Nutrition intake for smooth milk production in breastfeeding mother

Husnah

Faculty of medicine, Universitas Syiah Kuala, Banda Aceh - Indonesia

ARTICLE INFO

Keywords:
Balanced nutrition, Breastfeeding, Breastfeeding others, Nutrition

ABSTRACT

Introduction: Nutrition is an organism’s process of using food that is normally consumed through the process of digestion, absorption, transportation, storage, metabolism and excretion of substances that are not used to maintain life, growth and normal function of organs and produce energy.

Main Text: Mother's milk is the right food source for babies, especially in the first month, which contains many important nutrients needed by babies to provide energy. Balanced nutrition for breastfeeding mothers must meet the needs for themselves and for the growth and development of the baby. Fulfillment of nutrition for breastfeeding mothers is the principle of fulfilling balanced nutrition. Balanced nutrition during breastfeeding is a very important requirement for breastfeeding mothers.

Conclusion: Nutrition in nursing mothers is closely related to the production of breast milk which is needed for the growth and development of the baby.

INTRODUCTION

In Indonesia, around 37% or 9 million children under five are stunted and Indonesia is the country with the fifth largest prevalence of stunting in the world. One of the causes of stunting in children aged 0 - 6 months is 60% due to not getting exclusive breast milk (ASI) and two out of three children aged 0 - 24 months do not get complementary food for breast milk (MPASI). The breastfeeding period is very good for the physical and mental health development of the child and mother. During breastfeeding, mothers are advised to increase their intake of calories, protein, vitamins, minerals, iron, calcium and folic acid so that nutritional needs can be met during breastfeeding. Several studies show that children who are not given exclusive breast milk are 38.89 times more likely to suffer from stunting. Nutrition is a process of organisms using food that is consumed normally through the process of digestion, absorption, transportation, storage, metabolism and excretion of substances that are not used to maintain life, growth and normal function of organs and produce energy (KEMENKES RI, 2022).

According to the Indonesian Law Number 36 of 2009 which was decided by the Minister of Women's Empowerment regarding health, namely that babies have the right to receive breast milk (ASI), during breastfeeding the family, local government and the community must fully support the mother and baby by providing time and special facilities, that there are still many babies who do not get breast milk for various reasons which result in children not getting...
enough nutrition and decreased immunity in babies. Mother’s milk is the right food source for babies, especially in the first month, which contains many important nutrients needed by babies to provide energy. Breast milk is also the best food that can be given to babies from birth. The nutritional content in breast milk is complete, easily digested and absorbed efficiently by the baby. Breast milk also contains immunoglobulin for the baby’s immunity (Ari Madiyanti et al., 2020).

Breast milk is a fat emulsion in a solution of protein, lactose and organic salts secreted by the mother’s mammary glands as the baby’s main food. Factors that influence the composition of breast milk include lactation stage, race, nutritional value and mother’s diet. According to the stages of breastfeeding, breast milk is colostrum, transfer milk and mature (natural) milk (Hastuti, 2014). WHO and UNICEF recommend that exclusive breastfeeding is food with the best nutritional content and the most perfect main food source for babies aged 0-6 months. Various studies have proven that exclusive breastfeeding for 6 months is proven to reduce the risk of various infectious diseases (diarrhea, respiratory infections, ear infections, pneumonia, urinary tract infections) and other diseases (obesity, diabetes, allergies, inflammatory indigestion, cancer) later in life. Because breast milk can increase the body’s immunity and meet all the nutritional intake needed by the baby (PERMENKES RI, 2014).

According to the United Nations International Children’s Fund (UNICEF), children who are exclusively breastfed survive the first six months 14 times more often than children who are not breastfed. Breastfeeding also supports a child’s learning and helps prevent obesity and chronic disease in the future. Recent studies in the United States and United Kingdom show significant savings in health care because children who are breastfed get sick much less often than children who are not breastfed (Hastuti and Tri Wijayanti, 2017).

