Jurnal Eduhealth
Volume 16, Number 01 2025 DOI 10.54209/eduhealth.v16i01
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Effect Of Banana Heart Consumption On Milk Production In Breastfeeding Mothers In The Working Area Of Rejosari Health Center Pringsewu Sub-District

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Article Info
Keywords:
Banana Heart,
Breastfeeding,
Breast milk production

ABSTRACT
Rejosari Health Center, in 2023 the achievement of infants < 6 months getting breast milk exclusively is still below the national target of below 80% at 73.1%. One of the efforts to increase breast milk production is by consuming banana heart because it contains lactagogum substances that stimulate oxytocin and prolactin hormones to increase and facilitate breast milk production. This study aims to determine the effect of banana heart consumption on milk production in breastfeeding mothers. This type of quantitative research is a quasi-experimental design with a pretest-posttest approach with nonequivalent control group. The population of postpartum women on the fourth day was 23 people, the sample amounted to 20 people where 10 people in the intervention group and 10 people in the control group were taken by accidental sampling, when found by chance meeting the criteria immediately used as research samples. This study was conducted in the Rejosari Health Center working area by giving banana heart 2 times a day as much as 200 grams / day for 7 days to respondents. The average breast milk production of the intervention group before the intervention was 15 ml, to 86 ml after the intervention. The average pretest value of breast milk production of the control group was 11 ml, after posttet to 25 ml. The results of the Mann Whitney analysis showed that there was an effect of banana heart consumption on milk production expenditure in breastfeeding mothers with a p-value = 0.000, so it was concluded that there was an effect of banana heart consumption on milk production expenditure in breastfeeding mothers in the working area of the Rejosari Health Center, Pringsewu District in 2024 with a p-value = 0.000. It is expected that breastfeeding mothers utilize banana heart as a natural alternative that can support increased milk production, while still considering balanced nutritional intake and medical consultation.

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INTRODUCTION

Breastfeeding is one of the best things for survival to improve the health, social and economic development of individuals and nations. Despite high global breastfeeding initiation rates,

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only 40% of all infants under 6 months are exclusively breastfed and 45% are breastfed until 24 months of age. Breastfeeding rates vary widely across regions and countries (Ministry of Health, 2020) .

Exclusive breastfeeding worldwide is still low. Based on UNICEF data (2018), there was an increase in exclusive breastfeeding in the world from 36% in 2000 to 41% in 2018, but this figure is still below the SDGs target of 50%. In general, breastfeeding rates in the world are quite low. According to the *Global Breastfeeding Scorecard* report, which evaluates breast*feeding* data from 194 countries, the percentage of infants under six months of age who are exclusively breastfed is only 40%. In addition, only 23 countries have exclusive breastfeeding rates above 60% (Zelharsandy & Sholeha . , 2024)

Data from the Indonesian Ministry of Health (2022) in Indonesia, only 50% of infants are exclusively breastfed and only 5% of children are still breastfed after exclusive breastfeeding, meaning Indonesian children are not receiving the nutrition they need during early life. More than 40% of infants are introduced to complementary foods too early and the foods provided often do not meet infants' nutritional needs (WHO, 2020). WHO has endorsed global targets to improve nutrition for mothers, infants and young children, with a target of 50% exclusive breastfeeding globally by 2025. Then the *Global Breastfeeding Collective* under the leadership of WHO and UNICEF set a target of at least 70% exclusive *breastfeeding* by 2030. Indonesia provides nutrition improvement targets for health development efforts to prevent stunting in 2020-2024, one of which is the promotion of exclusive breastfeeding to reach the target of 60% (Friscila & Mariana, 2023) .

Indonesia's exclusive breastfeeding achievement in 2018 was 68.7%, in 2019 it decreased to 65.8%, in 2020 it increased to 69.62%. In 2021, the decline in exclusive breastfeeding achievement again occurred at 52.5%, which is a 12% decrease from the 2019 figure, then in 2022 the exclusive breastfeeding achievement in Indonesia was 66% (Parellangi & Syukur, 2023) .

Data from the Lampung Provincial Health Profile in 2022 that the coverage of infants < 6 months of exclusive breastfeeding in Lampung Province in 2020 was 70.1%, then in 2021 it was 73.6%, while in 2022 it was 75.37%, this coverage has increased from year to year to reach the expected target of 70% which is the national target in 2022, while the achievement per city district area in 2022 for Pringsewu district of 75.5% is a district whose achievements have reached the national target (Lampung Province Health Profile Report, 2022) .

