



THE EFFECTIVENESS OF GALACTAGOGUE CONTENT ON BREAST MILK PRODUCTION: A SCOPING REVIEW

EFEKTIVITAS KANDUNGAN GALACTAGOGUE PADA PRODUKSI ASI: SCOPING REVIEW

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ABSTRACT

*Providing counseling to breastfeeding mothers and giving extras through the use of galactagogues to support the secretion process in breast milk production is one of the measures taken to boost breast milk production. This study aimed to investigate and evaluate previously published research on the effects of galactagogues on breast milk production. Inclusion criteria in this review included Indonesian or English language studies published in the last five years and focused on the efficacy of galactagogues on breast milk production. The structure of this scoping review is based on the PRISMA-ScR Checklist, as outlined by Arksey and O'Malley. Literature searches used three databases, namely Wiley Online Library, PubMed, and Science Direct—critical appraisal using the Joana Briggs Institute (JBI) Appraisal Tool. There were 343 relevant articles, and 10 were selected according to the researcher's criteria. The review results discuss that galactagogue content can affect mothers' milk from the duration and frequency of mothers consuming galactagogue content during breastfeeding. It was concluded that galactagogue content affects increased breast milk production, reinforced by banana flowers, *Coleus amboinicus* Lour, and local foods and plants containing galactagogues. In addition, how long galactagogues are used and their consumption frequency affect breastmilk production.*

Keywords: Galactagogues, breast milk production, breastfeeding mothers.

ABSTRAK

Pemberian penyuluhan pada ibu menyusui dan pemberian ekstra melalui upaya penggunaan galactagogum untuk mendukung proses sekresi dalam produksi ASI merupakan salah satu hal yang dilakukan untuk meningkatkan produksi ASI. Tujuan dari penelitian ini adalah untuk menyelidiki dan mengevaluasi penelitian yang diterbitkan sebelumnya tentang efek galactagogum pada produksi air susu ibu. kriteria inklusi dalam ulasan ini termasuk studi bahasa Indonesia atau Inggris yang diterbitkan selama lima tahun terakhir dan berfokus pada kemanjuran galactagogum pada produksi ASI. Struktur penulisan scoping review ini menggunakan PRISMA-ScR Checklist menurut Arksey and O'Malley. Pencarian literatur menggunakan 3 database yaitu Wiley Online Library, PubMed, Science Direct. Critical appraisal menggunakan Joana Briggs Institute (JBI) Appraisal Tool. Terdapat 343 artikel yang relevan dan 10 artikel yang dipilih sesuai dengan kriteria peneliti. Hasil review ini membahas terkait kandungan galactagogum dapat mempengaruhi air susu ibu dari durasi dan frekuensi ibu mengkonsumsi kandungan galactagogum selama menyusui. Kesimpulan disebutkan bahwa kandungan galactagogum berpengaruh pada peningkatan produksi ASI. Diperkuat dalam kaitannya dengan bunga pisang, Coleus amboinicus lour, serta makanan dan tanaman lokal yang mengandung galactagogum. Selain itu, lamanya waktu penggunaan galactagogum dan frekuensi konsumsinya berpengaruh pada peningkatan produksi ASI.

Kata Kunci: Galactagogum, produksi ASI, ibu menyusui

INTRODUCTION

The world plans to enhance children's growth, development, health, and survival by exclusively breastfeeding them for the first six months of their lives. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend that newborns receive only breast milk for the initial six months of their existence. Breastfeeding should be maintained until the child reaches a minimum age of two years to decrease the risk of infant morbidity and mortality. In 2018, the World Health Organization recommended that women exclusively breastfeed their babies for the first six months of their children's lives. Therefore, for infants to start nursing within the first hour of their existence, they should only receive breast milk and no other food or liquids, including water. They must continue to nurse on demand or as often as the baby likes, but instead of using a bottle or pacifier, they should go directly to their mother. (Aslamiah, 2021).

As stated by the Ministry of Health in the Republic of Indonesia, in 2016, the percentage of babies in Indonesia aged 0 to 6 months who only get nutrition from their mother's breast increased compared to the previous year. However, markers still need to be met to achieve this goal successfully. In 2019, the proportion of infants in Indonesia who were exclusively breastfed during the initial six months of their existence stood at 67.74%, but the country has yet to reach a target of 80% (Kemenkes RI., 2021).

