Breast milk and infant formula – for better or for worse

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Would you give a bottle of a mixture containing environmental toxins to your newborn baby? Imagine that there was a way to analyze and clean this mixture from toxins, wouldn't you prefer that? Throughout the 20th century environmental toxins have been widely used and as a result they have accumulated in our bodies. These compounds are found in the body where fat is abundant, such as in the breast milk of a mother, and is transferred via the milk to the child. On the other hand, breast milk contains specific compounds that play important roles in the development of the child, properties that infant formula lacks.

Breast milk and toxins

Recent years' research has shown that breast milk contains not only nutrients and unique components important for the development of the child, but also disturbingly high amounts of environmental toxins. Although some of the toxins are decreasing in concentration, others are not changing at all and some are even increasing. No analyses for toxins are made on breast milk in hospitals where breast milk from donors is given to preterm infants.

Environmental toxins in humans

During and after the Second World War large amounts of organic chemicals were distributed on the market. These chemicals were sold all over the world, and used in industry and as pesticides. Later it was revealed that these chemicals were poisons and killed animals that they were not supposed to kill. They are therefore referred to as environmental toxins. The toxins are found in the fat tissue of animals and in the human body, where they are slowly degraded. Among the observed effects of these toxins on laboratory animals is cancer and disturbed sexual development. Although the toxins are experimentally tested one by one, little is known about the effects of all of the toxins together, something commonly called "the cocktail effect".

Transmission of environmental toxins via breast milk
A woman who is breast feeding her baby will transfer toxins from the fat in her milk to the baby, where they will accumulate in the baby's fat tissue. A calculation based on the amount of toxins found in breast milk, the breast milk intake of an infant per day and the infant's weight, shows shocking results. When fed breast milk an infant will be exposed to certain toxins that widely exceeds the recommended daily intake (RDI) set by the WHO.

Decreasing the amount of environmental chemicals in donated breast milk
As mentioned a mother carries environmental chemicals in her fat tissue. Unfortunately there is little she can do to decrease the amount of toxins present there. Despite this, she should still breast feed her baby because the benefits derived from the unique contents in breast milk are not found elsewhere. A suggestion for the future is that when breast milk is donated at a hospital and given to preterm babies, the

breast milk should be “cleaned” from environmental toxins and foreign substances before fed to the baby.

Breast milk vs. Infant formula

Composition and use of infant formula

Infant formula is given to babies whose mothers are not able to or unwilling to breast feed. This could be because the mother has diseases that could infect the infant, or the infant is allergic to some of the components in breast milk, such as lactose or protein. Infant formula is based on cow’s milk, soy or animal protein and often comes as a freeze dried powder. Vitamins, trace elements and even plant sugars are also added to the infant formula, in an attempt to make it resemble breast milk. This gives the infant formula a higher nutritional value than breast milk. Babies who have been fed infant formula exclusively therefore are at a higher risk of developing obesity in later life than breast fed babies. Infant formula-fed babies also are at a higher risk of developing food allergies and asthma than breast fed babies. The fact that infant formula lacks components that are important for the development of the gastrointestinal tract, such as proteins killing bacteria, increases the risk of these babies getting diarrheas, which could be a life threatening condition. Infant formula has limited use in areas of the world where there is lack of clean water.

Infant formula restrictions

The World Health Organization (WHO) recommends women to breast feed their babies for at least six months, without any other complementary food. To make sure that the companies that produce infant formula do not influence women in such a manner that they choose their product instead of breast feeding, the WHO has set up rules for the marketing and use of infant formula. This is called the International Code of Marketing of Breast-Milk Substitutes, also referred to as The WHO-Code. This prevents the companies that produce infant formula from advertising their products in any country.

Breast milk

Human breast milk contains all the nutrients the baby needs during its first months of life. Breast milk consists of a unique mixture of macro- and micronutrients that change during the period of breast feeding, according to the needs of the baby. The amount of milk produced is determined by how much and how often the baby nurses. A breast can produce up to 1.5 liters of milk every day. Breast feeding can continue as long as the milk is removed from the breast, which means that women are able to feed their babies as long as they wish.

Breast milk composition

Breast milk is composed of water, sugar, protein, fat, minerals and immune cells. The volumes of these components vary depending on the stage of lactation, so that the milk is rich in protein and low in fat the first few days and the amount of protein decreases and the amount of fat increases over time.

Special components

Sugar
The sugars combine into oligosaccharides with complex structures, which resist degradation in the gastrointestinal tract. The oligosaccharides therefore are present in large amounts in the small intestine. This has been found to be important for the development of the child's microflora in the gastrointestinal tract. The oligosaccharides prevent unwanted bacteria from binding to the surface of the intestine by binding to the bacteria themselves. In this way some bacteria have a limited possibility of attaching to the intestine. Thus, they will leave the body with the child's feces as a bacteria-oligosaccharide complex. It has been shown that bacteria known for causing diarrhea among new born babies, a life-threatening condition, often are limited in this way by oligosaccharides in breast milk.

Protein
Some of the proteins in breast milk also resist degradation in the gastrointestinal tract, performing a number of functions. The protein lactoferrin binds iron atoms in the breast of the women and inside the baby's gut so that bacteria that need iron for growth have difficulties surviving there. Yet other proteins help with the degradation of fat and sugars. Also to mention is the protein named HAMLET (human α-lactalbumin made lethal to tumor cells) that can cause cell death in tumor cells but spares healthy ones.

More information

http://www.amningshjalpen.se/

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