

Full length Research Article

# The Types and Utilization of Galactagogues in Nigeria: A Case Study of People Residing in Lagos State.

\*Oyelowo O.T., Adejare A.A., Dieobi C.Z., Ajulo, O.A.

Department of Physiology, University of Lagos, Nigeria.

**Summary:** One of the factors characterizing suboptimal breastfeeding is insufficient human milk production. In most African settings, special food items are regularly used to promote human milk production. These food items, called galactagogues, are used in Nigeria, but their use is undocumented and the amount of intake among lactating mothers is unknown. The study aims to document galactagogue consumption habits and describe the food items some lactating mothers use in Nigeria. A cross-sectional study was conducted among 112 mothers who breastfed exclusively in Lagos Nigeria. A pretested, self-reported administered questionnaire was used. All data were coded in a computer program file. Qualitative data were presented as frequencies and percentages while quantitative data were represented as mean  $\pm$  standard deviation (SD). A  $p < 0.05$  was considered statistically significant. The most reported galactagogue was pap (80.8%). Others were tea (46.0%), milk (19.1%), and amala (9.5%). Information concerning galactagogues was mainly from the participants' mothers (35.9%), while media/ internet had little influence (4.2%). Galactagogues are common in Nigeria, and they signify an important part of the nutrition of lactating mothers. These results could contribute to the knowledge of breastfeeding activities in Nigeria and encourage further research to produce robust facts about galactagogues' safety and scientific efficacy to support evidence-based approaches and advance breastfeeding concerns.

**Keywords:** galactagogues, human milk, breastfeeding habits, pap, Nigeria

\*Authors for correspondence: [ooyelowo@unilag.edu.ng](mailto:ooyelowo@unilag.edu.ng), Tel: +234-8036733891

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## INTRODUCTION

The act of exclusively breastfeeding infants for the first 6 months of their lives cannot be overemphasized. This practice is recommended by the World Health Organization (WHO, 2003). An all-inclusive implementation plan on maternal, infant, as well as young child nutrition, was also endorsed by WHO. The plan itemized six global nutrition objectives that should be attained by the year 2025. The Resolution sought among other things to increase rates of exclusive breastfeeding among infants less than 6 months by at least 50% (WHO, 2014).

Exclusive breastfeeding is important to check infant malnutrition and prevent infant mortality in children under five years worldwide (Azaine *et al.*, 2015). Reduced danger of infant infections, protection against the development of Type-2 diabetes, obesity, and other non-communicable diseases, and benefits in the educational performance of school children are other advantages of breastfeeding (Krol and Grossmann, 2018). Breastfeeding culture is well-enshrined in various ethnic groups in Nigeria; however, the promotion of optimal exclusive breastfeeding practices has not been attained and should be encouraged (Akadri and Odelola, 2020).

The complex interplay between hormones, emotions, and physical factors is a key component of breastfeeding physiology. Inadequate human milk production is one of the important factors that increase the rate of suboptimal breastfeeding among lactating mothers (Masaba *et al.*, 2021, Huang *et al.*, 2022). There are reports of perceived human milk insufficiency across the globe (McBride *et al.*, 2021) and even in African countries like Nigeria (Akadri and Odelola, 2020). This perceived insufficient human milk production has resulted in different approaches like medication, herbal preparations, and intake of some food substances to solve the problem of inadequacy in human milk production.

Galactagogues (or Lactagogues) are substances used to assist initiation, maintenance, or augmentation of the rate of the mother's milk synthesis (Ali *et al.*, 2020). Galactagogues include pharmacological constituents, herbal medicines, and food preparations. There are however concerns about the safety of pharmacological galactagogues (Grzeskowiak *et al.*, 2019) while herbal medicines and food substances, however, have been suggested to be effective (Buntuchai *et al.*, 2017, Ali *et al.*, 2020). Different herbs and food-based substances are either eaten or used for medicinal purposes

around the world and in Africa. There are views that these practices of assisting the mothers' milk to flow exist in the local settings alone. This might not be correct as the migration of people from local settings to cities exists thus the information concerning galactagogue use would be available also in urban settings. The practices of galactagogue consumption in Nigeria are not documented or preserved. This study aims to identify the food items and herbs used by lactating mothers as well as to scientifically document galactagogue consumption practices among lactating mothers in Lagos, a cosmopolitan city that accommodates people from different geopolitical zones in Nigeria. The outcomes from this study could help to understand the level of usage and stimulate further study into the scientific competence of common foods and herbs used as galactagogues.