Several things can hinder a mother's ability to exclusively breastfeed her child, including a mother's fear of losing her breasts, a mother's inability to work outside the home, and so on. Many variables, including sociocultural elements, information aspects, the influence of imitation on close friends or boyfriends, psychological factors, maternal health factors, maternal physical factors, behavioral factors, and health workers all play a role in determining whether a mother chooses to breastfeed her child exclusively (Aslamiah, 2021).

One of the supplementary techniques employed to boost milk production involves using galactagogues. Increasing the amount of breast milk produced and its production speed can be done using galactagogues. Various studies have shown that several food elements in Indonesia have advantages and function as galactagogues. It could serve as a solution to the failure of exclusive breastfeeding caused by insufficient secretion and production of breast milk. The study has been conducted in Indonesia (Gyamfi et al., 2021).

Galactagogues are used to promote, maintain, and stimulate breast milk secretion. Galactagogues

can be found in plant form or pharmaceutical drug form. Several factors need to be considered when using galactagogues, including efficiency, safety, and duration of use. Many galactagogues, including those found in drugs derived from plants or foods, are currently being used. These galactagogues have been proven to accelerate breast milk production (Sharma, 2021). Given these issues, the objective of this study is to ascertain whether the composition of galactagogues is beneficial or not in stimulating breast milk production while consumed by breastfeeding mothers.

METHOD

This study used a scoping review, combining several studies to synthesize and consolidate data comprehensively. It informs practices, programs, and policies and guides future research priorities (Matthew J. et al., 2021). The researchers used PRISMA-ScR as a reference for the literature review because PRISMA-ScR. The first is identifying the scope review question; the other four stages are as follows: 2. Determining whether these articles are relevant; 3. choosing the articles; 4. mapping out the data; 5. collating, condensing, and presenting the results (Matthew J. et al., 2021). Inclusion criteria in article selection are articles published within 5 years (2018–2022), articles used in this review in English and Indonesian, articles discussing galactagogues on breast milk production, and original research. Exclusion criteria in this review are reviews, books, opinion articles, grey literature, inaccessible articles, and non-full text.

The databases used to search for articles related to galactagogues on breast milk production were Wiley Online Library, PubMed, and Science Direct. All obtained articles were then entered into Mendeley software. Articles were searched using Boolean operators AND, OR or NOT and Truncation (*) as connectors in combining or excluding keywords for searching to obtain more focused and relevant results. The keywords used in the search process were effect AND galactagogues* AND breastfeed* AND breast milk production*. Researchers use Mendeley as reference management software in sorting out items like duplication, title selection, and filter processes described using systematic review meta-analyses (PRISMA) flowchart 2020 (Matthew J. et al., 2021), as follows:

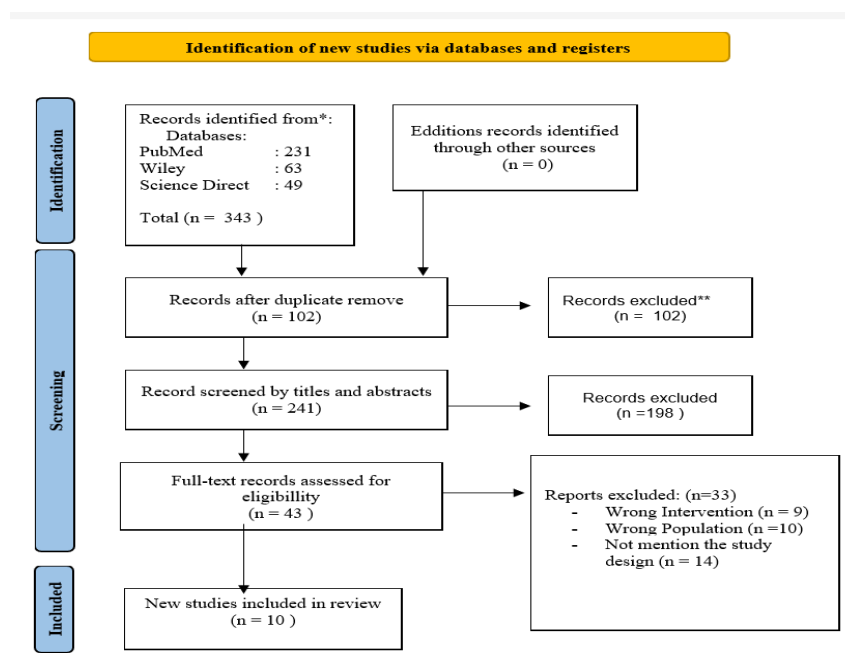


Figure 1. PRISMA flowchart 2020 (Matthew J. et al., 2021).

