stirring, ensuring all ingredients are thoroughly and evenly mixed.

The second stage is steaming the mixture. Prepare a baking tray and pour the jerky mixture into it. Then, prepare a steamer pot by adding water and heating it over a stove until the water boils. Once boiling, place the tray containing the jerky mixture into the steamer and steam for approximately 20–30 minutes until fully cooked. When done, remove the jerky and allow it to cool at room temperature.

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The third stage is frying the jerky. After the steamed jerky has cooled, slice it thinly. Prepare a frying pan with cooking oil and heat it over medium heat. Once the oil is hot, place the sliced jerky into the pan and fry over medium heat for 5–10 minutes until cooked. When the jerky becomes golden brown, remove it and drain the excess oil. The DUJHA jerky is now ready to be served.

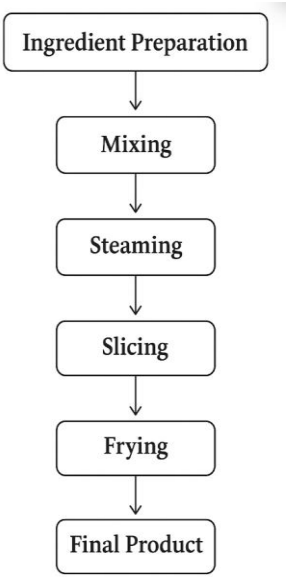

Figure 1. Process Flow of DUJHA Jerky Production.

The formulation of DUJHA jerky and the acceptability test were carried out at the Laboratory of Poltekkes Kemenkes Palembang. The method used to determine the best DUJHA jerky formula was an organoleptic test, in which human senses serve as the primary instruments for measurement (Gusnasi et al., 2021). The organoleptic test is an evaluation in which panelists express their preferences—like or dislike—toward the tested product through the senses of taste (flavor), smell (aroma), sight (color), and touch (texture). The scoring criteria were 5 (strongly like), 4 (like), 3 (somewhat like), 2 (dislike), and 1 (strongly dislike). The results obtained from the organoleptic test were then analyzed using the Friedman test.

The best formula of DUJHA jerky was analyzed for its nutrient content (energy, protein, fat, and carbohydrates) using the proximate analysis method. Vitamin C

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content was analyzed using the HPLC-PDA method, and iron content was analyzed using the ICP-OES method. All nutrient analyses were conducted at the Saraswanti Indo Genetech Laboratory in Bogor.

Statistical Analysis

The results of the organoleptic test were processed using computer software with the Friedman Analysis. The obtained data were analyzed and presented in tables with explanations. A dependent t-test was used to determine whether there was a statistically significant relationship at a 95% confidence level. This study received ethical approval from the Health Research Ethics Committee (KEPK) at Poltekkes Kemenkes Palembang with Number: 0579/KEPK/Adm2/IV/2025.

RESULTS AND DISCUSSION

Characteristics of Research Respondents

The characteristics of the respondents consisted of maternal age, gestational age, and occupation. The results of the respondents' characteristics are presented in Table 2 below.

Table 2. Characteristics of Research Respondents

Variable		n	%
Mother's Age (years)	19 – 29	26	81.3
	30 – 49	6	18.8
Gestational Age	Second Trimester	13	40.6
	Third Trimester	19	59.4
Occupation	Housewife	25	78.1
	Farmer	5	15.6
	Entrepreneur	2	6.3

The research results showed that among 32 anemic pregnant women, the majority were in the age group of 19–29 years, totaling 26 respondents (81.3%). Meanwhile, in the 30–49 years age group, there were 6 respondents (18.8%). The distribution of respondents' characteristics based on gestational trimester showed that most respondents were in the third trimester, totaling 19 respondents (59.4%), while 13 respondents (40.6%) were in the second trimester. Furthermore, the distribution of respondents' characteristics based on occupation indicated that the majority of

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pregnant women were housewives, totaling 25 respondents (78.1%). This was followed by farmers, totaling 5 respondents (15.6%), and the remaining worked as entrepreneurs, specifically traders, totaling 2 respondents (6.3%).

The Best Formula of DUJHA Jerky (Sweet Potato Leaves with Chicken Liver)

The organoleptic test, also known as a sensory test, is a method that uses human senses as the primary tool to measure product acceptability, indicating whether the product is liked or disliked. The parameters evaluated were aroma, color, taste, and texture of DUJHA jerky. The acceptability test was analyzed using the Friedman test with 30 panelists who met the selection criteria. Figure 2 shows the results of the organoleptic test on the DUJHA jerky product.

