

Protein supplementation can modify grazing behavior, especially on fall and winter pastures.



Adequate Supplements for Winter Grazing

Protein supplements can extend fall, winter grazing.

by **HEATHER SMITH THOMAS**

This time of year in most regions of the country, forages are very low in protein, yet many ranchers try to extend grazing as long as possible through winter because winter feeding is the most expensive part of raising cattle. Adding a little protein supplement to fall and winter pastures, at a time when they should be feeding hay.

Adequate protein level in a ruminant diet is crucial for optimal microbial growth and function. Rumen microbes are key to unlocking the complex carbohydrates that are present in dried standing forage. Cattle can lose body condition on dry fall pastures, at a time when they should be building reserves in preparation for winter and next spring's calving. Without protein supplementation, the rumen cannot adequately digest the poor-quality forages. Protein supplements, whether supplied in cake, blocks or tubs, help improve digestion of low-quality forages and build body condition.

Cattle manure can give a clue about the protein level in your herd's feed. On

a high-protein diet, digestion is swift and feed moves through the tract quickly, resulting in loose feces. Without enough protein to feed the rumen microbes, digestion is slow. Feed moves through the tract slowly and results in firmer, drier feces. In some instances, cattle may become constipated or impacted. They don't eat enough and lose weight; the slow rate of digestion leaves the rumen relatively full, with not much room for additional feed.

On some winter ranges stockmen have blamed weight loss and impactions on lack of water when the real culprit was inadequate protein. Protein supplementation can remedy this problem.

Increase use of certain pastures

Protein can be used to encourage cattle to go to or stay in certain areas of a pasture, says David Bohnert, beef extension specialist and ruminant nutritionist at Oregon State University's (OSU's) Eastern Oregon Agricultural Research Center, Burns. "This is an aspect of feeding supplement [that] we generally

don't think about — utilizing it as a means of modifying grazing behavior and distribution," he explains.

Like strategic placement and location of salt and water developments, protein supplement can be placed in certain areas of a winter pasture to encourage cattle to graze those areas — such as areas that have more grass, or areas they might not use otherwise.

This might mean you can keep cattle grazing longer before they must be fed hay, or it might mean you could put more cattle out.

"We normally provide supplemental protein to meet an expected performance, but we also can use it to modify grazing distribution," Bohnert says. This is especially important in the West, where there are extensive pastures/rangeland, and the rancher's bottom line depends on how well these lands can be utilized without having to feed hay.

"In the Midwest and East, the farms and cow herds are generally not as large, and this might not be such an important factor. But here in the arid West, it takes a lot more acres per cow, with more

diverse environment and terrain. On average it might take 100 acres per cow (on a year-round basis to maintain that cow), whereas back East it might be only 10-20 acres per cow. So when we look at supplementation and putting out protein for those cows on pastures that might be 10,000 to 100,000 acres, supplementation becomes an opportunity and a challenge," says Bohnert.

You don't want to bring cattle home from that pasture because that's where they need to be grazing, but the logistics of taking supplement to those cows can be daunting.

"From an economic standpoint, if you are just looking at meeting their requirements, maybe blocks and tubs don't make sense, but perhaps that's not the whole picture," he says. "Those blocks/tubs might not provide everything they need to meet 100% of their requirements, but the cattle are getting a little more protein by using those, and you are able to modify grazing distribution."

Several decades ago a research project at Havre, Mont., used protein blocks to

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modify grazing distribution, checking cows' location with GPS collars. The research spurred additional studies at OSU's Union station.

"There's been a lot of work demonstrating that protein blocks/tubs can be used to modify grazing distribution, and thus improve pasture utilization. Additional research has shown that placing supplements in uplands, away from riparian areas, can decrease riparian utilization by cattle," Bohnert points out.

When forage gets dry and cattle want to spend more time in riparian areas because the forages are greener with more protein content, producers can use protein blocks or tubs to pull the cattle back to the uplands.

Bohnert notes, "Studies have shown

that you can decrease their grazing time in the riparian areas by 20% to 50% just by putting protein blocks in the uplands." When they have adequate protein they can utilize the dry grass.

On large range pastures the research team often used a protein supplement to pull cattle into desired areas, or areas where the cattle don't traditionally go, says Bohnert. Looking at some of the big pastures/rangelands, studies with GPS collars in Oregon have shown that usually the cattle only graze 40%-60% of the area, depending on the pasture.