Table 1.
Data Charting

No	Auth ors/ Year	Coun try	Purpose	Research Method	Intervention Group	Control Group	Results
A1	(Yim yam & Patt ama porn pon g, 2022)	Thail and	The aim is to explore the clinical impact of banana heart galactagogues on breast milk production in mothers who have had cesarean section surgery.	Research with the RCT (randomized controlled trial) study method. Data collection uses questionnaires and observations.	Consumption of 100 ml (14 mg) of banana heart drink once a day for 7 days.	Mineral Water	In the experimental group, mothers who had cesarean surgery demonstrated a significantly increased rate of breast milk flow on the 2nd (p=0.017) and 3rd days (p=0.005), as well as a higher volume of breast milk on the 2nd (p=0.005) and 3rd days (p<0.001), in comparison to those in the control group.
A2	(Nasution et al., 2022)	Indon esia	The goal is to evaluate the efficacy of interventions using wake-up leaves on breast milk production in postnatal mothers and their health status during the COVID-19 pandemic.	It was a Control Group Pretest-Posttest Design with equivalent groups. The analytical test employed was the independent t-test. The Kolmogorov-Smirnov test serves as the parameter for testing normality.	Consumption of 100 grams three times a day for 7 days.	No treatment	The study demonstrated the impact of the intervention involving the consumption of wake-up leaves on breast milk production, as evidenced by an independent t-test with a p-value of 0.010. Furthermore, the intervention involving the consumption of wake-up leaves also affected the health condition of postpartum mothers, as indicated by a p-value of 0.001.
A3	(Prah esti et al., 2020)	Indon esia	The aim is to ascertain the impact of providing Indian Borage leaves (<i>Coleus Amboinicus L</i>) on prolactin levels and breast milk production in nursing mothers.	Using an experimental research method. With a quasi-experimental design. Sampling was done using a purposive sampling technique with 32 breastfeeding	Give a supplement of Indian Borage leaf tea once daily for 14 days.	No treatment	The findings of the study indicated that the addition of Torbangun leaf tea leads to a rise in prolactin levels (significance 0.014 (p<0.05)) and milk production (significance 0.046 (p<0.05)). The analytical outcomes suggest that Torbangun notably enhances prolactin levels and lactation. Therefore, nursing mothers can consider Torbangun a supplement to boost their prolactin levels

				mothers as samples. Data analysis uses univariate and bivariate tests using the Wilcoxon test.			and milk production.
A4	(Wulan & Br. Giriang, 2020)	Indonesia	This research aims to ascertain the impact of banana flowers (<i>Musa Paradisiaca L.</i>) on lactation.	The study employed an experimental approach featuring a quasi-experimental design. Data was gathered through questionnaires and observation forms. The technique for sample selection was probability sampling, particularly random sampling.	Given twice a day, 200cc each time, for 7 days of treatment.	No treatment	The breastfeeding process in the intervention and control groups showed a difference of 149.0, with a significant p-value of 0.01. It can be said that administering banana flowers (<i>Musa Paradisiaca L.</i>) can increase breast milk production.
A5	(Ali et al., 2020)	Ghana, Afrika	The aim is to identify and describe the various herbs and food components used to enhance lactation in two distinct regions of Ghana.	Cross-sectional study method Data collection: FGD, Questionnaire The research sample was 402 breastfeeding mothers. The sampling technique used purposive sampling.	Consumption 1 to 3 times a day. The duration of administration is not explained.	No control group	The use of lactogogues is prevalent at 83.8%, with these substances typically prepared separately from regular household meals (59.4%) and consumed between one to three times daily (89.6%). Users often perceive their effectiveness within the first 24 hours of usage (98.5%). The most frequently used lactogogues encompass peanut/bean soup made with Bra Leaves (<i>Hibiscus sabdariffa</i>), hot black tea, Werewere/Agushi (<i>Citrulus colocynthis</i>) prepared with Bra leaves, and Abemudro, a polyherbal formulation. However, only a small fraction of nursing mothers, 13.2%, utilized lactogogues during their pregnancy.