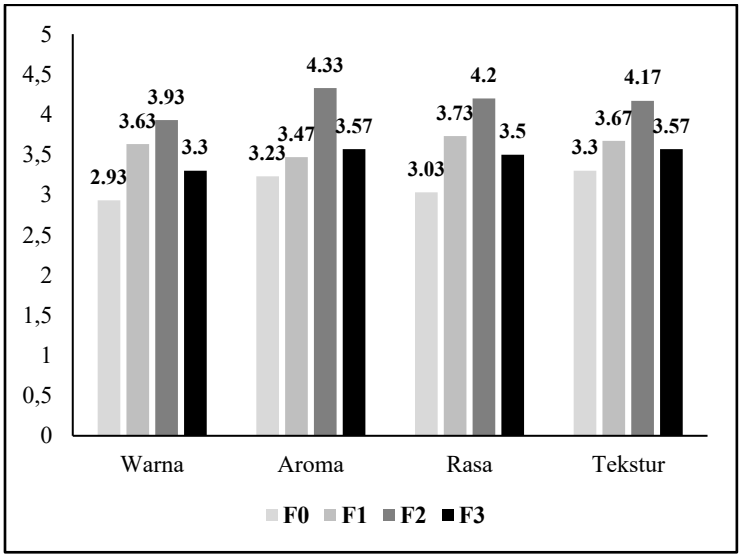

Figure 2. Results of the Organoleptic Test of DUJHA Jerky.

The results of the organoleptic test showed that the DUJHA jerky formula most preferred by the panelists was Formula 2, with average scores of color 3.9 (somewhat liked), aroma 4.3 (liked), taste 4.3 (liked), and texture 4.1 (liked). Based on the ingredients used in each formula—F0, F1, F2, and F3—it was shown that the composition of sweet potato leaves and chicken liver affects the final product.

The jerky's color became darker as the proportion of sweet potato leaves increased, resulting in a deeper green color. This is because sweet potato leaves contain

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the natural green pigment chlorophyll, which, when used in excess, affects color sensitivity and gives a darker hue to the food (Andarwulan & Faradila, 2012). A higher proportion of chicken liver increased the fishy aroma. Aroma is a key determinant of food quality, as the aroma generated by the tested formula strongly influences the product's acceptability among panelists; the more pleasant the aroma, the greater the sensory acceptance, which depends on the ingredients used or added to the formula (Nurjanah & Hidayat, 2020).

Using more chicken liver also leaves an aftertaste, while using a higher amount of sweet potato leaves can make the jerky taste bitter. Taste is one of the quality parameters perceived by the taste buds and serves as an indicator that influences consumer acceptance. If the aroma, color, and texture are good but the taste is disliked, consumers will reject the product (Winarno, 2008).

Texture is affected by the amount of sweet potato leaves used; the more leaves, the firmer the texture. Overall, the evaluation indicated that a formula with equal proportions of sweet potato leaves and chicken liver produced the best color, aroma, taste, and texture compared to the other formulas.

Analysis of Nutrient Content in DUJHA Jerky (Sweet Potato Leaves with Chicken Liver)

The nutrient content of DUJHA jerky per 100 g is as follows: energy 512.9 kcal, protein 20.6 g, fat 34.69 g, carbohydrate 32.2 g, iron (Fe) 14.1 mg, and vitamin C 0.8 mg. Consuming 100 g of DUJHA jerky as two snack servings per day can meet the nutritional needs of pregnant women based on the Recommended Dietary Allowance (RDA), providing energy 20.5%–21.3%, protein 29.4%, fat 51.5%–55.6%, carbohydrates 8%–8.4%, iron 52%, and vitamin C 1%. This indicates that consumption of DUJHA jerky should be accompanied by other sources of vitamin C to optimize iron absorption.

According to a study by Agusmayanti et al. (2020), statistical analysis showed a significant relationship between vitamin C supplementation and increased hemoglobin levels in anemic pregnant women in Ringin Sari Village, Banjar Margo, Tulang Bawang Regency, with a p-value of 0.003 (<0.05). Vitamin C functions in collagen synthesis,

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iron absorption and metabolism, calcium absorption, infection prevention, and enhancing resistance to infections. Vitamin C also aids in iron absorption in the body, which can help increase hemoglobin levels in pregnant women.

The results of the nutrient content analysis of DUJHA jerky are presented in Table 3.

