

Alfalfa fed in prepartum dairy diets

Hay & Forage Grower is featuring results of research projects funded through the Alfalfa Checkoff, officially named the U.S. Alfalfa Farmer Research Initiative, administered by National Alfalfa & Forage Alliance (NAFA). The checkoff program facilitates farmer-funded research.

ALFAFA hay can be used in rations for pregnant and non-lactating dairy cows without necessarily causing metabolic diseases such as clinical hypocalcemia — also called milk fever. That’s the conclusion of recent research by Virginia Tech’s Gonzalo Ferreira.

The dairy management extension specialist used Alfalfa Checkoff funding



GONZALO FERREIRA

Funding: \$91,721

to compare grass hay and alfalfa hay diets fed to prepartum cows with either calcium chloride or polyhalite mineral, which are acidogenic products that can prevent hypocalcemia.

“Typically, nutritionists avoid feeding alfalfa to prepartum dairy cows,” explained Ferreira. That’s because alfalfa, high in protein and energy, also contains high concentrations of potassium. Potassium can wreak havoc on a prepartum diet that is supposed to maintain a negative dietary cation-anion differ-

ence (DCAD), which improves calcium mobilization and reduces the risk of hypocalcemia in fresh cows.

But previous research Ferreira had completed on prepartum cows successfully consuming polyhalite salts as an acidogenic product got him thinking: “What if we can feed a large amount of these acidogenic products with alfalfa to be able to feed alfalfa without any (health) issues?”

He and Ahmerah Thompson, a Virginia Tech graduate student at the time, tested that theory by feeding 79 pregnant cows four diets using calcium chloride and polyhalite, each with grass and with alfalfa.

The grass hay contained 7.5% crude protein (CP), 74.9% neutral detergent fiber (NDF), 0.36% calcium, 0.09% sodium, 1.88% potassium, 0.38% chloride, and 0.15% sulfur. The alfalfa contained 19.6% CP, 45.6% NDF, 1.52% calcium, 0.16% sodium, 2.5% potassium, 0.77% chloride, and 0.32% sulfur. The grass hay had a DCAD equal to 289 mEq/kg dry matter (DM); the alfalfa hay’s DCAD was equal to 292 mEq/kg DM.

“We were expecting much more potas-

sium in the alfalfa and less potassium in the grass hays. We were expecting to see a big difference in the amount of negative DCAD in alfalfa versus grass — with higher DCAD in alfalfa and lower in grass,” Ferreira said. But that didn’t happen.

Test the alfalfa

One important take-home message from this study was that not all alfalfa hays are the same in nutrient content, and the same is true for grasses. Nutritionists and farmers should have hay analyzed for the minerals it contains before it’s fed. They may be able to feed forages like alfalfa that they have avoided in the past, Ferreira pointed out.

The study looked at DM intake, urine pH, calcium concentration in the blood and urine, and the amount of hypocalcemia shown by cows consuming the diets. More DM was consumed by cows eating grass hay than alfalfa. Dry matter intake didn’t differ between acidogenic products, and no interaction existed between hay type and acidogenic products.

Urine pH declined in each of the four

PROJECT RESULTS

1. Dry matter intake was highest for grass hay diets. DM intake didn’t differ between acidogenic products; no interaction was seen between hay type and acidogenic products.

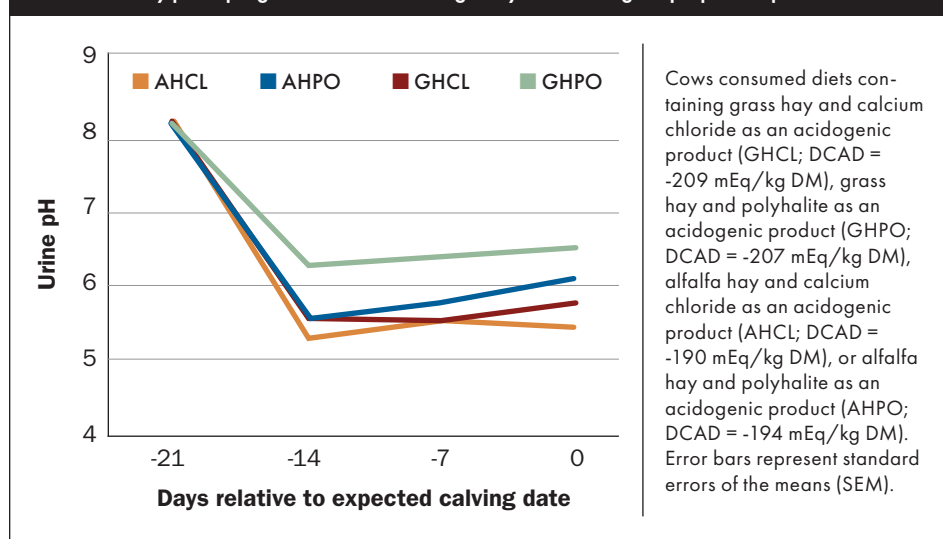
2. Urine pH decreased in all four diets, with all showing negative DCADs, but less so for cows on the grass hay diet.

3. The amount of calcium in plasma declined substantially around calving, but hay types and acidogenic products didn’t affect levels.

4. Calcium output in urine increased in cows on grass hay calcium chloride.

5. Only one cow had acute signs of hypocalcemia; 13 others showed levels of calcium in the blood within the hypocalcemia range without showing signs of the disorder.

Urinary pH of pregnant and nonlactating dairy cows during the prepartum period



diets, all of which showed negative DCADs, but less so for cows on the grass hay diet. The concentration of calcium in plasma dropped substantially around calving, but hay types and acidogenic products didn't have an effect. Calcium output in urine was elevated the most in cows on the grass hay calcium chloride diet.

Only one cow had acute signs of clinical hypocalcemia, which typically occurs when calcium concentration in the blood drops below 5.5 mg/dL, Ferreira said. "But several cows had low calcium concentrations at the clinical level (below 5.5 mg/dL) and did not show it as hypocalcemia. That is something intriguing to investigate

further," he added.

In his research report, Ferreira wrote that more study is needed evaluating fertility of the soil and the use of acidifying fertilizers "to better understand how to incorporate alfalfa hay in prepartum diets for pregnant and nonlactating dairy cows in the prepartum period." ●



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