Range cow weight loss linked to seasonal diabetes

NEW MEXICO STATE UNIVERSITY

LAS CRUCES — An estimated 16 million Americans have type 2 diabetes, and about 6 million of them don't even know it. Now, New Mexico State University scientists have unexpectedly found that range cows can become seasonally diabetic too.

Instead of putting themselves at risk with unhealthy diets and little exercise, these cattle develop symptoms during the early spring when there's little to eat but cracking dry, dormant grasses.

As the summer range greens up, the seasonal effect fades along with the cow's diabetes symptoms, which include weight loss and delays in conceiving calves. To head off this pricey tendency, NMSU researchers have developed and patented a new feed supplement, packed with protein and a beneficial bacterial enzyme called calcium propionate.

“Calcium propionate is already widely used in the dairy industry to treat ketosis, a condition that causes the cows to burn a large amount of fat in response to milk production after calving. Calcium propionate is also used in feed for beef cattle, since it slows mold growth,” said Richard Waterman, a NMSU research professor.

“We now know that calcium propionate enhances energy metabolism,” said Mark Peterson, a range animal nutritionist with NMSU’s animal science department. “It makes cows more efficient when grazing dormant winter forage.”

The new supplement should allow affected cows, primarily 2- to 3-year-olds, to start the reproductive cycle sooner, get pregnant on time and avoid having to leave the herd because they can't conceive, he said.

In regard to our environment, we expect a lot of these cows here in New Mexico,” Peterson said. “They have met our production goal, which ideally is having a calf every year on the same day each year.”

Ranches with only a short period between a cow ready to be rebred, said Waterman, now have a way to help them begin reproductive cycling in 60 days to get them pregnant on time, he said. By offering the supplement now, he said, “We were able to reduce that 60-day interval by about nine days.”

One drawback with the calcium propionate fortified supplement is the added cost of $10 per cow. NMSU researchers are studying ways to reduce the expense, looking at different levels of calcium propionate to determine whether it’s necessary to increase the amount to get a substantial benefit or whether a smaller amount will suffice.

Young cows often have difficulties in the spring because they're grazing dormant vegetation, while under stress of calving and lactation. During most of the grazing year they're eating dry, brown feed that's low in protein and nutrients, he said.

As the drop-off in feed quality occurs, diabetic characteristics appear, said Rachel Enders, another NMSU graduate student working on the project just as in humans, type 2 diabetes blocks ability to use insulin, or in farm animals, to use energy metabolism. The calcium propionate supplement increases glucose uptake as metabolism.

“As the glucose supply increases, the cows are able to gain weight sooner,” Enders said. “If they gain weight faster they’ll breed back sooner.”

Portions of the research were funded by the New Mexico Agricultural Experiment Station and grants from the U.S. Egg and Poultry Association in Georgia and Iowa-based Renal Industries, a food, pet food and livestock feed manufacturer.

NMSU's supplement study using calcium propionate began in 1988, and was conducted in the university's 27,000-acre Cima Range and Livestock Research Center. The worker ranch laboratory is located just outside the village of Campamento.

“Many other universities have their research in this metabolizable energy buildings. We do it in this field,” Peterson said. “These cows are in a situation that is as normal as possible for a grazing range animal in a research setting.”

This gives us quality data, we can do a lot of it in our time. And when we get done we can directly apply our results to those people out there trying to make a living.”