Data from the Pringsewu Health Office in 2023 that the coverage of infants < 6 months getting breast milk (ASI) exclusively per achievement of the puskesmas working area which is still below the national target is Puskesmas Rejosari, in 2023 the achievement of infants < 6 months getting breast milk (ASI) exclusively is still below the national target of below 80% at 73, 1% (Pringsewu Health Profile Report, 2023) .

The government's efforts to support the movement of breastfeeding to infants with several policies, namely Law Number 3 of 2009 concerning health which is stated in article 128 paragraphs 2 and 3 that during breastfeeding, the family, local government, and community must support by providing special time and facilities. Then, Government

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Regulation of the Republic of Indonesia Number 33 of 2012 concerning exclusive breastfeeding article 6, reads that every mother who gives birth must provide exclusive breastfeeding to the baby she gives birth to. Law No. 36/2009 article 128 paragraph 2 and 3 states that during breastfeeding, the family, local government, and community must fully support the mother (Harti et. all., 2023) .

Factors that cause low exclusive breastfeeding are low maternal nutritional intake and psychological feelings that the amount of breast milk produced is not enough to meet the baby's demand and the promotion of bottle milk as a substitute for breast milk (Harti et. all., 2023) . The impact of babies not being breastfed will lead to an increased susceptibility to disease in children. Exclusive breastfeeding can prevent one-third of respiratory infections and a 58% reduction in the incidence of severe bowel disease in premature infants, while breastfeeding mothers reduce the risk of breast cancer by 5-10% (Harti et. all., 2023) .

Lack of support for mothers, early breastfeeding difficulties can cause the production of breast milk (ASI) to be hampered and the amount of breast milk that comes out is not enough, this shows that a mother's decision to breastfeed requires support from all parties closest to her which is useful for the growth and development of the baby to be optimal physically, mentally and intelligence. Support given to breastfeeding mothers creates a sense of belief and confidence that she is able to produce sufficient and smooth breast milk for her baby (Andayani, 2020) in (Harti et. all., 2023) .

Efforts to increase breast milk production include the consumption of foods such as katuk, chayote, long beans, moringa leaves and banana heart. Banana heart has the potential to stimulate oxytocin and prolactin hormones that are effective in increasing and facilitating breast milk production, banana heart is easily available so it is suitable to help increase breast milk (Harti et. all., 2023) . Banana heart can be used as various types of food and processed vegetables. From the African Journal of Biotechnology that has been researched, it was found that 100 grams of banana heart contains many nutrients such as 51 kilo calories, 1.6 g fat, 9.9 carbohydrates, 5.7 fiber, 56 mg calcium, 73.3 mg phosphorus, 56.4 mg iron, 13 mg copper, 553.3 mg potassium, 48.7 mg magnesium and 1.07 mg vitamin (Susanti, 2023) . Banana heart also contains *lactagogum* substances such as *alkaloids, polyphenols, steroids, flavonoids* and other substances in stimulating oxytocin and prolactin hormones to increase and facilitate breast milk production (Harahap et. all., 2024).

Research conducted by Yuliani et.all. (2023) used a pseudo-experiment *with a pretest*-posttest *with control group design* using two types of treatment. The group consumed 200 grams of banana heart twice a day. Research Results: Mean breast milk production before treatment ranged from 401-500 cc with a mean value of 496.66, mean breast milk production after treatment ranged from 801-900 cc with a mean value of 816.66, mean breast milk production in the control group ranged from 401-500 cc with a mean value of 453.33 in breastfeeding mothers in the Murung Pudak Health Center Working Area. Conclusion: Banana heart consumption is proven to increase breast milk production in the treatment group of nursing mothers in the working area of the Murung Pudak Health Center (Friscila & Mariana, 2023) .

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Other research results, type of quantitative research with *quasi-experimental* method with One group pretest-posttest approach. The population was 34 respondents, the sample used was breastfeeding mothers, statistical tests using dependent t-tests. Location in the Siring Betik Health Center Working Area, Wonosobo District, Tanggamus, results: obtained a p-value of 0.000 (α <0.05). There is an effect of musa paradisiaca consumption on breast milk production of nursing mothers (Rinaldi & Aprina, 2020) .