Table 3. Nutrient Content of DUJHA Jerky (Sweet Potato Leaves with Chicken Liver) (per 100 g)

No.	Parameter	Average
1	Total Energi (Kcal/100 g)	523.3
2	Energy from Fat (Kcal/100 g)	312.2
3	Protein Content (%)	20.59
4	Total Fat Content (%)	34.69
5	Carbohydrates (By Difference) (%)	32.19
6	Ash Content (%)	5.75
7	Moisture Content (%)	6.77
8	Vitamin C (Ascorbic Acid) (mg/100 g)	0.80
9	Iron (Fe) (mg/100 g)	14.06

Bivariate Analysis

The statistical test used to determine the difference in hemoglobin levels of pregnant women before and after being given DUJHA jerky was the dependent t-test. Table 4 presents the differences in the mean hemoglobin levels before and after the intervention.

Table 4. Hemoglobin Levels Before and After the Intervention

Variable	n	Mean	Std. Deviation	Std. Error Mean	Sig (2-tailed)
Before	32	10.122	0.5499	0.0972	0.000
After	32	10.719	0.7575	0.1339	

The results of the statistical test (dependent t-test) showed a p-value of 0.000, indicating that there was an effect of DUJHA jerky consumption on the hemoglobin levels of pregnant women in the working area of Sukarami Public Health Center, Lahat Regency. In this study, by consuming 100 g of DUJHA jerky daily, each pregnant woman was able to meet 52% of her daily iron requirement. According to the researchers' assumptions, the variation in hemoglobin level improvement among pregnant women may be influenced by several other factors involved in hemoglobin formation, such as adequate intake of supporting nutrients (protein and vitamin C), the severity of anemia before the intervention, and the respondents' compliance in consuming

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DUJHA jerky throughout the study. These factors contributed to the differences in hemoglobin increases observed among the study participants.

Table 5. Intake of Macronutrients, Iron, and Vitamin C Before and After the Intervention

Nutrient Intake		Before			After		
	n	Min	Max	Mean	Min	Max	Mean
Energy (kcal)	32	1510,0	2146,3	1799.9	1943,4	2595,1	2276,4
Protein (g)	32	40,9	92,5	64,7	62,7	121,9	85,7
Fat (g)	32	31,4	99,2	61,3	66,2	121,8	89,3
Carbohydrates (g)	32	151,5	330,6	251	222,2	352,2	286,8
Iron (mg)	32	4,6	15,7	8,8	19,7	28,9	22,9
Vitamin C (mg)	32	10,0	118,8	60,8	67,8	120,6	104,6

Table 5 presents the results of direct interviews conducted with respondents using a 24-hour food recall before and after the intervention in the treatment group. The intake of energy, protein, fat, carbohydrates, iron, and vitamin C among the 32 respondents before the intervention showed lower average values compared to after the intervention. Before the intervention, the average intake was: energy 1,799.9 kcal, protein 64.7 g, fat 61.3 g, carbohydrates 251 g, iron 8.8 mg, and vitamin C 60.8 mg. After the intervention, the averages increased to energy 2,276.4 kcal, protein 85.7 g, fat 89.3 g, carbohydrates 286.8 g, iron 22.9 mg, and vitamin C 104.6 mg. The increase in nutrient intake among respondents occurred because all respondents received counseling on balanced nutrition before the intervention, as well as information on the nutrient content of DUJHA jerky that was provided.

The study results indicate an effect of DUJHA jerky consumption on the hemoglobin levels of pregnant women before and after the intervention, with a significance value of p = 0.000. This shows that DUJHA jerky is effective in increasing hemoglobin levels in pregnant women with anemia. Findings from Minarni et al. (2024) also demonstrated that consumption of sweet potato leaves for 14 days increased hemoglobin levels in pregnant women, with average levels rising from 8.2 g/dL before the intervention to 9.6 g/dL after, an increase of 1.4 g/dL. This is consistent with the study by Maryen et al. (2021), where the Paired Sample t-test showed a p-value of 0.000 (<0.05), indicating the effect of boiled red sweet potato leaf water on increasing hemoglobin levels in second-trimester pregnant women in the working area of Biak Kota Public Health Center. The average

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hemoglobin level increased from 7.78 g/dL before the intervention to 9.74 g/dL after the consumption of purple sweet potato leaf decoction, a rise of 1.96 g/dL. Every 100 g of red sweet potato leaves contains 48 kcal energy, 3 g protein, 0.3 g fat, 10.8 g carbohydrates, 6.4 mg iron, and 27 mg vitamin C (TKPI, 2020).