## MATERIALS AND METHODS

**Study Design, Setting, Sampling:** This study is a cross-sectional study using self-report surveys and researcher-administered surveys that involved the administration of questionnaires to record the specific galactagogues used, usage frequency, and perceived effectiveness. This study was conducted in Lagos State in the South-West geopolitical zone of Nigeria. Different ethnicities reside in Lagos, but the people still have a traditional lifestyle, with traditional foods and traditional pregnancy and postpartum practices even though Lagos is a sophisticated city. The mothers and their infants visited the hospitals for primary nursing care, routine vaccines, etc.

Lactating mothers who are Nigerians living in Lagos were eligible for this study. One hundred and twelve (112) breastfeeding mothers ages 20-50 years and their infants, (0-24 months) took part in the study. The selected sample was based on the following criteria. The mothers who had full-term infants, and who volunteered, participated in the study. The mothers were exclusively breastfeeding at the time of the survey, and some had other babies whom they had breastfed before this survey. No monetary compensation was given to participants.

**Data Collection:** A self-administered questionnaire was used to collect demographic characteristics, specific galactagogues used, usage frequency, perceived effectiveness, and information on galactagogues use and experiences of galactagogue use among lactating mothers practicing exclusive breastfeeding. The number of galactagogues utilized and the number of people from whom the experiences were learned could both be freely mentioned. The data were collected between August and November 2019. The study took place at a Teaching Hospital as well as two Private Clinics in Lagos, Nigeria. The participants signed an informed consent form before the interview. The section of the questionnaire on food items recorded the frequency and type of galactagogues consumed during the last 2 months. The mothers exclusively breastfed during the last 2 months parallel to the time that galactagogues were consumed. The list of foods was compiled according to texture and type.

**Data Analysis:** All data were coded in a computer program file (STATA Statistical software, version 15.0). Presentation of the quantitative data was by simple statistics of frequencies, percentages, and mean with standard deviation (SD) used to categorize the variables. Food items were classified by similar nutrients.

**Ethical Considerations:** Ethical approval CMUL/HREC/11/22/1125 was obtained from the College of Medicine, University of Lagos Ethical Review Committee. Written informed consent was obtained from the participants before the interview.

## RESULTS

**Maternal Demographic Characteristics:** The general characteristics of the mothers are presented in Table 1. The mean age of the mothers was  $33.7 \pm 6.7$  years. The mothers with a total of one child had the highest percentage (34.8%) and whose pregnancies got to term and resulted in breastfeeding. The participants with bachelor's degrees were (50.8%), while those employed were (62.5%).

**Table 1**  
General Characteristics (N=112)

Characteristics	N (%)	
Mother's age (years)	< 34	59 (52.6)
	> 34	53 (47.3)
Family status	Live with spouse	108 (96.4)
	Live with unmarried partner	2 (1.7)
	Single mother	2 (1.7)
Education attainment	Less than bachelor's degree	38 (33.9)
	Bachelor's degree	57 (50.8)
	Postgraduate degree	17 (15.1)
Employment status	Employed	70 (62.5)
	Self-employed	23 (20.5)
	Unemployed	19 (16.9)
Number of parities resulting in breastfeeding	1	39 (34.8)
	2	35 (31.2)
	3	21 (18.7)
	4	14 (12.5)
	5	2 (1.7)
	6	1 (0.8)
Region of Origin	North Central	8 (7.2)
	South East	17 (15.4)
	South South	30 (27.2)
	South West	53 (48.1)
	Didn't say	4 (3.57)