A6	(Moinika & Yunita, 2021)	Indonesia	This study aimed to examine the types of plants, forms of preparation, initiation, and duration of use, as well as empirical benefits and potential side effects of using Usada-based herbal galactagogues.	This research is exploratory. Data collection was done using questionnaires and in-depth interviews. The study sample consisted of 44 mother respondents who satisfied the eligibility criteria. The data was gathered using a purposive sampling method complemented by snowball sampling.	Administered for 30 days.	No control group	The research results showed 26 types of herbal galactagogue plants based on traditional medicine consumed in preparations: tutuh, loloh, and tampel. The majority of respondents (82%) started therapy postpartum, and the duration of consumption was < 1 month (36%). As many as 89% of respondents have a shorter breastfeeding duration and increased breast milk volume when pumping. About 95% of respondents feel confident and have sufficient breast milk strength after consuming herbal galactagogues.
A7	(Okinarum et al., 2020)	Indonesia	This study aimed to determine the potential of stone banana heart tea (<i>Musa Balbisiana Colla</i>) in increasing serum prolactin levels.	This experimental study employed a single-blind randomized control trial with a pretest-posttest control group design. The study involved 60 participants, evenly split between the intervention and control groups, with 30 in each. The collected data is processed with non-parametric tests, namely the Wilcoxon and Mann-Whitney tests because the data does not have a normal distribution.	Administered as 2 times consumption of perhasi tea for 7 days.	Administering tea (<i>Camellia sinensis</i>)	Breastfeeding mothers who consumed stone banana heart tea for seven consecutive days experienced a 30.85% increase in serum prolactin levels. A significant difference was observed in the serum prolactin levels between the intervention and control groups, with a p-value less than 0.05. Stone banana heart tea has a galactagogue effect that can increase serum prolactin levels during lactation.

A8	(McBride et al., 2021)	Australia	This study aimed to gain insights into Australian women's usage and experiences with galactagogues while breastfeeding.	The research used the cross-sectional study method. Data collection is done through interviews and questionnaires. The research sample is 1,876 respondents.	Administration of galactagogues for 2 to 20 weeks.	There is no control group.	Women indicated that they often received suggestions for herbal or dietary galactagogues from online sources (38%) or friends (25%). In contrast, General Practitioners primarily recommended pharmaceutical galactagogues (72%). Among all, domperidone was perceived as the most effective, with an average rating of 3.3 compared to other options, which ranged between 2.0 and 3.0.
A9	(Wulandari & Wardani, 2020)	Indonesia	To understand the overview of herbal medicine consumed by breastfeeding mothers in Wonosari, Gadingrejo, and Pringsewu in 2019.	The research used the descriptive study method with analytical survey methods. Data collection is done using primary data. The research sample is 120 respondents with a total sampling technique.	Consumption of galactagogues once a day starting from the first day of giving birth.	There is no control group.	Most respondents, 52 or 43.4 percent, used katuk leaves (<i>Sauropus androgynus</i>) to boost their breast milk production. This was followed by 38 respondents, or 31.6 percent, who consumed moringa leaves. Nine respondents, or 7.5 percent, consumed a mix of turmeric and tamarind, while three, or 2.5 percent, consumed turi leaves (<i>Sesbania grandiflora</i>). Four respondents, or 3.3 percent, consumed roasted corn, and the same number of participants, representing four percent, incorporated spinach into their diet.
A10	(Tan et al., 2022)	Malaysia	The primary objective of this research was to examine the extent of galactagogue usage among women who are breastfeeding within a diverse ethnic community.	Research using the cross-sectional study method. Data collection is done using a questionnaire. The sample size of the study is 322. All statistical analyses were performed using Stata version 13.	Consumed 1 to 3 times a day while breastfeeding.	There is no control group.	The majority of galactagogue use is food-based, with dates (66%), wheat (58%), and soybeans (56%) being the most commonly used. Each prominent ethnic group showed distinct galactagogue preferences: Malays preferred dates, Chinese favored soybeans, and Indians opted for wheat. Only one mother exclusively used pharmacological galactagogues. Around 65% of mothers who utilized galactagogues found them effective in enhancing breast milk production.

Data Item

The researchers identified each article relevant to the review topic of the effectiveness of galactagogue substances on breast milk production. Consuming foods containing galactagogues is one approach that can be utilized to boost breast milk production. Galactagogue content is found in several types of plants, and some are even made into pharmacological drugs. Several researchers have proven the virtues and benefits of plants containing galactagogues for increasing breast milk production.