Based on WHO (2020), the coverage of exclusive breastfeeding worldwide is only around 39% since the 2014-2019 period. Based on data from the United Nations International Children’s Emergency Fund (UNICEF), only 3% of mothers give exclusive breastfeeding for 6 months and the coverage of exclusive breastfeeding in Indonesia only reaches 55%. According to the 2020 Indonesian Demographic and Health Survey data, there are 35,685 postpartum mothers experiencing problems with expressing breast milk and in 2021 postpartum mothers experiencing problems expelling breast milk are 77,231 or 37.12% (SKDI, 2021). This shows that babies in Indonesia still lack exclusive breastfeeding for 6 months the needs for themselves and for the growth and development of the baby (Endah and Oktavianti, 2014).

The nutritional needs of breastfeeding mothers are greater than the nutritional needs of non-breastfeeding mothers. Food consumption must still be varied in amount and proportion. During breastfeeding, the mother must increase the amount and type of food consumed, namely to meet the needs of the mother and the need to produce breast milk. If the mother’s daily diet does not contain enough of the nutrients needed, such as fat cells as a source of energy and iron as a substance to form red blood cells, then the need for these substances in producing breast milk to meet the needs of the baby will be taken from the existing supply in the body. Mother In contrast to fat cells and iron, the baby’s need for vitamin B and vitamin C which is met through breast milk production cannot be taken from the supply in the mother’s body, but must be met from the mother’s daily food consumption (PERMENKES RI, 2014).
**MAIN TEXT**

**Nutritional Status of Breastfeeding Mother**

According to Widya Karya National Food and Nutrition, the nutritional needs of breastfeeding mothers can be guided as stated in the table of Nutritional Adequacy Rates (AKG) for breastfeeding mothers. Calculating calorie needs can also use the Harris Benedict Equation formula by calculating Basal Energy Expenditure (BEE) then correcting for nutritional status, age, gender, activity, pregnancy, breastfeeding and infections. For breastfeeding mothers, there is an additional 500 kcal of calories (Hardinsyah *et al.*, 2013).

Milk secretion averages 800-850 ml a day and contains 60-65 kcal calories, 1.0-1.2 gram protein q n 2.5-3.5 gram per 100 ml. These components are taken from the mother's body and must be replaced by the mother's food supply. The additional energy requirement for breastfeeding mothers is 800 calories a day and the additional protein requirement is 25 grams a day, above the mother's needs if she is not breastfeeding. The child's needs are taken from the mother's body, regardless of whether the mother herself has an adequate supply or not of these nutrients. Below this threshold, if the mother's consumption is insufficient, the levels of nutrients in breast milk will be affected by the mother's intake and appear to decrease if the mother is deficient. Specifically for protein, even though the mother's consumption is insufficient, breast milk still provides the ration needed by the child which is taken by sacrificing the mother's tissue (KEMENKES RI, 2022).

**Factors Affecting Nutritional Status in Breastfeeding Mothers**

There are several factors that can affect the nutritional status of breastfeeding mothers, namely: (Purwanto and Sumaningsih, 2019).

1. Breast-feed
   
   During pregnancy, high concentrations of estrogen lead to extensive development of ducts while high levels of progesterone stimulate formation of alveolar lobules. Increased concentrations of prolactin and human chorionic somatomammotropin also play a role in inducing the formation of enzymes needed to produce milk. High concentrations of estrogen and progesterone during the last half of gestation prevent lactation by inhibiting the stimulatory effect of prolactin on milk secretion. Prolactin is the main stimulant for milk secretion.

   After delivery, lactation is maintained by two important hormones: (1) prolactin, which acts on the alveolar epithelium to increase milk secretion, and (2) oxytocin, which causes forced expulsion of milk from the alveolar lumen through the ducts. In a breastfeeding mother, there are 2 reflexes that each play a role, namely the prolactin reflex and the letdown reflex (*milk ejection reflex*).

2. Nutritional needs of breastfeeding mothers

   The nutrients required during lactation depend on the volume and composition of the milk produced and on the initial nutritional needs and status of the mother. Among women who exclusively breastfeed their babies, energy requirements during breastfeeding exceed those before pregnancy. Conversely, some nutrients, such as iron; needs will be lower during breastfeeding than during pregnancy.