The study by Kurnia et al. (2023) showed an effect of steamed chicken liver cake on hemoglobin levels in anemic pregnant women ($p = 0.000$). The average increase in hemoglobin was 2.42 g/dL in the intervention group compared to 1.30 g/dL in the comparison group. This aligns with Purwandari et al. (2022), where the paired t-test showed $p = 0.001$ (<0.05), indicating a significant effect of chicken liver consumption on hemoglobin levels in second- and third-trimester pregnant women in the working area of Towuntu Timur Public Health Center. Every 100 g of chicken liver contains 261 kcal energy, 27.4 g protein, 16.1 g fat, 1.6 g carbohydrates, 15.8 mg iron, and 4,957 mg vitamin A (TKPI, 2020).

Iron from animal sources (heme iron) has a relatively higher absorption rate, around 37%, compared with iron from plant sources (non-heme iron), such as green leafy vegetables, which have an absorption rate of only about 5% (Santi et al., 2024). Based on the research, the increase in hemoglobin levels in most pregnant women can be influenced by several interconnected nutritional and non-nutritional factors. One of these is inadequate nutrient intake, as many pregnant women consume more plant-based protein and iron sources, even though non-heme iron has lower bioavailability compared to heme iron. Likewise, plant-based proteins are less effective than animal proteins in supporting iron absorption.

Socioeconomic factors also play an important role. Based on respondent data, most pregnant women did not work or were housewives who depended economically on their husbands. Limited family income can affect daily dietary patterns, particularly in obtaining nutrient-dense foods such as meat, fish, green vegetables, and fruits rich in vitamin C. In addition, limited nutritional knowledge—particularly about choosing nutritious foods and proper food preparation—may result in suboptimal iron absorption.

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CONCLUSION

Formula 2, with a 1:1 ratio of sweet potato leaves to chicken liver, is the best formulation for DUJHA jerky. The average hemoglobin level of pregnant women before and after the intervention increased from 10.122 g/dL to 10.719 g/dL, with an average difference of 0.597 g/dL. Thus, it can be concluded that DUJHA jerky is effective in increasing the hemoglobin levels of pregnant women in the working area of Sukarami Public Health Center. DUJHA jerky (sweet potato leaves and chicken liver) can serve as an alternative supplementary snack (PMT) for pregnant women with anemia.

BIBLIOGRAPHY

Agusmayanti R, Farich A, Anggraini. 2020. Pengaruh Pemberian Vitamin C Terhadap kadar Hemoglobin Pada Ibu Hamil Anemia Di Desa Ringin Sari Banjar Margo Kabupaten Tuba Tulang Bawang Tahun 2019. *Jurnal Kebidanan Malahayati*, *6*(3), 342–348. https://doi.org/10.33024/jkm.v6i3.1731

Andarwulan N, Faradila N. 2012. Stabilitas Klorofil dan Hubungan Dengan Perubahan Warna pada Produk Pangan Mengandung Daun Hijau. Jurnal Teknologi dan Industri Pangan.

Asmin E, Salulinggi A, Titaley CR, Bension J. 2021. Hubungan Pengetahuan Dan Kepatuhan Ibu Hamil Konsumsi Tablet Tambah Darah Dengan Kejadian Anemia Di Kecamatan Leitimur Selatan Dan Teluk Ambon. *Jurnal Epidemiologi Kesehatan Komunitas*, *6*(1), 229–236. https://doi.org/10.14710/jekk.v6i1.10180

Dana TP. 2020. Sampling Methods in Research Design.

Gusnasi D, Taufiq R, Baharta E. 2021. Uji Organoleptik dan Daya Terima pada Produk Mousse Berbasis Tapai Singkong Sebagai Komoditi UMKM Di Kabupaten Bandung. *Jurnal Inovasi Penelitian*, *1*(12), 2883–2888.

Harti GFS, Hanifa F, Handayani. 2024. Perbandingan Pemberian Sayur Bayam dan Daun Ubi Jalar Terhadap Perubahan Hemoglobin Ibu Hamil Dengan Anemia Di TPMB Ny. G Kabupaten Garut Tahun 2024. *Innovation Research and Knowledge*, *4*(6), 2020–2025.

Kurnia M, Eliza, Hartati Y, Sihite NW. 2023. Pengaruh Pemberian Bolu Kukus Hati Ayam Terhadap Kadar Hamoglobin Pada Ibu Hamil Anemia. *JGMI:TheJournalofIndonesianCommunityNutrition*, *Vol.12No.2*, 165–176.

