

Conservation of local resources: The role of kepok banana blossom in supporting breast milk production

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Abstract

Optimal production of breast milk is essential to support the health and development of babies. One of the efforts that can be made to increase breast milk production is through the nutrition of breastfeeding mothers. This study aims to determine the effect of consumption of banana kepok blossoms on breast milk production. The study was conducted at PMB Midwife Fitri, Ciamis, using a pre-test and post-test design in an intervention group consisting of 15 breastfeeding mothers. The results showed that the consumption of banana kepok blossoms could significantly increase breast milk production, from an average of 54 mL before the intervention to 99 mL after the intervention. These findings provide an alternative to natural ingredients-based nutrition to support breast milk production in breastfeeding mothers.

Keywords: banana blossom, breast milk, breastfeeding maternal nutrition

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INTRODUCTION

Breast milk (ASI) is a major source of nutrients that are very important for the growth and development of infants, especially during the first six months of life. Breast milk not only provides complete and easily absorbed nutrients but also contains bioactive substances that can boost the infant's immune system so that it can protect the baby from various infectious diseases. Based on data from the World Health Organization (WHO) in 2020, the coverage of exclusive breastfeeding in the world is still at 44% during the 2015-2020 period. Despite various promotional programs and interventions in Indonesia, exclusive breastfeeding coverage is still far from the target, reaching only 37.3% in 2018, according to the Indonesia Demographic and Health Survey (SDKI).

Similar challenges are experienced in Ciamis Regency, one of the West Java Province regions. The data from Open Data West Java in 2021 revealed that the coverage of exclusive breastfeeding in the regency only reached 48.22%. This figure shows that there are still many infants who do not get exclusive breastfeeding according to health recommendations, which has the potential to increase the risk of health problems in infants in this region.

One factor affecting the low coverage of exclusive breast milk is the problem of breast milk production in breastfeeding mothers. Suboptimal breast milk production often makes mothers feel unable to meet the needs of their infants, so they turn to formula milk or other complementary foods. To overcome this problem, nutritional interventions in breastfeeding mothers are very important. Research shows that good nutrient intake can increase breast milk production. One of the potential sources of nutrients to increase breast milk production is the banana kepok blossoms.

The banana kepok blossoms (*Musa paradisiaca*) is a part of the banana tree that is rich in nutrients, including vitamin B1, vitamin C, fiber, and minerals such as calcium and iron. The lactogogum content in banana blossoms is believed to stimulate breast milk production by increasing the secretion of the hormones prolactin and oxytocin, which play a role in the lactation process. In addition, banana blossoms also have high conservation potential because they are local food ingredients that are easy to obtain and are often not used optimally.

The use of banana kepok blossoms in the form of nuggets is an innovation that not only supports breast milk production but also supports efforts to conserve local resources. By processing banana blossoms into nuggets, this food becomes more practical and attractive to consume, especially for breastfeeding mothers who may need variety in their diet.

This study aims to examine the effect of the consumption of blossom nuggets of bananas kepok on breast milk production in breastfeeding mothers in the Ciamis Regency. It is hoped that the results of this research can provide practical and sustainable solutions to increase breast milk production, as well as support the conservation of local resources through the use of banana kepok blossoms.

METHODS

This study used a quasi-experimental method with a one-group pre-test and post-test design, where the same group was measured before and after the intervention was given. This design was chosen to evaluate the effect of the consumption of blossom nuggets of banana kepok on the production of breast milk (ASI) in breastfeeding mothers. The research was carried out in the work area of the Fitri Midwifery Independent Practice (PMB), Ciamis, for five months, from January to May 2022. This location was chosen because it has a sizable population of breastfeeding mothers and is geographically representative of local nutrition-related research.

The population in this study is all post-partum mothers on the 2nd to 7th day after giving birth who are in the PMB Midwife Fitri work area. Based on the preliminary study, it was estimated that there were about 15 breastfeeding mothers who met these criteria during the study period. The sampling technique used was probability sampling with the accidental sampling method, where samples were selected based on the ease of accessibility and availability of mothers who met the inclusion criteria during the study.

Inclusion criteria:

- a. Breastfeeding mothers who were on the 2nd to 7th day of postpartum.
- b. Mothers who were willing to participate in the entire series of research and give written consent
- c. Mothers who did not have a history of allergies to the food ingredients used in the blossom nuggets of bananas kepok.

