

# **Cow colostrum can be used to supplement mother's own milk in premature infants, studies show**

July 14 2023

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Every year, 15 million infants are born prematurely. One million of them end up dying. In the early life of these small infants, proper nutrition is

crucial. It is essential for the infants' survival and for the development of organs, including the brain.

The best nutrition option for a prematurely born infant is breast [milk](#). It boosts the [immune system](#) and provides the infant with all the necessary nutrients. However, in many cases the mother of a preterm infant is not be able to produce milk just after birth. Later, the composition of mother's milk is also inadequate to secure optimal growth.

Therefore, supplements are needed. Currently, infant formula products are used, but they may cause serious intestinal problems for the premature infant.

Now, there may be a new alternative on the table. Researchers from University of Copenhagen and 16 hospitals in Denmark and China have found that prematurely born infants can be supplemented with cow colostrum instead of baby formula products. Studies on 350 infants in China show that cows colostrum can reduce the use of infant formula just after birth, while studies on 232 Danish infants show that it can strengthen mother's milk later.

"Based on the two studies, we conclude that cow colostrum is a promising new milk supplement for prematurely born infants, but caution is necessary. In the hospitals, infants receiving cow colostrum had similar health outcomes as infants not receiving the supplement," says Professor Per Torp Sangild from the Department of Veterinary and Animal Sciences.

Elevated levels of [amino acids](#) were found in blood of the newborn infants that received cow colostrum. Amino acids are the basic building blocks of proteins, which the newborn needs to develop tissues such as muscles and organs. They are necessary, but too high levels can be toxic to the body.

"The studies suggests that cow colostrum is most beneficial in the first few weeks after birth of the prematurely born baby. How we can optimize the cow colostrum product for prematurely born infants at this critical time is something we investigate further," says Per Torp Sangild

## **Colostrum can boost the immune system and protect against bacteria**

Within few days, prematurely born infants go from having zero to billions of bacteria in their intestines. This is dangerous if they do not simultaneously develop their immune system to protect them from bacteria.

This is where the first milk, colostrum, is a great help. Research suggests that colostrum is packed with substances that help to recognize and fight bacteria and viruses.

"Colostrum contains antibodies, such as immunoglobulins, which help present bacteria to the immune cells so that they can recognize them. So, factors in colostrum can be essential for fighting infections," says Per Torp Sangild.

Prematurely born infants are born with lower levels of immunoglobulins in their blood because they are born before all immunoglobulin has been transferred from the mother in the third trimester of pregnancy. At this time, the protective layers in the intestines are also not fully developed.

"The theory is that factors in the colostrum manage to control the bacterial population so that the intestines are protected from developing inflammation. This applies not only to colostrum coming from the mother but also to colostrum coming from cows that contains many components similar to human colostrum," explains Per Torp Sangild.

## Five years and over 50 studies on prematurely born pigs

Per Torp Sangild and his colleagues have worked on the two new studies for five years. And even before they could begin studying prematurely born infants, they conducted over 50 studies on prematurely born pigs in the last 20 years.

"Prematurely born piglets are very dependent on receiving the right amount and type of milk, therefore we can use these animals to indicate how best to use cow colostrum for infants," says Per Torp Sangild.

The next step for the researchers is to investigate how they can modify the protein content of colostrum from [dairy cows](#) to make it even better for helping development of prematurely born infants.

"We dream of developing different colostrum products that can be used safely and protect both premature infants and other patients against serious infections and gut diseases," Peter Torp Sangild concludes.

The studies, "Bovine colostrum to supplement the first feeding of very preterm infants: The PreColos randomized controlled trial" and "Bovine colostrum as a fortifier to human milk in very preterm infants—A [randomized controlled trial](#) (FortiColos)," appear in the journal *Clinical Nutrition*.

## This is what the researchers did

In both Denmark and China, the prematurely born infants in the studies received as much [breast milk](#) from their mothers as possible, in addition to donor milk from other mothers (Denmark) or infant formula (China). The milk diets were given with or without extra cow colostrum through a

feeding tube.

In both Denmark and China, parents of prematurely born infants were asked to participate in the study within a few days after birth. The infants had their blood and feces sampled before and after starting to supplement mother's milk with cow colostrum. These samples were subsequently analyzed by the researchers.

The colostrum from dairy cows came from cows within the first day after giving birth to a calf that were first given what it needed of cow colostrum. Cow [colostrum](#) collected from many cows and farms was sterilized and made into a dry powder before used for the [infants](#).

**More information:** Xudong Yan et al, Bovine colostrum to supplement the first feeding of very preterm infants: The PreColos randomized controlled trial, *Clinical Nutrition* (2023). [DOI: 10.1016/j.clnu.2023.06.024](#)

Agnethe May Ahnfeldt et al, Bovine colostrum as a fortifier to human milk in very preterm infants—A randomized controlled trial (FortiColos), *Clinical Nutrition* (2023). [DOI: 10.1016/j.clnu.2023.03.008](#)

Provided by University of Copenhagen

Citation: Cow colostrum can be used to supplement mother's own milk in premature infants, studies show (2023, July 14) retrieved 12 May 2024 from <https://medicalxpress.com/news/2023-07-cow-colostrum-supplement-mother-premature.html>

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