

Model developed for manipulating vitamin D levels in calves

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A new model for manipulating vitamin D levels in young calves has been developed by Agricultural Research Service (ARS) scientists who say it could help establish just how much of this important nutrient the young animals need to promote optimal growth and health.

Newborn dairy calves get crucial vitamin D in the colostrum from their mothers as they nurse during the first few days after birth. Later, the neonatal calf often receives vitamin D in commercial milk replacers. But levels of vitamin D in these supplements may need to be reevaluated, given recent evidence suggesting vitamin D status influences not only [bone growth](#), but also [immune function](#).

ARS microbiologist Brian Nonnecke and others at the ARS National Animal Disease Center in Ames, Iowa, are examining the effects of vitamin D on the calf's immune system—especially relevant given the animal's susceptibility to infectious respiratory and intestinal diseases during its first weeks of life.

Nonnecke and his colleagues Tim Reinhardt and Ray Waters used the neonatal dairy calf as a model for evaluating the vitamin D status of calves. In the study, vitamin D status was controlled by vitamin D injections given to calves fed a vitamin-D-free milk replacer. They injected half the calves with 8,600 international units (IU) of vitamin D, and the rest with 54,000 IU of the vitamin. Using this approach, they found that vitamin D levels in the [bloodstream](#) of the young calf could be controlled in a predictable fashion.

The researchers also found that this model could be adapted to examine effects of subclinical [vitamin D deficiency](#) on the immune system of the calf. This is important, given that 8 to 10 percent of neonatal dairy calves in the United States die during the first months of life, and more than 30 percent are diagnosed with some form of clinical disease.

New studies using this model might provide support for revision of the National Research Council's current vitamin D recommendation for calves. It has the potential to allow researchers to take the next step toward determining the effects of vitamin D on the calf's immune system.

A paper on this research has been published in the *Journal of Dairy Science*.

Provided by United States Department of Agriculture

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