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Soy isoflavone may inhibit common gastrointestinal illness in infants

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The soy isoflavone genistin--at concentrations present in soy infant formula-- may reduce a baby's susceptibility to rotavirus infections by as much as 74 percent, according to a University of Illinois study published in September's *Journal of Nutrition*.

"Rotavirus is the primary cause of diarrhea in infants, affecting virtually all children before age five. In the United States, it mainly leads to dehydration, doctor's visits, and parents missing work to care for sick children. In developing countries, though, rotavirus causes approximately 611,000 deaths each year," said Sharon Donovan, the Melissa M. Noel Professor of Nutrition at the U of I.

Although rotavirus vaccines have recently become available, they are expensive and cannot be given to some infants, she said.

"It's exciting to think that the isoflavones in soy formula could be a cost-effective nutritional approach to decreasing the incidence and severity of rotavirus infections, especially among children in developing countries who are most at risk," said the scientist of her work with doctoral candidate Aline Andres, who conducted the experiments.

In the study, cells in culture were exposed to rotavirus in the absence or presence of soy isoflavones, biologically active compounds in soy that are thought to have health benefits. Soy contains a number of different forms of isoflavones, and all were tested individually and as the complete mixture present in infant formula.

“Genistin and the mixture significantly reduced rotavirus infectivity by 33 to 74 percent,” she said. “But when genistin was taken out of the mixture, anti-rotavirus activity was lost, suggesting that it is the active component in reducing infectivity.”

Donovan focused her investigation on the isoflavone concentrations present in soy formula. That was the concentration at which rotavirus inhibition began to occur and then leveled off, indicating that there’s an effective range, and beyond that, there is no additional inhibition or toxicity.

“We then exposed the cells to different concentrations of rotavirus. If an infant had a severe infection or was exposed to a lot of rotavirus, we wondered if the isoflavones would still be as effective,” she said.

The inhibition held up across a 16-fold range of rotavirus exposure. “Even at the highest concentration of rotavirus particles, genistin or the mix of isoflavones inhibited infectivity,” said Donovan.

Genistin appeared to diminish infectivity by inhibiting binding of the virus to tissue-culture cells, she said.

Donovan’s laboratory soon plans to begin studies with neonatal piglets, an excellent model for studying rotavirus infection and the nutritional effects of various components on the intestine.

“We’ll be interested to see if we have the same results when we work with young animals,” she said.

Source: University of Illinois at Urbana-Champaign