Synthesis of Result

A total of 343 articles were obtained based on the three databases. From the PubMed database, 231 articles were found, Wiley 63 articles, and Science Direct 49 articles. Then Mendeley was used to import each article. 102 duplicate articles were excluded. In titles and abstracts, 198 articles did not match and could not display full text. After reading the article, there were 33 irrelevant articles: 9 had issues with intervention, 10 had population issues, and 14 did not match the study determined by the researcher. Ten relevant articles met the criteria for execution. Using a PRISMA Flowchart improves the quality of publication reports and forms the basis for other researchers' reporting.

RESULTS

Selection Of Sources Of Evidence

Based on the search results using the PICO framework keywords from three databases: PubMed, Wiley, and Science Direct. Then Mendeley was used to perform filtering procedures such as duplicates, abstracts, and completeness of article writing. The article selection flow uses a PRISMA flowchart to illustrate the stages of filtering the articles taken.

Characteristics Of Sources Of Evidence

In the 10 relevant articles, several characteristics distinguish the articles, including the name of the country and research methods. Article characteristics based on countries are developing countries (90%), such as Thailand, Africa, Indonesia, and Malaysia, and developed countries (10%), namely Australia. Article characteristics based on research methods are Quasi-experimental (30%), Qualitative (20%), Randomized Controlled Trial (20%), and Cross Sectional (30%).

Critical Appraisal Within Sources Of Evidence

There are 10 articles taken in this study using different research methods. All ten articles received perfect scores from the Joanna Briggs Critical Appraisal Tools (JBI) questions, which are used to evaluate each article critically.

DISCUSSION

Galactagogue Content

In this review, several articles discuss galactagogues' efforts on breast milk production, including Banana Heart, *Coleus amboinicus* Lour, and local foods and herbal remedies.

Banana Blossom (Musa x paradisiaca).

Banana blossom (*Musa x paradisiaca*) is a plant that contains galactagogues widely used in several countries, one of which is in Thailand (Yimyam & Pattamapornpong, 2022) Banana blossom contains galactagogues with estrogenic properties that can stimulate the growth of alveolar mammae and increase serum prolactin levels, cortisol levels, total prolactin, and

glycogen content (Ningrum et al., 2021).

In article A1, it is stated that there is a relationship between the administration of banana blossom (*Musa x paradisiaca*) consumed by mothers undergoing Caesarean section in the intervention group having a level of breast milk flow on the 3rd day ($p < 0.001$). Banana blossoms have a higher level of breast milk flow in breast milk output than the control group given plain water (Yimyam & Pattamapornpong, 2022). It was mentioned in article A4 that breastfeeding liquid administration in the treatment group and control group had a difference value of 149.0 with a p-value of 0.01, indicating significant differences between both groups as seen from child indicators. According to article A7, blood prolactin levels increased by 30.85% in breastfeeding mothers who drank tea from stone banana blossom for seven consecutive days. Drinking tea made from king banana flowers has been proven to have galactogenic effects, increasing blood prolactin levels. This effect is most noticeable in breastfeeding mothers (Okinarum et al., 2020).

Coleus amboinicus lour.

The leaves of the Indian borage plant (*Coleus amboinicus* lour), long believed by the Batak community in North Sumatra to enhance breast milk production, are also considered capable of augmenting breast size. There have been various strategies developed, both pharmacological and non-pharmacological, to increase the production of breast milk (Yuliani, 2021).

In article A2, it is mentioned that the efficacy of giving Indian borage leaves (*Coleus amboinicus* lour) on a mother's milk secretion can be known by giving as much as 100 grams of *Coleus amboinicus* lour leaves with a frequency once a day for one week for postpartum mothers (Nasution et al., 2022). According to article A3, it was reported that the supplementation of *Coleus amboinicus* lour tea significantly raised prolactin levels (with a significance value of 0.014, $p < 0.05$) and enhanced milk production (significance value of 0.046, $p < 0.05$). Therefore, Indian borage has a significant impact on increasing both prolactin levels and breast milk production (Prahesti et al., 2020).

This article is supported by further research stating that breastfeeding mothers who are given 150 grams of fresh Indian borage leaves have the potential to boost breast milk volume by as much as 65 percent between ages 14 and 28 days. Breastfeeding mothers with soup from 150 grams of fresh leaves can increase breast milk produced and baby weight at three to four months (Oktaviya et al., 2020).