Exclusion criteria:

- a. Mothers who experienced postpartum complications that affected breast milk production.
- b. Mothers who took medications that could increase or decrease breast milk production during the study.

This study used a one-group pre-test and post-test design approach. Before the intervention (pre-test), breast milk production was measured to obtain baseline data. After that, the intervention in the form of giving blossom nuggets of bananas was carried out for seven consecutive days, where breastfeeding mothers consumed nuggets every day at breakfast (between 08.00 and 10.00 WIB). After the intervention period was completed, breast milk production was measured again (post-test) to see the effects of the intervention given. On the first day, the researchers measured breast milk production using a standard observation sheet. This measurement included the volume of breast milk produced in a single breastfeeding session, measured in milliliters (mL). This data was used as a baseline for comparison with the results after the intervention. The intervention was carried out by giving kepok banana heart nuggets to breastfeeding mothers. Nuggets were made based on a standard recipe with the main ingredient of kepok banana blossoms, which were processed into nuggets. Each mother was asked to consume one serving of nuggets every morning for 7 days. Researchers ensured that the nuggets were consumed at the same time every day for consistency of results. After 7 days of intervention, the researchers again measured breast milk production in breastfeeding mothers using the same method as in the pre-test. The volume of breast milk produced was measured and recorded for later analysis. The data collected included the volume of breast milk production before and after the intervention, as well as the demographic characteristics of mothers (age, parity, education, occupation, and others). This data was recorded in an observation sheet that had been prepared beforehand. The collected data were analyzed using a paired t-test to compare

the average breast milk production before and after the intervention. This test was chosen because it was appropriate to analyze data from the same sample measured twice (before and after the intervention) to determine if there were any significant differences. The research technique was carried out by Direct Observation: The researcher directly observed and recorded breast milk production data in breastfeeding mothers before and after consuming the kepok banana blossom nuggets. Structured Interviews: Interviews were conducted to obtain additional information about mothers' experiences in consuming nuggets and their perception of changes in breast milk production. Observation Sheet: The main tool in the collection of data on breast milk production. This sheet was used to record the volume of breast milk produced as well as the mother's response to the intervention given. All participants in this study were explained the objectives, procedures, benefits, and risks of the study. Participants who agreed to participate were asked to sign an informed consent form as proof of their willingness to participate in the study. This research method was designed to ensure that the interventions provided could be evaluated objectively, with the results expected to contribute to efforts to increase breast milk production through the use of easily accessible local ingredients, such as banana kapok blossoms.

RESULTS AND DISCUSSION

This study aims to determine the effect of the consumption of banana kepok blossom nuggets on the production of breast milk (ASI) in breastfeeding mothers. Based on the results of measuring breast milk production before and after the intervention in a sample group consisting of 15 breastfeeding mothers, the following data were obtained:

Table 1. Breast Milk Production Before and After the Intervention

Indicator	Before the Intervention	After the Intervention	Increased
Average milk production (mL)	54	99	45 mL

The average milk production before the intervention was 54 mL per breastfeeding session. This data shows that most mothers experience relatively low milk production, which can affect exclusive breastfeeding to their babies. After the intervention in the form of the consumption of banana kepok blossom nuggets for seven consecutive days, the average milk production increased to 99 mL per breastfeeding session. This increase shows a positive effect of the consumption of blossom nuggets of bananas on breast milk production.

Table 2. Paired t-Test Statistical Test Results

Indicator	T value	Df	Sig. (2-tailed)
Breast Milk Production Before and After	-9.580	14	0.000

The paired t-test statistical test was used to compare the average milk production before and after the intervention. The test results showed a t-value of -9,580 with df (degree of freedom) = 14 and a significance value (p-value) = 0.000. A $p < 0.05$ indicates that there is a statistically significant difference between breast milk production before and after the intervention. In other words, the consumption of banana kepok blossom nuggets has been proven to significantly increase breast milk production.

The results of this study showed that the consumption of banana kepok blossom nuggets significantly increased breast milk production in breastfeeding mothers. Some factors that might contribute to this increase in breast milk production included the nutrient content of banana kepok blossoms and the ease of access and affordability of this ingredient as an additional source of nutrients.

The banana kepok blossoms are known to be rich in nutrients that are important for breastfeeding mothers. Among them are vitamin B1, vitamin C, fiber, and minerals such as calcium

and iron. These nutrients play a role in supporting the general health of breastfeeding mothers and contribute directly to the lactation process.