**Galactagogue Food Items Used Among Lactating Mothers:** The food items were classified into four groups: the galactagogues in liquid forms, the galactagogues taken as food, the galactagogues prepared as soups, and another group that included hot foods, fruits, vegetables, and local spices. The drinks-related galactagogues included pap (80.8%), tea (46.0%), water (17.3%), and milk (19.1%). The food-related galactagogues included Amala (9.5%), Pounded yam (6.0%), Yam (5.2%), and Rice (2.6%). The soup-related galactagogues included Pepper soup (8.6%), Bitterleaf soup (5.2%), and Ewedu (Jute) soup (4.3%). The foods listed under 'others' included Fruits at (8.6%), Vegetables at (2.6%), and Hot foods at (1.7%) (Table 2).

**Table 2**

Classification of the food items used as galactagogues (N=115)

Class of galactagogues		N (%)	
Drinks	Pap	93 (80.8)	
	Tea	53 (46.0)	
	Water	20 (17.3)	
	Malt Drink	1 (0.8)	
	Fluids	10 (8.6)	
	Milk	22 (19.1)	
	Yogurt	2 (1.7)	
	Soybean products	1 (0.8)	
	Palm wine	9 (7.8)	
	Kunu	4 (3.4)	
Food	Pounded yam	7 (6.0)	
	Amala	11 (9.5)	
	Yam	6 (5.2)	
	Ice-cream	1 (0.8)	
	Fufu	1 (0.8)	
	Semovita	3 (2.6)	
	Rice	3 (2.6)	
	Soups	Pepper	10 (8.6)
		Banga	1 (0.8)
White		1 (0.8)	
Bitterleaf		6 (5.2)	
Ewedu (Jute)		5 (4.3)	
Others	Hot foods	2 (1.7)	
	Fruits	10 (8.6)	
	Vegetables	3 (2.6)	
	Local spices	1 (0.8)	
	Tiger nut+coco nut+date	1 (0.8)	
	Tigernut only	1 (0.8)	
Moringa	1 (0.8)		

**Galactagogue Experiences:** The galactagogue food items were learned from different experiences of people as follows: Mothers (35.9%), Health workers and Antenatal programs (14.7%), Personal experience (10.5%), Friends (10.5%), Past and present nursing mothers (6.3%), Grandmothers (5.6%), social media/internet (4.2%) (Table 3).

**Experience and Reasons for slow milk let down:** The responses to the reasons for slow milk let-down are as follows: some mothers had no idea (28.9%), others said it was due to being a first-time mother (5.2%), the poor diet of the lactating mothers (12.2%), illness (10.5%), stress (7.8%). Of some lactating mothers, (61.3%) had personal experience of slow milk let-downs, while others learned about it from experienced family and friends (57.6%) (Table 3).

**DISCUSSION**

In Nigerian cultures, there are pregnancy and postpartum practices mothers observe strictly (Alabi, 2022). This includes mothers shunning certain foods like okra, and roasted plantain but eating other selected foods like fruits, vegetables, and carbohydrate foods to aid maternal and infant health. This study investigated the foods used to increase lactation and the perceived efficacy of galactagogue practices among Nigerians living in Lagos State who were from various geopolitical zones in Nigeria. The investigators found that there is an awareness of the use

of selected foods widely used to aid human milk production in Nigeria and that these foods constitute a vital part of the diet of the mothers. This is comparable to an Australian study (Brodrribb, 2018).