The results of the pre-survey in the Rejosari Health Center Working Area in 2023 breastfeeding coverage of infants aged less than six months getting exclusive breastfeeding was 61.1%. While infants aged six months received exclusive breastfeeding of 62.43%. In January-June 2024, the coverage of six-month-old infants exclusively breastfed was 64.52% of the national target of 80%. The results of interviews with 6 breastfeeding mothers showed that the cause of breast milk not coming out immediately was due to stress and fatigue after giving birth, the wrong way of breastfeeding, food restrictions, breast swelling. The management that has been done is to provide education to patients on how to breastfeed properly, support husband and family, eat according to the contents of my plate. Based on this background, the author is interested in conducting research with the title "The Effect of Banana Heart Consumption on Milk Production Expenditure in Breastfeeding Mothers in the Rejosari Health Center Working Area, Pringsewu District".

METHOD

This type of research is quantitative with a *quasy experimental* research design with a *pretest- posttest* approach *with nonequivalent control group design.* The population in this study was 23 breastfeeding mothers on the fourth day in the Rejosari Health Center Working Area, Pringsewu District, Pringsewu Regency in 2024. The sample size in this study was 20 respondents who were divided into 2 groups, 10 people in the intervention group were given banana heart and 10 people in the control group selected by *accidental sampling* technique. Respondents in the intervention group consumed banana heart as much as 200 grams twice a day or 2 x 100 grams for 7 consecutive days. The research instrument used a questionnaire and the data analysis used was the *Wilcoxon* test and the *Mann Whitney* test.

a. Inclusion criteria:
   1) Mothers with normal labor
   2) Fourth day postpartum mom
   3) Postpartum mothers who are willing to be respondents
   4) Mother does not have any disease: SEZ, medication, smoking, drinking.
b. Exclusion criteria :
   1) Mothers who don't like banana heart
   2) There are health problems in the baby
   3) Mothers who have babies with disabilities, such as *labiapalatoscisis*.
   4) Low birth weight
   5) Mothers who take breast milk *booster* supplements.

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RESULTS

Univariate Analysis

Table 1. Frequency Distribution of Characteristics of Breastfeeding Mothers in the Rejosari Health Center Working Area, Pringsewu District

Characteristics	N	%
Age		
<20 Th	1	5%
20-35 Years	17	85%
>35 Years	2	10%
Education		
SD	4	20%
SMP	8	40%
HIGH SCHOOL	8	40%
Parity		
Primigravida	10	50%
Multigravida	10	50%
Total	20	100%

Based on table 1. It can be seen that the age characteristics of respondents are mostly in the age range of 20-35 years, namely 17 people (85%). While for the average education level, most of the respondents with a junior high school education level, namely as many as 8 people (40%), and a high school education level of 8 people (40%). As for the characteristics of multigravida parity, there were 10 people (50%) and primigravida as many as 10 people (50%) out of 20 respondents.

Table 2: Frequency of Urination in Intervention Group and Control Group

Variables	N	Min-Max	Mean	SD
Intervention Group				
Before (*Pretest*)	10	3 - 4	3,50	0,527
After (*Posttest*)	10	6 - 10	7,60	1,713
Control Group				
Before (Pretest)	10	3 -3	3,00	0,00
After (Posttest)	10	4 - 6	5,40	0,699

Based on table 2. it can be seen that the frequency of infant urination obtained in the intervention group before giving banana heart, the average frequency of urination was 3 times and after the intervention the average increased to 7 times. Whereas in the control group on day -1 assessment the average frequency of urination was 3 times, and on day 8 posttest assessment the average frequency of urination was 5 times.

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Table 3. Average Distribution of Breast Milk Production among Breastfeeding Mothers in the Intervention Group

Variables	N	Min-Max	Mean	SD
Before (*Pretest*)	10	10 - 30	15,00	6,667
After (*Posttest*)	10	30 - 180	86,00	62,039

Based on table 3. it can be seen that the average distribution of breast milk production of breastfeeding mothers in the intervention group before the intervention was 15.00 ml, while after the intervention it was 86.00 ml. The increase in breast milk production experienced by the intervention group was 71 ml.

Table 4. Frequency Distribution of Average Milk Production in Breastfeeding Mothers in Control Group

Variables	N	Min-Max	Mean	SD
Before (*Pretest)*	10	10 - 15	11,00	2,108
After (*Posttest*)	10	15 - 35	25,00	6,236

Based on table 4. it can be seen that the distribution of the average value before the intervention of breast milk production of nursing mothers in the control group was 11.00 ml, while after the intervention it increased to 25.00 ml. The increase in breast milk production experienced by the control group was 14 ml.