Maryen K, Supardi N, Nahira, Rosfdianah, Arsyad NA. 2021. Rebusan Daun Ubi Jalar Ungu (*Ipomoea Batatas* L) Terhadap Peningkatan Kadar Hemoglobin Pada Ibu Hamil Trimester III. *Universitas Megarezky*, *3*(1), 73–79.

Migiarti I, Velianda F, Ginting ASB. 2024.

DOI 10.20884/1.jgipas.2025.9.2.17696

Pengaruh Pemberian Rebusan Air Daun Ubi Jalar Terhadap Penyembuhan Anemia Ringan Pada Ibu Hamil. *Univesitas Indonesia Maju*, *3*(3), 436–442.

Minarni, Wulandari R, Munawaroh M. 2024. Pengaruh Pemberian Daun Ubi Jalar Dan Rumput Laut Terhadap Peningkatan Kadar Hemoglobin Pada Ibu Hamil Dengan Anemia Sedang. *Journal of Social Science Research*, *4*, 1593–1602.

Nurjanah E, Hidayat R. 2020. Peran Aroma Terhadap Tingkat Penerimaan Panelis Pada Produk Pangan Berbasis Protein Hewani. *Jurnal Gizi dan Pangan Indonesia*, 15(2), 98-106.

Podojoyo P, Yulianto B, Ningsih AS, Friantini T, Hartati Y. 2021. Formulation and Receiving Power Cookies Hayakarah as an Effort to Prevent Anemia. *Proceedings of the First International Conference on Health, Social Sciences and Technology (ICoHSST 2020)*, *521*(ICoHSST 2020), 207–211. https://doi.org/10.2991/assehr.k.210415.044

Purwandari A, Korompis MD, Tombokan S, Lontaan A, Lumbu A. 2022. Konsumsi Hati Ayam Efektif meningkatkan Kadar Haemoglobin Ibu Hamil Trimestes II dan III. *E-Prosiding SEMNAS*, *1*, 128–138.

Purwandari A, Korompis MD, Tombokan S, Lontaan A, Lumbu A. 2022. Konsumsi Hati Ayam Efektif meningkatkan Kadar Haemoglobin Ibu Hamil Trimestes II dan III. *E-Prosiding SEMNAS*, *1*, 128–138.

Santi A, br G, Sugesti R, Purwandi BR. 2024. Pengaruh Pemberian Hati Ayam dan Pemberian Tablet Fe Terhadap Peningkatan Kadar Hemoglobin Pada Remaja Putri di UPT Puskesmas Jawilan Tahun 2024. *Journal Of Social Science Research* , *4*, 12002–12015.

Santosa H, Handayani NA, Nuramelia C, Sukma NYT. 2016. Pemanfaatan Hati Ayam Sebagai Fortifikasi Zat Besi Dalam bubur Bayi Instan Berbahan Dasar Ubi Jalar Ungu (Ipomoea Batatas L.). *Inovasi Teknik Kimia*, *1*(1), 27–34.

Simbolon DO, Masfria, Sudarmi. 2012. Pemeriksaan Kadar Fe Dalan Hati Ayam Ras dan Ayam Buras Secara Spektrofotometri Serapan Atom. *Journal of Natural Product and Pharmaceutical Chemistry*, *1*(1), 8–13.

Sugiyono. 2013. Metode Penelitian Kuantitaf, Kualitatif, dan R&D. Bandung: Alfabeta, CV. *(E-book)*https://digilib.stekom.ac.id/assets/dokumen/ebook/feb_35efe6a47227d6031a75569c2f3f39d44fe2db43_1652079047.pdf

Tanziha I, Damanik MRM, Utama LJ, Rosmiati R. 2019. Faktor risiko anemia ibu hamil di indonesia. *Jurnal Gizi Dan Pangan*, *11*(2), 143–152.

TKPI. 2020. Tabel Komposisi Pangan Indonesia. In *Tabel Komposisi Pangan Indonesia*.

Winarno G, 2004. Kimia Pangan dan Gizi. PT Gramedia Pustaka: Jakarta

Yuliastuti LP, Agustkawati N, Setianingsih F. 2022. Efektivitas Konsumsi Daun Ubi Jalar Ungu Terhadap

DOI 10.20884/1.jgipas.2025.9.2.17696

Peningkatan Kadar Hemoglobin Darah Ibu Hamil Trimester Pertama. *Al-Insyirah Midwifery: Jurnal Ilmu Kebidanan (Journal of Midwifery Sciences)*, *11*(1), 62–68. https://doi.org/10.35328/kebidanan.v11i1.2133

DOI 10.20884/1.jgipas.2025.9.2.17696