**Table 3**

Factors related to the use of galactagogues to enhance breastmilk production

Variable	N (%)
<b>Where did you learn about the use of special drinks, foods, and other substances for breast milk production? (N= 142)</b>	
Mother	51 (35.9)
Health workers & Antenatal programs	21 (14.7)
Personal experience	15 (10.5)
Friends	15 (10.5)
Colleagues at work	5 (3.5)
Past & Present Nursing mothers	9 (6.3)
Grandmothers	8 (5.6)
Mother-in-law	3 (2.1)
Sister-in-law	2 (1.4)
Popular saying	1 (0.7)
Sisters	2 (1.4)
Social media	6 (4.2)
Poster	1 (0.7)
Clergy	1 (0.7)
Herb sellers	1 (0.7)
Family	1 (0.7)
<b>Experience of slow milk letdown (N=118)</b>	
Personal	65 (61.3)
Family/Friend	53 (57.6)
<b>Reasons for slow milk letdown (N=114)</b>	
No idea	33 (28.9)
First-time mother	6 (5.2)
Poor diet of lactating mother	14 (12.2)
Body make-up	4 (3.5)
Illness	12 (10.5)
Stress	9 (7.8)
Mode of delivery	2 (1.7)
Delay in breastfeeding because of a sick child	1 (0.8)
Others	33 (28.9)

The consumption of pap stood out having been reported by the largest percentage of participants. Pap is a cereal pudding made from corn, millet, or sorghum. The cereal to be used is soaked for a few days to allow it to be softened after which it is washed in cold water and milled to an extremely smooth paste. With the aid of a sieve, the pureed corn is run through with lots of water. After which it is prepared with hot water and served hot. It is taken in liquid form. Corn-based preparations have recently been reported to act as galactagogues which could be used to stimulate milk production in lactating women (Azevedo et al., 2022). Amala is a local indigenous food native to the Southwestern part of Nigeria. Amala, which is made from yam, cassava, or plantain flours is cooked and eaten along with soups like Ewedu soup and meat or fish. Saponins, and flavonoids, have been reported to be the major phytochemicals in yam (*Dioscorea alata*), cassava (*Manihot esculenta*) (Olaniyan and Ajayi, 2021), and plantain (*Musa paradisiaca*) (Arun et al., 2017), used in making the flour cooked into Amala. The

participants also mentioned pounded yam, yam, and fufu also made from yam and cassava respectively as galactagogue food substances. The reported mechanism of action of these phytochemicals is that they raise milk production by acting as dopamine antagonists (Buntuchai *et al.*, 2017).

Phytochemicals, saponins, tannins, polyphenols, isoflavones, and alkaloids impact milk production because they stimulate milk ejection, improve milk protein levels, and improve lactation by increasing prolactin levels. Hypotheses exist that galactagogues might raise milk volume through an estrogenic effect (Buntuchai *et al.*, 2017). First, phytoestrogens have been reported to function as dopamine antagonists by preventing the pathway triggered by a dopamine receptor and increasing prolactin secretion to bring about milk production. Second, phytoestrogen from galactagogue origin has been reported to bind with receptors in the mammary glands to induce alveolar cell propagation. The anterior pituitary lactotrophic cells and phytoestrogens then bind with a  $\beta$ -estradiol receptor through an  $\alpha$ -isoform of the membrane-associated estrogen and this may induce prolactin gene expression (Buntuchai *et al.*, 2017).

A study has shown significant correlations between carbohydrate intake and milk volume (Czosnykowska-Łukacka *et al.*, 2018). Pap, amala, pounded yam, fufu, semovita, and rice are energy-giving foods and are taken several times a day and this aligns with a study that suggested that mothers should not consume less than 1600 kcal per day because it predisposes to a reduction in milk production (Marangoni *et al.*, 2016).

In line with another study (Ali *et al.*, 2020), participants interviewed in this study, indicated that yogurt, milk, and soybean products were galactagogue food items. It is believed that foods high in protein can explain the lactogenic effect since they offer a supply of fatty acids for human milk production or through the action of specific amino acids which are absorbed into the bloodstream and synthesized into milk proteins like casein and whey in the mammary glands (Ali *et al.*, 2020). In contrast to a study conducted in the United States that revealed intense awareness of the use of fenugreek (an herb) to enhance human milk production (Bazzano *et al.*, 2017), it was observed that participants in this study indicated dietary items with little emphasis on herbs (Moringa). Some participants mentioned palm wine as a form of galactagogues, however given its high alcohol concentration, this should be avoided during breastfeeding. According to research findings by Buntuchai *et al.*, (2017) that support this study, there is a belief in Nigeria that consuming fruits and vegetables helps assist milk letdown. Flavonoids and saponins are found in soups such as white soup, ewedu, bitter leaf, pepper in pepper soup, and various ingredients in Banga soup (Hamzah *et al.*, 2013). Barley used in making malt beverages, as well as tea, and kunu are high in phenol, saponins, and flavonoids (Kris-Etherton and Keen, 2002, Raj *et al.*, 2023) suggesting they assist in milk letdown.