Bivariate Analysis

Table 5. Differences in Breast Milk Production Before and After the Intervention

Variables	N	Negative Ranks	Positive Rank	Ties	*p-value*
Pretest - Posttest	10	0	10	0	0,005

The results of the analysis of table 5 using the *Wilcoxon test* showed that the *p-value* = 0.005, indicating that there was a difference in breast milk production before and after the intervention of giving banana heart.

Table 6. Differences in Breast Milk Production Before and After in the Control Group

Variables	N	Negative Ranks	Positive Rank	Ties	*p-value*
Pretest - Posttest	10	0	10	0	0,005

The results of the analysis from table 6 using the *Wilcoxon test* showed that the *p-value* = 0.005, indicating that there was a difference in breast milk production before and after in the control group.

Table 7. Effect of Giving Banana Heart on Milk Production Expenditure in Breastfeeding Mothers in the Rejosari Health Center Working Area

Amount of breast milk	N	Mean	Sum of Ranks	*p-value*
Intervention Group	10	86,00	150,5	0,000
Control Group	10	25,00	59,5	

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The results of the analysis of table 7 based on the *Mann Whitney* test obtained statistical test results *p-value* = 0.000 (*p-value <0.*05) which means that there is a significant difference in breast milk production after the intervention between the two groups as much as 61 ml so it can be concluded that there is an effect of banana heart consumption on milk production expenditure in breastfeeding mothers in the working area of the Rejosari Health Center, Pringsewu District.

Discussion

Respondent Characteristics

Age

The results of data on the age characteristics of respondents are mostly in the age range of 20-35 years, namely 17 people (85%), age <20 years as many as 1 person (5%), and >35 years as many as 2 people (10%). A healthy reproductive age is between 20 to 35 years. This age range is considered the optimal period for pregnancy, childbirth, and breastfeeding. During this healthy reproductive age range, breast milk production tends to be sufficient because the reproductive organs are still working optimally. This is because during this period, the reproductive organs and the mother's psychology are ready to receive the baby. Therefore, this age is the right age to provide exclusive breastfeeding.

Six-month breastfeeding success rates were higher among younger mothers than older mothers. In addition, increasing maternal age is associated with increased experience in breastfeeding, development of a mature mindset, and greater work experience. However, for mothers aged 35 years, there is a high risk associated with the decline in the function of reproductive and other organs. This can increase the risk of complications during pregnancy, labor, and breastfeeding (Yahuda *et all .* ., 2025)

This is in line with research Kurniawati (2021) which states that the majority of respondents' age characteristics are at the age of <20 years as many as 12 (40%) people, while between 20 - 35 years of age there are 16 (53.3%) respondents and the least at the age of >35 years there are 2 (6.7%) respondents (Kurniawati, 2021) .

According to the researcher's assumption, 20-35 years old is the optimal age range for pregnancy, childbirth, and exclusive breastfeeding according to the results of the data analysis of respondents' age characteristics. From the table presented, it can be seen that most respondents (85%) were in the age range of 20-35 years, which supports the researcher's assumption that this age is a healthy reproductive age and ideal for successful breastfeeding. This assumption is also reflected in the analysis, which shows that mothers in the 20-35 age group tend to have a better ability to provide exclusive breastfeeding, due to more optimal physical and psychological readiness factors compared to younger or older mothers.

The results of the data analysis, which showed that 85% of the respondents were in the age range of 20-35 years, reinforced the notion that mothers at this age are more likely to have sufficient milk production and more mature experience in caring for infants. On the other hand, the data analysis also showed that mothers under 20 years old accounted for only 5% and those over 35 years old accounted for 10%. These age groups are likely to face more

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challenges, both physical and psychological, in the practice of exclusive breastfeeding, in accordance with the researcher's assumption of an increased risk of complications at older ages.

Overall, the results of the data analysis support the researcher's assumption that 20-35 years of age is the optimal age for successful exclusive breastfeeding practices, both in terms of physical and psychological readiness, as well as more adequate milk production.

Education

The results of data analysis of the average education level of most respondents with a junior high school education level, namely 8 people (40%), and a high school education level of 8 people (40%). A person's level of education can affect the mindset so that it can capture new information. Education level can influence social attitudes and behavior. Respondents who have higher education have good and broad knowledge compared to low levels of education (Hutabarat, 2020) .