Food and ingredients Local

The herbal tea concoction consumed by breastfeeding mothers from market concoctions with a mixture including sucrose, maltodextrin, 2.6% roselle extract, 0.5% L-ascorbic acid, 0.2% raspberry leaf extract, 0.2% fennel extract, 0.1% fenugreek extract, 0.1% goat's rue extract, and 0.02% fennel oil. Meanwhile, the herbal cumin and fennel were obtained by breastfeeding mothers from nearby sellers (Kurniati & Azizah, 2021). Moringa contains seven times more vitamin C than oranges, ten times more vitamin A than carrots, seventeen times more calcium than milk, nine times more protein than yogurt, fifteen times more potassium than bananas, and twenty-five times more iron than spinach (Sarni et al., 2020).

In article A5, it is mentioned that most mothers use galactagogues contained in food and local ingredients to increase breast milk production (67.7%), proving that special foods and chosen ingredients are utilized to enhance breast milk production (Ali et al., 2020). Article A6 was obtained from 95% of respondents who consumed herbal galactagogues felt confident and had self-power after using herbal galactagogues on confidence in breastfeeding (Monika & Yunita, 2021).

In article A8, it is said that Galactagogue administration, including giving beer yeast, fenugreek, and domperidone, 23% of domperidone administration experienced side effects compared to giving herbal galactagogues 3%. It proves that using domperidone has greater side effects than

giving galactagogues herbally (McBride et al., 2021). In article A9, it is mentioned that a majority of mothers consume katuk leaves (*Sauropus Androgynus*) to boost their breast milk production, with moringa leaves being the second most popular choice, consumed by 38 respondents, which makes up 31.6% of the group (Wulandari & Wardani, 2020).

In article A10, it is stated that the most frequently utilized galactagogues include dates (both palm and Chinese) at 66%, wheat at 58%, soybeans at 56%, and both spinach and ginger at 46%, garlic at 45% and fenugreek at 35%. On the other hand, lesser-known galactagogues include blessed thistle (92%), milk thistle (89%), nettle (89%), moringa (81%), asparagus (50%), carrots (42%), and shark(42%). Many mothers are unaware that metoclopramide (72%) and domperidone (70%) are medications used to boost breast milk production. This indicates that herbal plant-based galactagogues are more favored by mothers for enhancing breast milk production compared to pharmacological ones (Tan et al., 2022).

The Effect of Consuming *Galactagogue*.

Duration

Previous findings have shown that mothers often fail to consume a balanced diet regulating carbohydrates, fats, vegetables, and fruits that contain galactagogues, which can affect the breastfeeding mother's milk production (Pratiwi & Srimati, 2020). In articles A1, A2, A3, A4, A6, A7, and A8, it is mentioned that the duration of mothers consuming galactagogues in various studies varies from 7 days, 14 days, 30 days to 6-19 weeks. The recommended food composition includes galactagogues to enhance the secretion of protein, carbohydrates, and other galactagogues (Fitria et al., 2022).

Frequency

Breastfeeding mothers consume sweet cakes and drink sweet tea immediately after breastfeeding their babies (Kaliwile et al., 2019). In articles A1, A2, A3, A4, and A7, it is mentioned that the frequency of consuming galactagogues varies from once a day, twice a day, to three times a day, with different dosages in each study method. The correlation between a mother's diet and the production of breast milk is intimately intertwined, as the efficiency of breast milk production relies on the mother's nutritional intake. Therefore, better maternal nutrition can influence the quality of breast milk production (Sanima et al., 2017).

LIMITATION OF THE STUDY

The limitations of this scoping review study include the limited availability of articles on galactagogues, resulting in a small number of search results. Additionally, there is a limitation in the number of samples that used animals to measure the enhancement of breast milk production.

CONCLUSIONS AND SUGGESTIONS

Based on the articles obtained, it is stated that there is an impact on enhancing breast milk production following the intake of galactagogues, such as banana hearts, *Coleus amboinicus* lour, local foods, and herbal remedies. Additionally, the length of time and regularity of galactagogue consumption also play a role in breast milk production, like fulfilling the dietary requirements of nursing mothers. The intake of galactagogues over a period ranging from 7 days 30 days can influence an increase in breast milk production. However, each plant containing galactagogues has different effectiveness and dosage levels in enhancing breast milk production. Moreover, the more frequently a mother consumes foods that can affect breast milk production, like galactagogues, the more breast milk will be produced as her nutritional needs are met.

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ETHICAL CONSIDERATIONS

It is not an ethical review.

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Conflict Of Interest Statement

This review does not have any conflicts of interest.

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