Certain participants made hints about the need to consume galactagogue foods while they are hot. Food items suggested to be consumed hot include pap, tea, amala, pounded yam, semovita, and soups. The explanation for this was that these foods either quickly increase blood

circulation or stimulate circulation to let down milk more quickly (Ali *et al.*, 2020).

According to this study, participants primarily learned about certain galactagogue foods from their mothers and other family members, which is in line with findings from another study (Ali *et al.*, 2020). Some other studies, however, have indicated that their primary source of information on galactagogue foods was the internet and social media (Bazzano *et al.*, 2017, McBride *et al.*, 2021) which runs counter to the results of this study. Health professionals served as the primary information source according to other studies (Steyn *et al.*, 2017). In this present study, it was observed that most cultures pass on information about postpartum experiences from generation to generation. These postpartum experiences include knowledge of human milk production when it is in low supply to the baby. This generational transfer of information is due, in part, to the fact that family support is evident during lactation, which is in line with other research (Agunbiade and Ogunleye, 2012, Akadri and Odelola, 2020). Additionally, even though the participants gave birth and visited hospitals after giving birth, this study demonstrates that some aspects of the participants' culture remain preserved despite the demands of modern life. When compared to the overall percentage of participants who received knowledge on galactagogue food ingredients from family members, the proportion of participants who received information from health professionals and prenatal programs was lower.

In this study, some participants reported that they experienced slow milk letdown. The galactagogue food items were thus employed as a cure for this set of participants. These foods are however mostly included in the standard postpartum diet. This is consistent with research from other parts of Nigeria where low milk production was reported (Agunbiade and Ogunleye, 2012, Akadri and Odelola, 2020).

A study found that participants with higher levels of education knew more about breastfeeding (Dukuzumuremyi *et al.*, 2020). A significant portion of the participants in this study had bachelor's or postgraduate degrees, and a few of them were aware of the causes of the delayed milk letdown. It is common knowledge that a mother's health and ability to produce milk are impacted by her nutritional state. It is also commonly recognized that oxytocin, which aids in the induction of milk ejection, is inhibited by stress, anxiety, and related causes. Consequently, some participants' perceptions were accurate.

This study's findings are necessary for documentation to enlighten nursing mothers. Healthcare providers also require knowledge about galactagogue foods and views of efficacy to assist them in producing content for educational initiatives aimed at lactating mothers which may be utilized during pregnancy or postnatal visits. This is crucial due to the high regard for efficacy in these goods, which lack any sort of well-known scientific evidence. Awareness about palm wine for example as a galactagogue should be discouraged because of its alcoholic content that could harm the infant. The other galactagogue food items acknowledged in this study could be conjectured as safe as these food items are commonplace in Nigeria and appear to be healthy and this could signify some level of safety. There is thus the need for further research to determine their level of efficacy and

safety. To encourage mothers with sluggish milk letdown to seek professional support rather than rely entirely on their beliefs and practices to improve efficient breastfeeding, it is also crucial for healthcare professionals to be aware of these beliefs.

The exclusion of women who were not presently breastfeeding, likely introduced some prejudice in galactagogue habits, because practices of current lactating mothers and non-lactating women, may differ.

In conclusion, the use of galactagogue food items widely used to boost human milk production is commonplace in Nigeria and these food items constitute an important part of the nutrition of lactating mothers. The study into these galactagogue-containing foods could contribute to comprehending breastfeeding practices and inspire advanced research into the efficacy and safety of these food items available in Nigeria.

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