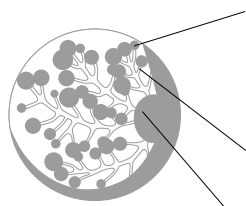


What makes breast milk so amazing?

Surprise! The breast is an organ, too!

Your breasts can also be called mammary glands and they produce breast milk. Within each mammary gland, different parts play a role in making and transporting breast milk.



1 Alveoli

This is where breast milk is made and stored. Alveoli are clusters of small grape-like sacs in your breast. They are surrounded by tiny muscles that squeeze them and push the milk out into the secondary milk ducts. Alveoli develop during your pregnancy.¹

2 Secondary milk ducts

This complex network of small tubes carries milk from the alveoli to the main milk ducts.¹

3 Main milk ducts

These are tubes that carry milk straight to your baby. You have an average of 9 of these main milk ducts in your nipple.¹

Breast milk is a living fluid

Breast milk is a living substance that changes to meet the growing needs and development of your child.



The power of colostrum

The precious colostrum and the milk you make in the first weeks are different from mature milk. Colostrum may not seem like a lot of volume, but it is jam-packed with ingredients and contains double the amount of protein than your later milk.² These proteins protect your baby against diseases from the very beginning.³ The earlier the infant is born (premature), the higher the concentration of these components.¹⁰⁻¹²

Wow! The cells can change!

Breast milk contains live cells, like stem cells. These stem cells can be directed to become other body cell types such as bone, fat, liver and brain cells and may act as a type of "internal repair system".⁴ Isn't that incredible?

Your breast milk is flavoured by what you eat

Breast milk has a flavour profile: Just as the foods you eat during pregnancy flavour the amniotic fluid, those you eat during breastfeeding flavour the milk. This may 'signal' later food preferences of your baby.⁵



Pregnancy



Breastfeeding



After weaning

Breast milk is the most natural defence

When your baby is born, breast milk is your baby's first immunization to help fight disease and illness.



Thousands of ingredients

There is no substitute for breast milk. There are thousands of different ingredients in breast milk such as proteins, fats, lactose, vitamins, iron, minerals, water and enzymes. The vast majority of these ingredients cannot be replicated artificially.³

Over 200 prebiotics

Breast milk contains prebiotics, more than 200 complex sugars (oligosaccharides) that help protect the gut from different types of microbes.⁶ No other species has so many special sugars except perhaps the elephant!⁷

When mothers give birth prematurely, their milk is rich in substances that help to make up for the babies' shorter time in the womb. Mother's milk helps the babies' body organs grow as they should and also gives them an extra boost of protection against infection and other complications.¹³⁻¹⁸

Just the fat your baby needs

Human milk is specifically designed for human babies. Your milk contains around 4% fat, while milk of seals and whales contains up to 50% fat! The fats in your milk are important for growth and development, and are even antibacterial.³

Over 1000 proteins

Many of the proteins in breast milk are active with functional roles! Some of these proteins can help to kill bacteria and others can identify pathogens. These immune proteins are guards that protect against microbes.^{3,8}

Breast milk supports brain development

The brain is the fattest organ in the body! Brain mass almost doubles in the first 6 months and at 2 years of age it reaches approximately 80% of adult size. Breast milk contains essential components for optimal development of the brain.⁹



Brain at birth
0.38 kg



Brain at 6 months
0.64 kg



Brain at 1 year
0.97 kg



Adult brain
1.45 kg

Breast milk: The ultimate all-in-one meal

Amazingly, your body produces the right nutrients in the right amount and the right volume of milk to match your baby's needs at all times.

References: 1 Hassiotou F et al. Clin Anat. 2013;26:29-48. 2 Molinari CE et al. J Proteome Res. 2012;11:1696-1714. 3 Jensen RG, editor. Handbook of milk composition. San Diego: Academic Press; 1995. 919 p. 4 Hassiotou F et al. Stem Cells. 2012;30:2164-2174. 5 Mennella JA et al. Pediatrics. 2001;107:E88. 6 Moukartzel S et al. Clin Perinatol. 2017;44:193-207. 7 Kunz C et al. Br J Nutr. 1999;82:391-399. 8 Beck KL et al. J Proteome Res. 2015;14:2143-2157. 9 Dekaban AS. Ann Neurol. 1978;4:345-356. 10 Meier, P.P. et al. Improving the Use of Human Milk During and After the NICU Stay. Clin Perinatol 37, 217-45 (2010). 11 Ballard, O. & Morrow, A.L. Human Milk Composition. Pediatr Clin North Am 60, 49-74 (2013). 12 Dvorak B et al. Concentrations of Epidermal Growth Factor and Transforming Growth Factor-Alpha in Preterm Milk. Adv Exp Med Biol. 2004;554:407-409. 13 Khodayar-Pardo P et al. Impact of lactation stage, gestational age and mode of delivery on breast milk microbiota. J Perinatol. 2014;34:599-605. 14 Ronayne de Ferrer PA et al. Lactoferrin Levels in Term and Preterm Milk. J Am Coll Nutr. 2000;19:370-373. 15 Dvorak B et al. Increased Epidermal Growth Factor Levels in Human Milk of Mothers with Extremely Premature Infants. Pediatr Res. 2003;54:15-19. 16 Treggott V et al. Sequential C3 and C4 Levels in Human Milk in Relation to Prematurity and Parity. Clin Chem Lab Med. 2000;38:609-613. 17 Ballabio C et al. Immunoglobulin-A Profile in Breast Milk from Mothers Delivering Full Term and Preterm Infants. Int J Immunopathol Pharmacol. 2007;20:119-128. 18 Pereira GR et al. Serum myoinositol concentrations in premature infants fed human milk, formula for infants, and parenteral nutrition. Am J Clin Nutr. 1990;51:589-593.



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