- a. Vitamin B1: Plays a role in energy metabolism and supports healthy nerve function, which is important for reducing stress in breastfeeding mothers, which in turn can increase milk production.
- b. Vitamin C: It has antioxidant properties that can help reduce oxidative stress in the mother, which also has the potential to positively affect breast milk production.
- c. Minerals (Calcium and Iron): Important for bone health and blood production, both of which are important during breastfeeding.

In addition, the heart of banana kapok blossoms contains lactogogum, a compound believed to stimulate the secretion of the hormones prolactin and oxytocin. Prolactin is a hormone that plays a major role in milk production, while oxytocin helps drain milk from the mammary glands to the nipples.

The presentation of banana kepok blossoms in the form of nuggets provided additional advantages in terms of acceptance and ease of consumption. Breastfeeding mothers might prefer to consume processed foods in a practical form, such as nuggets, as opposed to raw materials that require further preparation. Nuggets can also be stored longer and served quickly thus, they do not interfere with the routine of breastfeeding mothers who are often busy.

These findings have far-reaching implications, not only in terms of public health but also in efforts to conserve local resources. The use of banana blossoms as a food ingredient to increase breast milk production supported the use of local ingredients that may often be overlooked or not utilized optimally. This could lead to improved local economies and reduced reliance on commercial nutritional products that may not always be available or affordable. The use of banana kepok blossoms also supported local plant conservation efforts by providing added value to parts of the plant that are usually not fully utilized. Thus, this research not only contributes to improving maternal and child health but also supports sustainability and conservation practices at the local level. Although this study shows positive results, some limitations need to be considered. The sample used in this study was relatively small (15 breastfeeding mothers), so the results may not be widely generalized. In addition, this study only lasted for 7 days, so the long-term effect of consuming banana kepok blossom nuggets on breast milk production could not be thoroughly evaluated. Another challenge faced was the difficulty in ensuring mothers' compliance in consuming banana kepok blossom nuggets according to the set schedule. External factors such as the intake of other foods and the mother's health condition could also affect the results of the study. Further research was needed to evaluate the long-term effects of banana kepok blossom consumption on breast milk production. In addition, studies with larger samples and more comprehensive designs (e.g., randomized controlled clinical trials) were needed to confirm these findings and strengthen their validity. The study could also expand the focus to evaluate the cardiac effects of bananas on breast milk composition and its impact on the growth and health of infants.

CONCLUSION

Consumption of banana kepok blossom nuggets was effective in increasing breast milk production in breastfeeding mothers, with a significant increase in breast milk volume after the intervention. These findings provided practical and locally based alternatives to support breast milk production, as well as support efforts to conserve local resources. Further research is suggested to explore the long-term effects and broader implications of heart consumption of banana kapok in the context of maternal and child health.

Limitations and Future Direction

Sample Size: One of the primary limitations of this study is the relatively small sample size, consisting of only 15 participants. While the findings are promising, the small sample size limits the generalizability of the results to a broader population.

A larger sample size would provide more robust data and allow for more reliable conclusions. **Duration of Study:** The study was conducted over a short period of 7 days. While this timeframe was sufficient to observe initial changes in breast milk production, it does not provide insight into the long-term effects of consuming nugget jantung pisang kapok.

The short duration also limits the ability to observe potential side effects or changes in the composition of breast milk over time. **Controlled Variables:** Although the study attempted to control for external factors, such as diet and health status, other variables that could influence breast milk production, such as stress levels, sleep quality, and other dietary habits, were not fully controlled or monitored. These factors could have impacted the study's results and introduced potential confounding variables. **Self-Reporting and Compliance:** The study relied on participants' self-reporting for the consumption of the nugget jantung pisang kapok, which introduces the possibility of reporting bias. Additionally, ensuring full compliance with the consumption schedule was challenging, and deviations from the prescribed regimen could affect the accuracy of the results. **Geographical and Cultural Context:** The study was conducted in a specific geographical and cultural context, namely in Ciamis, West Java. The acceptability and effectiveness of nugget jantung pisang kapok may vary in different regions or among populations with different dietary habits or cultural perceptions of food.

Future research should also aim to explore the underlying biological mechanisms by which jantung pisang kapok influences breast milk production. Investigating how the specific nutrients and bioactive compounds in jantung pisang kapok interact with hormonal pathways involved in lactation could provide valuable insights for developing targeted nutritional interventions.

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Declarations

All participants provided written consent for the anonymous publication of their data and findings derived from the study. No personally identifiable information is disclosed in this publication.

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