Infant formula blocks HIV transmission via breastfeeding

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Acquired Immune Deficiency Syndrome (AIDS) is a global epidemic threatening the lives of millions of people. Because there is no known cure, prevention of the transmission of the virus that causes AIDS, the Human Immunodeficiency Virus (HIV), is critical for controlling the disease.

The transmitting routes of HIV include breastfeeding, which passes the virus from mothers to infants. This is a major problem in many areas of Africa, where HIV-positive mothers have no alternative to breastfeeding. So far, no practical and effective methods are available to prevent HIV transmission by this route.

A team of researchers from Lavax (Palatine, Ill.) and the University of Illinois at Chicago, reporting today during the 86th General Session of the International Association for Dental Research (IADR), is developing a new technology that prevents the infection of HIV by breastfeeding. They have isolated a special strain of probiotic lactobacilli from the human mouth. It belongs to the same species as those found in dairy foods, such as yogurt and kefir.

This strain captures the HIV virus by binding to its outer 'envelope'. Because it grows and reproduces itself in milk, once an infant is inoculated with the Lactobacillus, the protection may last until the infant is weaned. This technology offers an easily administered alternative to HIV vaccines, which are currently unavailable. However, the hot climate and the lack of refrigeration in Africa pose a great challenge for the

shelf life of lactobacilli. The aim of this study was to develop a lasting formula of lactobacilli for infants to be used as prevention against the transmission of HIV through breastfeeding.

Currently, the best bio-protecting agents for lactobacilli are sucrose and trehalose. These sugars preserve freeze-dried lactobacilli well at 4°C and 20°C. However, at a warmer temperature (33°C), after 4 weeks of storage, all Lactobacillus cells protected with sucrose or trehalose die. By screening a variety of food ingredients for a better protective agent, the investigators have identified a new alternative. This new agent kept the HIV-capturing Lactobacillus strain viable for more than 12 weeks at 33°C. Their analysis showed that, after 12 weeks, the Lactobacillus in the infant formula was as good as fresh Lactobacillus in capturing HIV and blocking the HIV infection of cultured mammalian cells.

In summary, scientists have developed a new preservation method that can maintain HIV-capturing lactobacilli in a hot climate without refrigeration. This method will facilitate the development of a safe and effective prophylactic formula to protect infants from HIV in mother's milk.

Source: International & American Association for Dental Research