The low education level of the community is often the main reason why mothers do not have access to good information. However, with the advancement of communication and information systems today, low education levels are no longer a major factor hindering the use of exclusive breastfeeding. Mothers with low education are now given the opportunity to get additional information on breastfeeding, so they can better understand the importance of exclusive breastfeeding.

A person's education is not only determined by their level of formality, because through social media and mass media, messages about the importance of exclusive breastfeeding can be easily received and understood by mothers, both from health workers and the community. Education is seen as a process of forming the ability of individuals, groups, or communities to achieve the desired goals (Yahuda et all . ., 2025)

This is in line with research Kurniawati (2021) which states that the most educational characteristics are junior high school / equivalent as many as 10 (33.3%) respondents, then high school / equivalent as many as 9 (30%) respondents, then elementary school there are 8 (26.7%) respondents and the least university there are 3 (10%) respondents (Kurniawati, 2021) .

According to the researcher's assumption based on the results of the analysis showing that most of the respondents had an education level of junior high school (40%) and senior high school (40%), it can be concluded that a lower level of education might affect the understanding and knowledge of mothers regarding breast milk production. Mothers with lower education levels often have limited knowledge about factors that can affect breastmilk production, such as diet, adequate rest, and proper breastfeeding techniques. Low education levels may also hinder a mother's ability to seek further information or access resources that can help improve breastmilk production.

However, with the development of technology and communication systems, barriers caused by low education levels can be overcome. Nowadays, mothers with low education can access information related to breastmilk production through various channels, such as social media, television, or online health services. With easily accessible information, mothers can

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https://ejournal.seaninstitute.or.id/index.php/healt

better understand how to increase their breastmilk production, even if they do not have a higher education background.

Parity

The results of data analysis of the characteristics of multigravida parity were 10 people (50%) and primigravida were 10 people (50%) out of 20 respondents. Parity is the number of births a woman has that affects breast milk production. Mothers who have given birth more than once have experience in breastfeeding where lactation management will run well while primiparous mothers have no experience and lack of knowledge in breastfeeding. In addition, psychological readiness in primiparous and multiparous mothers is easier to feel anxious so that in this condition it interferes with the release of hormones that play a role in breast milk production (Hutabarat, 2020) .

Primiparous mothers have more breastfeeding problems than multiparous mothers. Mothers who have breastfed will be better than mothers who are breastfeeding for the first time. Primiparous mothers should get more attention to be able to breastfeed well and exclusively (Yahuda et al . ., 2025)This is in line with the research of Ariani (2021) which states that out of 41 respondents (100%), 12 respondents (29.3%) had primiparous parity, and as many as 29 respondents (70.7%) had multiparous parity (Ariani, 2021) .

The results of the data analysis showed that 50% of the respondents were primigravida and 50% were multigravida, the researcher assumed that the breastfeeding experience of multigravida mothers would have a positive effect on their milk production. Mothers who have given birth and breastfed before tend to have a better understanding of effective breastfeeding techniques and lactation management, which allows them to produce breast milk more smoothly. In contrast, primiparous mothers who have no breastfeeding experience are more prone to face challenges in the breastfeeding process, such as difficulty in finding a comfortable breastfeeding position, problems with latch-on, and other issues that can affect milk production.

We assume that primiparous mothers need more attention, both in terms of education about the right ways to breastfeed and emotional support. Anxiety and uncertainty experienced by primiparous mothers often affect the release of hormones that play a role in milk production, such as oxytocin and prolactin. This anxiety can interfere with the smooth process of breastfeeding, which in turn has an impact on milk production.

Frequency of Urination

The results of the analysis based on the frequency of infant urination obtained in the intervention group before giving banana heart, the average frequency of urination was 3 times and after the intervention the average increased to 7 times. Whereas in the control group on day -1 assessment, the average frequency of urination was 3 times, and on day 8 posttest assessment, the average frequency of urination was 5 times. Increased frequency of urination in infants is an indicator that the baby is receiving adequate amounts of breast milk, because babies who are adequately breastfed will usually urinate at least 6-8 times a day.

Banana heart is known to contain fiber, bioactive compounds, and other nutrients that can improve digestion and kidney function. In theory, intake of fiber and bioactive compounds

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https://ejournal.seaninstitute.or.id/index.php/healt

from food can stimulate kidney function, increase urine production, and improve digestive health, which in turn increases the frequency of urination (Sella Oktarika, 2022) .

