

# Breastmilk

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## **Introduction**

Breastmilk is uniquely superior for infant feeding. It is the normal food for infants from birth.

Breastmilk contains all of the essential nutrients, antibodies and other factors important for growth and development. It cannot be replicated.

Providing breastmilk has many benefits to both the infant and mother. Mothers benefit from breastfeeding, both in the short term and for their long term health. Breastmilk is also very important for pre-term infants.

There is no financial cost for breastmilk and it's a convenient way to feed the infant.

Considerable research and investigation has been undertaken into the composition of breastmilk which underpins our understanding of the importance of this dynamic fluid.

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## **1 Are there different types of breastmilk?**

Yes. There are different types of breastmilk depending on the stage of lactation. Breastmilk is constantly changing, even throughout a single feed. An infant can have varying degrees of appetite and thirst, and so breastmilk can also vary to meet the infant's individual nutrition and fluid requirements. Breastmilk composition can vary depending on the time of day and also significantly between mothers. Due to this variability, the nutritional content of breast milk is typically provided as average values of nutrients in mature breastmilk.

## 2 What are the different stages of lactation?

### Colostrum

- Colostrum is the secretion produced during the first few days (1-7 days) after birth and differs from both transitional and mature milk. It contains a higher amount of protein, less fat and a number of immunising factors for the newborn.
- Transitional milk
  - It is the transition from colostrum to mature milk, where lactation is established and production of milk begins in the breast tissue. Transitional milk is produced from approximately day 8 – 20.
- Mature milk
  - Mature milk is produced from 20 days after birth, onwards. It can vary in and between individuals and the energy can vary between 270 and 315 kJ per 100mL. This is largely due to the variation in the fat content, as the fat of the milk received by the infant increases as the feed progresses. Mature milk continues to provide immune factors and other important non-nutritional components to the infant.

## 3 What are the nutrients in breastmilk?

Breastmilk contains all the nutrients the infant needs for proper growth and development.

These nutrients include:

Free water

Proteins – Protein accounts for 75% of the nitrogen-containing compounds and the non-protein nitrogen substances include urea, nucleotides, peptides, free amino acids and DNA.

Fats – Essential fatty acids and long-chain polyunsaturated fatty acids

Carbohydrates – The principal carbohydrate of human milk is lactose.

Minerals, vitamins, and trace elements.

Table: Composition of some of the key nutrients found in breastmilk

<b>Component</b>	<b>Mean value for mature breastmilk (per 100mL)</b>
Energy (kJ)	280
Energy (kcal)	67
Protein (g)	1.3
Fat (g)	4.2
Carbohydrate (g)	7.0
Sodium (mg)	15
Calcium (mg)	35
Phosphorus (mg)	15
Iron (mcg)	76
Vitamin A (mcg)	60
Vitamin C (mg)	3.8
Vitamin D (mcg)	0.01

Source: NHMRC Dietary Guidelines for Children and Adolescents in Australia, 2003

#### 4 What are the other components of breastmilk?

Breast milk also contains important non-nutritional components, such as antimicrobial factors, digestive enzymes, hormones and growth factors that are important for passive protection against infections and immune-mediated diseases and modulate immunological development.

Immune-related components and growth factors include:

Secretory IgA - Predominant immunoglobulin in breast milk

Bioactive cytokines - Including transforming growth factor- $\beta$  (TGF- $\beta$ ) 1 and 2 and interleukin-10 (IL-10)]

Others – leukocytes, oligosaccharides, lysozyme, lactoferrin, adiponectin, interferon- $\gamma$ , epidermal growth factor (EGF) and insulin-like growth factor (IGF)-1.

**5. How long should an infant be exclusively fed breastmilk?**

Breastmilk can be provided exclusively for around the first 6 months, meeting all of the Infants nutritional needs. Breastmilk is still very important beyond the first 6 months. Once complementary foods are introduced breastmilk continues to provide important nutrients and growth factors up to 2 years. In Australia and New Zealand, breastmilk is recommended during the infants first year of life and then continued if this suits mother and infant. The WHO recommends that breast milk continue to be part of a child's diet, to 2 years of age and beyond.

**6. How long should the infant continue to be fed breastmilk?**

Breastmilk is still very important beyond the first 6 months. Once solids are introduced breastmilk continues to provide important nutrients and growth factors up to 2 years. The WHO recommends breastmilk continue to be part of the young child's diet, to 2 years of age and beyond.

**References:**

American Academy of Pediatrics, Committee on Nutrition. *Pediatric Nutrition Handbook*. Kleinman RE, ed. 6<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009.

American Academy of Pediatrics, Policy Statement. Breastfeeding and the use of human milk. *Pediatrics* 2005; 115:496-506.

ESPGHAN Committee on Nutrition; Agostoni C, Braegger C, Decsi T, *et al*. Breast-feeding: A Commentary by the ESPGHAN Committee on Nutrition. *Journal of Pediatric Gastroenterology and Nutrition* 2009; 49:112-125.

Ministry of Health. 2008. Food and Nutrition Guidelines for Healthy Infants and Toddlers (Aged 0-2) A Background Paper (4<sup>th</sup> Ed). Wellington: Ministry of Health.

National Health and Medical Research Council (NHMRC). 2003. Dietary Guidelines for Children and Adolescents in Australia, incorporating the Infant Feeding Guidelines for Health Workers. Endorsed 10 April 2003.

Walker A. Breast milk as the gold standard for protective nutrients. *Journal of Pediatrics* 2010; 156(2):Suppl. 1.

World Health Organization. <http://www.who.int/topics/breastfeeding/en/>. Accessed 29<sup>th</sup> July 2010.