3. Disease
Pain causes a person's body to be in a hyper metabolic state. This situation occurs due to increased stress on the body. Rapid breakdown of body mass (protein catabolism), thereby increasing the risk of malnutrition if the increased demand is not balanced with food intake. During illness, there will be a release of pro-inflammatory cytokines such as Tumor Necrosis Factor, Interleukins 1 and 6, C-Reactive Protein, catecholamines, glucogen, and cortisol. Although high-stress patients have elevated insulin levels, the insulin-resistant state prevents the anabolic effects of insulin.

4. Activity
Research states strenuous activity can increase total energy use in lactating women. Mothers who exclusively breastfeed 9-24 weeks who occasionally do activities with those who are trained turn out to have a difference of 729 kcal/day. The active group, in this case exercise, spent an average of 88 minutes/exercise, the exercises carried out were mostly aerobic types. But the volume of breast milk produced is not a big difference.

5. Socioeconomic and cultural
Social and economic status have an important role on a person’s nutritional status. Education for breastfeeding mothers also affects knowledge, especially low knowledge of the importance of additional intake during breastfeeding. In addition to knowledge, customs and culture also influence women to take care of themselves after giving birth. Economic status such as income affects purchasing power to meet appropriate nutritional needs. In addition to income, a clean living environment helps prevent breastfeeding mothers from contracting infectious diseases.

6. Genetics
Factors or heredity have a big role on nutritional status apart from other factors. We cannot change this genetic factor because it is obtained from both parents. Therefore, it is necessary to pay attention to genetic factors from parents when assessing the nutritional status of infants.

7. Hormonal
Changes in body weight and composition in response to the metabolic load due to lactation have a high variation among the world’s population. The mean weight loss did not differ between breastfeeding and non-breastfeeding mothers. Despite hormonal differences in breastfeeding and non-breastfeeding mothers, only short-term differences were observed regarding postpartum body composition changes. Patterns of local fat deposition and transfer did not differ between lactating and non-breastfeeding mothers in most studies.

Balanced Nutrition Suggestion for Breastfeeding Mothers
There are several balanced nutrition messages for breastfeeding mothers, namely: (PERMENKES RI, 2014; Hardinsyah et al., 2013).

1. Get used to consuming a wider variety of food
Breastfeeding mothers need to consume a wider variety of foods to meet their needs for energy, protein and micronutrients (vitamins and minerals) because they are used to maintain maternal health and milk production. Protein is also needed for the synthesis hormone prolactin (to produce breast milk) and the hormone oxytocin (to secrete milk). Micronutrients needed during breastfeeding are iron, folic acid, vitamins A, B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), vitamin C, vitamin D, iodine, zinc and selenium. Deficiency of these nutrients in
The mother causes a decrease in quality of breast milk.

The need for protein during breastfeeding increases. This increased need to maintain maternal health. It is highly recommended to consume food sources of animal protein such as fish, milk and eggs. The need for iron during breastfeeding increases because it is used for the formation of new cells and tissues. In addition, iron is an important element in the formation of hemoglobin in red blood cells. Deficiency of hemoglobin called anemia can endanger the mother's health and increase the risk of death. Breastfeeding mothers who suffer from anemia as a result of iron deficiency during pregnancy, are also advised to take iron tablets in consultation with a nutritionist and/or doctor.

The need for folic acid increases because it is used for the formation of cells and the nervous system, including red blood cells. Green vegetables such as spinach and beans contain lots of folic acid which is very necessary during breastfeeding.

The need for calcium increases during breastfeeding because it is used to increase the production of breast milk which contains high calcium. If calcium consumption is insufficient, the mother will experience bone and tooth loss because the calcium reserves in the mother's body are used for milk production.

Good sources of calcium are milk, yogurt, cheese, anchovies, nuts, tofu and green vegetables. The absorption of calcium in food will be better if the mother gets used to basking in the sun in the morning. Vitamin C is needed by nursing mothers to help absorb iron from plant foods, while vitamin D is needed to help absorb calcium.

2. Drink more water

Water is the best liquid for optimal body hydration. Water functions to aid digestion, remove toxins, as a constituent of cells and blood, regulate the body's acid-base balance, and regulate body temperature. The amount of water consumed by breastfeeding mothers per day is around 850-1,000 ml more than mothers who are not breastfeeding or as much as 3,000 ml or 12-13 glasses of water. This amount is to be able to produce about 600-850 ml of milk per day.