According to the researcher's assumption, the increased frequency of urination in infants in the intervention group after banana heart feeding can be explained by the nutritional content of banana heart, which is rich in fiber, vitamins, and minerals. These nutrients can increase breast milk production in mothers, so that infants receive more optimal fluid intake. The increased volume of fluid intake by the infant directly increases urine production and frequency of urination.

Meanwhile, in the control group, although no special intervention was given, the increase in frequency of urination was likely due to the infant's natural growth factors. With age, the baby's organ functions, including the kidneys, become more mature, so the body's ability to process fluids increases. In addition, changes in the mother's diet, environment or better quality of care may indirectly contribute to increased milk production, although it was not recorded as an intervention in the study. This phenomenon suggests that natural external and internal factors may also influence the frequency of infant urination, albeit at a lower intensity compared to the intervention group.

Average Distribution of Milk Production in Breastfeeding Mothers in the Intervention Group

The data results showed that the average distribution of breast milk production of breastfeeding mothers in the intervention group before the intervention was 15 ml, while after the intervention it was 86 ml. The increase in breast milk production experienced by the intervention group was 71 ml.

Increasing breast milk production can be done without drugs by using complementary care, one of which is through the consumption of banana heart. Banana heart contains various bioactive compounds such as polyphenols, alkaloids, flavonoids, and steroids, which can stimulate an increase in prolactin and oxytocin hormones. Prolactin plays a role in milk production, while oxytocin supports the milk ejection reflex. The use of banana heart as a lactagogue has been shown to significantly increase milk production. Several studies have shown that the administration of banana heart, either boiled or cooked in other ways, is effective in facilitating milk production in lactating mothers. Banana heart is also easily available and affordable, making it a practical choice for breastfeeding mothers who want to increase breast milk naturally (Yuliani, 2023) .

The banana heart has the potential to stimulate the hormones oxytocin and prolactin, which are effective in increasing and facilitating breast milk production. The process of breast milk production is also influenced by several factors including nutritional factors, breast care, infant suction factors, social and cultural factors, breastfeeding and psychological factors. This nutritional factor needs to be considered by a mother in the breastfeeding process because in increasing breast milk production a mother must increase her nutritional needs by increasing the portion of food that contains protein because the protein content functions to form new tissues for breast milk production (Manalu et al, 2020) .

This is in line with the research of Astari & Hardianti (2022) which states that out of 20 respondents, the average breast milk production in postpartum mothers before consumption of

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processed banana heart is 81.50 ml per minute with a standard deviation value of 16.63 and the least breast milk production is 60 ml per minute and the most breast milk production is 115 ml per minute. While the average breast milk production in postpartum mothers after consumption of processed banana heart is 99.55 ml per minute with a standard deviation value of 14.22 and the least breast milk production is 85 ml per minute and the most breast milk production is 130 ml per minute (Astari & Hardianti, 2022) .

Strengthened by research Yuliani (2023) stated that the average distribution of breast milk production before consumption of banana heart in the treatment group in the working area of the Murung Pudak Health Center, showed that breast milk production before treatment was mostly in the range of 401-500 cc, namely 6 respondents (40%) with an average value or Mean of 496.6667. While the mean distribution of breast milk production after consumption of banana heart in the treatment group showed the most in the range of 801-900 cc obtained by 6 respondents (40%) with a mean or Mean value of 816.6667 (Yuliani, 2023) .

In this study, researchers assumed that banana heart consumption could significantly increase breast milk production in lactating mothers through stimulation of the hormones prolactin and oxytocin. This assumption is based on the fact that banana heart contains bioactive compounds such as polyphenols, alkaloids, flavonoids, and steroids that are known to stimulate these two hormones, which play an important role in milk production and secretion. In addition, researchers assume that psychological, social, and cultural factors also influence successful breastfeeding. Thus, the use of banana heart as a lactagogue should not only focus on the physical aspects but also take into account the psychological and social support for breastfeeding mothers in improving lactation success.

