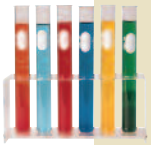

The Milken Institute ranked New Hampshire ninth among the 50 states on its Science and Technology Index, for having assets that are likely to foster high-quality economic growth.

Is breast best even with HIV-infected moms?

"Breast is best" is no news flash. It's now common knowledge that breast-feeding provides superior nourishment for babies and helps them build strong immune systems. Breast-feeding does, however, allow the human immunodeficiency virus (HIV) to pass from an infected mother to her child. In the U.S. and Europe, HIV-infected mothers can avoid that risk by feeding their babies formula.

But in developing countries, formula may be unaffordable or unsafe. "Mothers either have no access to formula," explains DMS researcher Ruth Connor, Ph.D, "or if they do have access it's often a problem of getting clean water or a heat source to sterilize the formula."

"It's amazing how little is understood" about HIV and breast milk.

Fed: But surprisingly, the risk of a baby contracting HIV from its mother is not proportional to the amount of breast milk the baby receives. Several studies have found that babies who are mixed-fed—that is, who receive formula or other foods in addition to breast milk—are much more likely to contract HIV than those who are exclusively breast-fed.

"But the question is why? What is the mechanism behind this?" wonders DMS postdoctoral fellow Stephanie Dorosko, D.V.M., Ph.D. Scientists have speculated that other foods may cause a mild inflammation in the intestine and make it more permeable, so it's easier for the virus to enter the baby's bloodstream. Dorosko and Connor set out to determine if that's actually the case. Their hope is that a better understanding of the mechanism will lead to better advice for HIV-positive mothers in developing countries.

They decided to examine calprotectin, a marker of inflammation in the gut that's used to screen for diseases such as irritable bowel syndrome and colon cancer. Calprotectin can easily be measured in feces and is stable at room temperature. The latter property is important, since they plan to eventually bring their study to African communities where refrigeration may not be readily available. But first, they decided to measure calprotectin in healthy infants—comparing levels in breast-only babies to those in mixed-fed babies.

Fecal: To do so, they teamed up with Suzanne Greeley, R.N., who facilitates a DHMC support group for new mothers. The moms filled out a questionnaire about their infants' feeding habits and saved the babies' diapers so their fecal calprotectin could be measured.

The results, published in the journal *Breastfeeding Medicine*, were unexpected. The researchers had assumed they'd see more inflammation in the mixed-fed babies, but calprotectin levels were higher in the breast-only babies. Dorosko suspects calprotectin may actually be protective in young infants. Connor wonders if infants in Africa will have higher calprotectin levels because they're exposed to more contaminants in their food.

"It's amazing how little is understood about how HIV is transmitted in breast milk," says Connor. But she and Dorosko plan to continue to chip away at that information deficit. KRISTEN GARNER

SLAWOMIR JASTRZEBSKI

A mother's HIV status is a factor in breast-feeding.

Watch and learn

If you want something done right, goes the conventional wisdom, do it yourself. But according to Dartmouth research led by Emily Cross, Ph.D., if you just want to *learn* how to do something right, you can sit back and watch someone else do it. "The ability to improve by observation alone, without concurrent practice," she wrote in *Cerebral Cortex*, "is a powerful capacity of humans." Cross measured the brain activity of participants as they tried to learn dance sequences and found that studying the sequences passively activated the same neural regions as did actively practicing them.

Got calcium?

"Several national organizations recommend a high calcium intake to achieve optimum bone health," wrote members of the DMS Departments of Medicine and of Community and Family Medicine in a recent article. But some research has called that recommendation into question. To help settle the dispute, the DMS team conducted a long-term study on the effects of calcium supplementation. In a recent issue of the *American Journal of Clinical Nutrition*, the researchers wrote that taking a daily supplement reduced the risk of bone fracture by 72%—but that the benefits disappeared once participants stopped taking the supplements.