3. Limit drinking coffee

The caffeine contained in the coffee consumed by the mother will enter the breast milk so that it will have an adverse effect on the baby, for example the baby has difficulty sleeping and iron metabolism disorders in nursing mothers. This is because the baby's metabolism is not ready to digest caffeine. Consumption of caffeine in nursing mothers is also associated with a low supply of breast milk. The main principles that are recommended related to the consumption of caffeine or coffee for breastfeeding mothers are 1) if the mother is not used to drinking coffee, she should not drink coffee during the breastfeeding period; 2) if the mother usually drinks coffee it is recommended to reduce or avoid drinking coffee during the breastfeeding period.

Based on research conducted by experts at Harvard University, caffeine consumption for nursing mothers is no more than 300 mg/day or as much as 3 cups of coffee/day. The results of research conducted at the Mayo Clinics Rochester Minnoseeta USA showed that if caffeine consumption exceeds 300 mg/day, the iron content in breast milk is 30% lower than breastfeeding mothers who do not drink caffeine. Therefore, for the health of mothers and babies, breastfeeding mothers should avoid drinking coffee.

Nutrition Intake for Smooth Milk Production in Breastfeeding Mothers

Breast milk production can be increased by giving early and routine breastfeeding, improving
breastfeeding techniques or consuming foods that affect milk production. Indonesian people have a tradition or habit of utilizing natural resources, both plants and animals, as ingredients for medicinal properties (Istiqomah et al., 2015).

1. Lactagogum

One effort to boost milk production is to eat foods that contain lactagogum. Lactagogum is a drug that can increase or facilitate the production of breast milk. Some of them are efficacious as lactagogums such as katuk, lampes, anise, thorn spinach, upas bidara, blustru, chicken dadap, bitter black cumin, moringa, jackfruit, patikan kebo, pulai, temulawak, turi, and young papaya fruit (Istiqomah et al., 2015).

Lactagogum can stimulate the hormones oxytocin and prolactin, such as alkaloids, polyphenols, steroids, flavonoids and other substances that are most effective in increasing and facilitating milk production. The hormonal prolactin reflex produces milk, when the baby suckles the mother's nipple, neurohormonal stimulation occurs on the mother's nipple and areola. This stimulus is transmitted by the vagus nerve to the pituitary gland and then to the frontal lobe. These lobes secrete the hormone prolactin, which enters the bloodstream and reaches the glands that produce milk. This gland is stimulated to produce milk (Istiqomah et al., 2015).

2. Mung beans

Mung bean (Phaseolus radiate), is a plant that can grow almost anywhere in Indonesia. Indonesian people have long known various types of processed mung bean foods, such as mung bean porridge, mung bean drinks, traditional cakes and bean sprouts. Traditionally, pregnant women in Indonesia are advised to drink mung beans so that their unborn child will have thick hair. 100 grams of green beans contain 124 mg of calcium and 326 mg of phosphorus which are useful for strengthening bones, as well as 19.7-24.2% protein and 5.9-7.8% iron to produce maximum breast milk (Istiqomah et al., 2015).

Mung bean extract is not a drug for nursing mothers, but it can help breastfeeding mothers recover. So if the mother's milk is not produced much, while the mother does not want to go to the midwife or doctor, the mother can use mung bean extract as an alternative to treating breast milk dams and milk that does not come out smoothly and in large quantities. Apart from the favorable price, mung bean extract can also be made yourself or you can buy packaged mung bean extract, which makes mothers who have difficulty breastfeeding because there is little milk, more interested and willing to try it (Wardana et al., 2018; Istiqomah et al., 2015).

3. Papaya leaf

There are easy ways to deal with breast milk that is not smooth enough, such as trying traditional ingredients. One plant that can increase milk production is papaya leaves. Papaya leaf extract has been used for a long time and through several studies it is very useful in increasing breast milk production. Papaya leaf is a plant that contains vitamins needed for the growth of the baby and the mother's health, so it can be a very possible source of nutrition. Rich in protein, fat, vitamins, calcium (Ca) and iron (Fe) in papaya fruit will increase the formation of hemoglobin in the blood, it is hoped that oxygen in the blood will increase, metabolism will also speed up, so that brain cells work efficiently. In addition, papaya leaves also contain the enzymes papain and potassium, the function of these enzymes is to break down the protein eaten, while potassium is useful for meeting potassium needs during breastfeeding. Because the body feels tired when it lacks potassium, and potassium deficiency also causes mood swings to depression, mothers
should think positively and be happy while breastfeeding (Hidayati and Kiki Megasari, 2022).