Average Distribution of Breast Milk Production in Breastfeeding Mothers in Control Group

The results of the data showed that the distribution of the average pretest value of breast milk production of breastfeeding mothers in the control group was 11 ml, while after the posttet increased to 25 ml. The success of breastfeeding mothers is largely determined by diet, both during pregnancy and after childbirth. In order for a mother's breast milk to be guaranteed in both quality and quantity, highly nutritious and balanced food needs to be consumed every day. This means that the mother should increase the consumption of carbohydrates, fats, vitamins, minerals and water in the amount that suits the body's needs during breastfeeding. If these needs are not met, in addition to the quality of breast milk and maternal health being compromised, it will also affect the length of time the mother can produce breast milk (Suharman et all . ., 2021)

Milk production occurs as a consequence of the hormone prolactin, released by the anterior pituitary gland, which stimulates milk production in the breast. Sucking will cause milk to escape from the lactiferous sinuses while the baby is awake. The act of sucking will activate nerve endings in the breast area that will send signals to the anterior pituitary gland, which will encourage the production of the hormone prolactin. Prolactin will then be released into the bloodstream, stimulating milk production in the breast. The milk production reflex, also known as the prolactin reflex, is a physiological response to lactation (Yuliani, 2023) .

Jurnal Eduhealth
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Factors affecting breast milk production in breastfeeding mothers involve various aspects, including maternal nutritional status, hormones and social support. Mothers who eat a nutritionally balanced diet, such as one containing vitamins, minerals and omega-3 fatty acids, tend to have better milk production. Nutritional deficiencies can compromise the quality and quantity of breastmilk produced, although mothers can still produce adequate quality breastmilk if their nutritional intake is sufficient. In addition, the hormones prolactin and oxytocin play an important role in milk production and expression. Social support, both from partners and family, also influences mothers' perceptions of their breastmilk adequacy, with mothers who feel supported tending to be more confident in breastfeeding. Several studies have shown that these factors are interrelated and need to be considered in an effort to increase breastmilk production (KOÇ et all . ., 2024)

In line with research Zelharsandy & Soleha (2024) which states that the average distribution of breast milk production of the control group who did not consume banana heart kapok in nursing mothers was 3.73 with a standard deviation of 0.704 (Zelharsandy & Soleha, 2024) .

This is reinforced by research Harti, et al (2023) which states that in the control group during the first measurement, the average breast milk production score was 58.46 with a standard deviation of 10.466. After seven days, the second measurement was carried out and the average breast milk production score was 72.31 with a standard deviation of 7.646 (Harti et all .., 2023)

According to the researcher's assumption, the factors that influence breast milk production in breastfeeding mothers are complex and interrelated. We assume that increased milk production is not only influenced by hormonal factors, but also by a nutritious diet, such as adequate consumption of carbohydrates, fats, vitamins, minerals and water. In addition, external factors such as social support from partners or family are also believed to play an important role in increasing the mother's confidence, which in turn can have an impact on the smooth production of breast milk. Based on previous findings, we also assumed that mothers' psychological state, including perceptions of breastmilk adequacy, could influence breastfeeding success. Therefore, we suggest that these aspects be considered in an effort to increase breastmilk production in breastfeeding mothers.

Effect of Banana Heart Feeding on Milk Production Expenditure in Breastfeeding Mothers

The data results based on the Wilcoxon test in the intervention group showed that the p-value = 0.005, indicating that there was a difference in breast milk production before and after the intervention of giving banana heart. Meanwhile, the control group also showed the same result, p-value = 0.005, indicating that there was a difference in breast milk production before and after the provision of education.

Based on the Mann Whitney test, the statistical test result of p-value = 0.000 (p-value <0.05) means that there is a significant difference in breast milk production after the intervention between the two groups as much as 61 ml. so it can be concluded that there is an effect of banana heart consumption on milk production expenditure in breastfeeding mothers in the working area of the Rejosari Health Center, Pringsewu District, 2024.

Jurnal Eduhealth
Volume 16, Number 01 2025 DOI 10.54209/eduhealth.v16i01
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Banana heart is a food ingredient that is used to increase breast milk production. The advantage of banana heart is that it is affordable and easily available around Pringsewu Regency, and can even be grown in your own yard. In addition, banana heart contains lactogogum, a nutrient that can facilitate breast milk production (Yuliani, 2023) .

The heart of pisang kepok contains lactogogum, a substance that can stimulate increased breast milk production, especially in mothers who experience problems in milk production. This content affects the prolactin hormone, which stimulates cells in the alveoli to produce breast milk. The breast milk that comes out then stimulates the oxytocin hormone to secrete breast milk (Zainuddin & Munadhir, 2020) .

In addition to the lactogogum content that can stimulate oxytocin and prolactin hormones, banana heart also has pharmacological effects as an antimicrobial, analgesic, antioxidant, analgesic, and diuretic. Other functions are helping hair growth, muscle relaxation, and accelerating the wound healing process (Manalu et al, 2020) .

