

Genetically modified cows may one day produce human breast milk

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(PhysOrg.com) -- Researchers in China led by Ning Li, the director of the State Key Laboratories for AgroBiotechnology at the China Agricultural University, have created cow milk similar to human breast milk which could one day replace the need for baby formula.

Currently [cow milk](#) is not readily digested and absorbed by human [infants](#), so for those mothers who choose not to breastfeed or who are unable, the only current alternative is formula. Many argue that infant formula is inadequate in providing the full nutrients an infant needs. [Human milk](#) contains numerous proteins as well as human lysozyme (HLZ), which is a key in fighting [bacteria](#) and boosting an infant's immune system.

With this in mind, Li and his team introduced human lysozyme and other

human proteins into the embryos of Holstein cattle and then placed these embryos into surrogate cows. In this recent study, printed in *Public Library of Science One*, the researchers state that it was cloning technology used to introduce the human genes into the cows DNA. When these genetically modified cows started lactating, the milk they produced contained HLZ as well as other human proteins such as lactoferrin and lactalbumin which also help to boost an infant's immune system.

A purification process was then used to increase the fat content and milk solids, as well as make the milk taste closer to that of human breast milk. It is the researcher's hope that one day we will be able to purchase this genetically modified cow's milk in grocery stores.

Protestors against the cloning and genetic modification of animals worry about the animal welfare, as well as the possible danger of exposing infants to this genetically modified milk. In one of the experiments in this study, of the 42 calves born, ten died not long after birth and the other six died within months. Health problems are not uncommon in genetically altered animals and they suggest this be taken into consideration before suggesting infants consume this milk.

More information: Yang B, Wang J, Tang B, Liu Y, Guo C, et al. (2011) Characterization of Bioactive Recombinant Human Lysozyme Expressed in Milk of Cloned Transgenic Cattle. *PLoS ONE* 6(3): e17593. [doi:10.1371/journal.pone.0017593](https://doi.org/10.1371/journal.pone.0017593)

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