Papaya leaf is a plant that contains vitamin A 1850 SI; vitamin B1 0,15 mg; Vitamin C 10 mg, calories 79 calories; protein 8.0 grams; fat 2 grams; carbohydrates 11.9 grams; calcium 353 mg; phosphorus 63 mg; iron 0.8 mg; water 75.4 grams; carposid; papayatin; carp; carps; lactagogum; and vitamins necessary for the growth of the child and the health of the mother making it a very viable source of nutrition. The high content of protein, fat, vitamins, calcium (Ca) and iron (Fe) in papaya fruit increases the formation of hemoglobin in the blood, so that blood O2 increases, metabolism also speeds up, so brain cells work properly (Muhartono et al., 2018; Hidayati and Kiki Megasari, 2022).

The Relationship Between Nutritional Intake With Smooth Milk Production
The intake of nutritious food in breastfeeding mothers determines the quality of breast milk and how quickly the body returns to its original shape before pregnancy and childbirth. Nursing mothers need additional energy of 400 - 500 calories per day for good breast milk production and the total needs during breastfeeding increase to 2500 - 2700 kcal per day with an increase in carbohydrates of 65 grams per day, protein of 25 grams, 500 milligrams iron per day, 2500 IU of vitamin A, 0.4 milligrams of vitamin B1, and 30 milligrams of vitamin C. Nutrients will be taken from the mother’s body and must be replaced by the mother’s daily food intake (KEMENKES RI, 2022).

Basically nutrition is needed not only in the process of smooth milk production but also needed in the life cycle. Mothers with good nutritional intake will produce breast milk better and more smoothly than mothers with less nutritional intake. The formation of breast milk is influenced by the hormone prolactin. The hormone prolactin is the main hormone that controls and causes the release of breast milk. This hormone regulates the cells in the alveoli to produce breast milk. Expenditure of the hormone prolactin will be hampered if the mother is in a state of poor maternal nutrition. If the mother’s nutrition is good, it will stimulate prolactin secretion which will stimulate the adenohypophysis (anterior pituitary) so that prolactin comes out (Kusparlina, 2020; Amir et al., 2010).

Balanced nutrition during breastfeeding is a very important requirement for breastfeeding mothers. Nutrition in nursing mothers is closely related to the production of breast milk which is needed for the growth and development of the baby. Breastfeeding mothers are not too strict in regulating their nutrition, the most important thing is food that guarantees the formation of quality breast milk in sufficient quantities to meet the needs of their babies (Saputra, 2016).

CONCLUSION
According to the Indonesian Law Number 36 of 2009 Breast milk is a fat emulsion in a solution of protein, lactose and organic salts secreted by the mother’s mammary glands as the baby’s main food. Balanced nutrition for nursing mothers must meet the needs for himself and for the growth and development of the baby. Balanced nutrition can be fulfilled by providing a variety of diets, starting from fulfilling macronutrients and micronutrients, as well as consuming sufficient water and limiting consumption of foods and drinks that can affect the quality of breast milk. Providing breast milk can prevent stunting in infants, where babies who do not receive breast milk are at 38.89 times the risk of suffering from stunting.
REFERENCES


Ari Madiyanti, D. et al. (2020) Relationship Of Food Intake With Adequate Breast Milk In Breastfeeding Mothers At Health Center Rejosari. Available at: https://ejournal.umpri.ac.id/index.php/JIK%7C68.


Hardinsyah et al. (2013) 'Kecukupan Energi, Protein, Lemak Dan Karbohidrat'.

Hastuti, P. and Tri Wijayanti, I. (2017) 'Analisis Deskriptif Faktor yang Mempengaruhi Pengeluaran Asi pada Ibu Nifas di Desa Sumber Kecamatan Sumber Kabupaten Rembang'.