Banana heart contains phytochemicals such as alkaloids, steroid polyphenols, and flavonoids that are effective in increasing milk secretion and ejection. The mechanism of action of lactogogum in increasing the rate of milk secretion is by stimulating protoplasmic activity in the secretory cells of the mammary gland and secretory nerve endings in the mammary gland, resulting in increased milk secretion. Lactogogum also stimulates the prolactin hormone, which plays a role in the lactation process in the mammary glands (Suyatno et al, 2020) .

The main phytochemicals in banana heart are flavonoids and saponins, which function as dopamine antagonists. By inhibiting the active pathway of dopamine through dopamine receptors, flavonoids and saponins increase prolactin secretion, resulting in increased breast milk production (Astari & Hardianti, 2022) .

In addition to increasing breast milk production, giving the heart of pisang kepok also has other benefits, such as healing blisters on the feet, providing a longer feeling of satiety, and can be used to make vegetables because of its protein and vitamin content. In the community, banana heart is generally processed by boiling, steaming, or diosengoseng (Zainuddin & Munadhir, 2020) .

Giving processed banana heart by stir-frying is given 2x / day (1 bowl) for 1 week in the form of stir-fry, banana heart is given as much as 200 grams for 7 days, with one cook for one meal (Pratiwi et. all., 2022) . The method of preparation is as follows, prepare the tools and materials of a pot, gas stove, spoon, food scale, banana flower, two shallots, two cloves of garlic, half (½) tablespoon of sugar, a quarter (¼) tablespoon of salt, three tablespoons of cooking oil. The preparation steps are as follows: selection of yellow kepok banana heart with purplish red color, no holes and pest-free, cutting into 2 parts to facilitate boiling, washing with running water and draining, blancing with boiling water for 2 minutes, banana flower then sliced thinly, sliced shallots and garlic, heat oil, add onions and garlic, cook until smelling, add sliced banana flowers, add salt and sugar wait for the spices to dissolve, stir-fry vegetables for 3-8 minutes, then remove and serve two meals a day as much as 200 gr (Dhey, 2016) , (Hasanah et. all, 2022) .

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Research Suharman et al. (2021) showed the effect of banana heart vegetable consumption on breast milk adequacy in nursing mothers in the Kalirejo Pesawaran Health Center Working Area in 2019 with p-value = 0.000. Similar results were also found in the study Zelharsandy & Soleha (2024) , which showed a positive effect of kepok banana heart consumption on increasing breast milk production in nursing mothers at RB Asri Palembang with p-value = 0.001.

According to the assumption of researchers, banana heart, especially the kepok banana type, contains lactogogum which plays a role in stimulating the prolactin hormone to increase milk secretion, as well as the oxytocin hormone to facilitate milk ejection. Phytochemicals such as flavonoids and saponins in banana heart work as dopamine antagonists, inhibiting the dopamine pathway to increase prolactin secretion. In addition, banana heart also provides additional benefits, such as antimicrobial properties, antioxidants, and accelerated wound healing.

Field observations showed that most breastfeeding mothers in the Rejosari Health Center working area were previously unaware of the benefits of banana heart. However, after trying it, they experienced a significant increase in milk production, with some mothers reporting an increase in milk production of up to 165 ml. Variations in body responses and physiological conditions of mothers may be a factor in the different results of increased milk production.

CONCLUSION

Research on the effect of banana heart consumption on breast milk production in nursing mothers in the working area of Rejosari Health Center, Pringsewu District showed significant results. In the intervention group, the average distribution of breast milk production before the intervention was 15 ml, which then increased to 86 ml after the intervention, with an increase of 71 ml. Meanwhile, in the control group, the average breast milk production before the intervention was 11 ml and increased to 25 ml after the intervention, with an increase of 14 ml. The analysis showed a significant effect of banana heart consumption on breast milk production with a p-value of 0.000. It is recommended that the theoretical development on banana heart in increasing breast milk production continues to be improved to enrich complementary care references in midwifery. Breastfeeding mothers are advised to pay attention to balanced nutrition, including banana heart consumption, as well as maintaining hydration, rest, and managing stress. Rejosari Health Center is advised to educate breastfeeding mothers about the benefits of banana heart through counseling. Aisyah Pringsewu University is expected to support further research and integrate this topic in the midwifery curriculum. Future researchers should expand the study with a larger and more diverse sample, and explore the physiological mechanisms and long-term effects of banana heart on milk production and maternal and infant health.

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