Vitamin A Matters: Supporting Reproduction, Growth, and Immunity in Cattle

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Vitamin A deficiency in cattle can manifest through a range of clinical signs, including reduced feed intake, growth issues, night blindness, and reproductive failures like low conception rates and stillborn calves. Calves born to vitamin A-deficient cows can exhibit signs of a depressed immune system, making them more vulnerable to disease. Recent concerns about the rising incidence of stillborn and weak calves across the United States have led some nutritionists to emphasize the critical importance of vitamin A supplementation in beef cattle production.

All animals require a dietary source of vitamin A. Vitamin A is typically provided to animals in plant products through its precursor, carotene. Cattle convert beta carotene from green vegetation into vitamin A. In a normal pasture season, the daily intake of carotene that is converted into vitamin A is three to five times the requirement. Cattle can store up to four months of vitamin A in the liver during this period. Under ideal conditions cattle fed good quality hay during the winter will maintain adequate vitamin A status.

Green, lush pastures are an excellent source of vitamin A, primarily due to their high beta-carotene content, the pigment found in these plants. During winter months or periods of drought, vitamin A deficiencies can arise because dormant plants contain significantly less beta-carotene compared to fresh forages. Cows grazing on dry, brown grass or consuming hay made from drought-stressed forages are likely to have low vitamin A. Even hay from good green forage may not maintain adequate vitamin A levels over time, as carotene is unstable and can degrade, even when stored properly. This degradation can result in a loss of one-third to one-half of beta-carotene levels each year. Therefore, it's crucial to keep mineral supplementation sources fresh to ensure adequate vitamin A intake, as feed grains and concentrates typically have low beta-carotene content.

Luckily, adding vitamin A to cattle diets is both simple and budget-friendly. It's best to provide this supplement in winter since summer pastures offer plenty of green grass. By the end of summer, cattle typically store ample vitamin A in their livers, but without supplementation during winter, deficiencies can develop. If dietary vitamin A is not adequate, a good time for injection in pregnant cows is at least two months prior to calving to build up stores in the cow and ensure that adequate amounts of vitamins are present in the colostrum. For cows deficient in vitamin A, a single injection may not be enough. These cows have a diminished capacity to store vitamin A in their liver, which means they might require more injections until their vitamin A reserves are sufficient or until adequate oral supplementation can be established. Calves have minimal vitamin reserves at birth and are highly dependent on an adequate supply of vitamins from the dam through colostrum and milk.

Thank you to Emma Briggs, Extension Beef Specialist, for the content of this article. If you have further questions regarding Vitamin A as we are approaching the winter, please feel free to reach out to Hunter Nickell, Livestock Production Agent at any Southwind Extension District office, or by email at nickell99@ksu.edu.