"The other portions they don't even go to. It's no big deal when cattle are on only 100 acres; you can make them graze the whole thing," he explains, "but if they are on rangeland with varied terrain,

they often don't use some of it because of forage quality, slope, limited water access, etc."

A person can strategically change cattle-use patterns and grazing behavior with a protein supplement.

Cows are attracted to protein and/or high-quality forage. Thus, supplementation can be a management tool to help keep cattle where you want them to be.

"Even though supplement costs a lot, there are times it is necessary, and it can be an overall economic advantage," Bohnert says. "You might be using it not so much because you want to increase the cows' body condition, but because you want to be able to leave the herd out on fall or winter grazing and not have

to bring them home for another two months."

Being able to utilize pasture that much longer without having to feed hay, in most situations, can more than offset the cost of the protein and save or make the rancher a lot of money, especially when the price of hay is high.

Comparing supplement forms

Derek Bailey, professor in the Department of Animal and Range Science at New Mexico State University, has been doing studies for more than 20 years on the use of protein supplements to alter grazing behavior and distribution.

"I worked as a range management consultant in Nevada for five years, working for ranchers on public-land issues. Many of these issues involved cattle distribution. Usually there's enough grass, but cattle are grazing too much in one spot and not in others," he says. It's often a matter of getting them to spread out more evenly.

Prior to his current position, Bailey conducted research with low-moisture blocks at Montana State University.

The blocks are protein supplements containing urea and natural protein sources such as soybean meal and cottonseed meal, plus vitamins and minerals in a molasses mix. The manufacturers cook it and place it in a vacuum so it dehydrates and becomes very hard, he says. The mix is often put in barrels, plastic tubs or other types of containers. Some supplements are made by putting ingredients under hydraulic pressure to form blocks, while others use additives like bentonite to make them hard.

Bailey and his research team compared the low-moisture blocks to feeding cake and a liquid-molasses-based protein supplement with a lick wheel. The benefit of the low-moisture blocks was their versatility. They could be used in different sizes, and they were durable on the range. Plus, he says, cattle loved them and they got consistent intake.

In a New Mexico study, researchers compared a pressed block with low-moisture blocks.

"For the first month, the cattle didn't eat very much of either. The forage quality was still relatively good, and the protein wasn't an attractant," Bailey says. "Later in the season, the cattle started eating the low-moisture block and very little of the pressed block. These things only work well as attractants if the animals eat them."

Cows go to certain places because they love the supplement, not because of the grass, he says. However, they eat the grass nearby because they are already there.

"If the grass is a little dry or short on protein, they really go after the supplement because they need that nitrogen/protein to enable them to utilize the low-protein grass," he explains. "It helps digestion and has a good nutritional benefit, which makes it very palatable."

Using supplement to encourage grazing distribution on forage that is dormant and of low quality works best if there is always supplement available,

Feeding cake

There are various ways to feed supplement, but one of the traditional methods is to use pellets or "cake" that can be fed on winter pastures. This works well in pastures where you are not trying to make cows utilize certain areas; you can just drive out anywhere in the pasture and feed the pellets.

Frank and Jennifer Beel are part of a family ranch near Johnstown, Neb.

"We are the third generation and run about 1,200 cows, calving in spring and fall," Frank says of the ranch that's been in operation 76 years. "We put up prairie hay in summer, and in the fall and early winter, rely on grazing the aftermath. We start feeding the fall-calving cows and their babies hay in late fall when weather turns bad, but our spring-calving cows are on pastures we save for winter grazing."

Frank, 44, says his family has been using cake to supplement cows ever since he can remember. They used to get the supplement in 100-pound (lb.) bags. It took two people to feed it — one to drive the pickup and one to scatter cake from the back, he recalls.

"Now it comes in bulk, and it's a lot easier," he says, explaining that the co-op at Ainsworth, Neb., brings it to the ranch a semi-load at a time to fill their two overhead bulk bins. The Beels can drive under the bulk bins to fill the cake feeder, which holds about 1,200 lb., on their flatbed truck. They use the truck-mounted feeder to scatter about 3 lb. of cake per head every other day to their cows.

"With our spring-calving cows, we generally don't start feeding cake until about December, because they don't start calving until March. With our fall-calving cows, we start feeding cake in October to keep them coming along and ready to breed again. It can get pretty cold around Thanksgiving or early December," Frank says.

"The cows really like the cake and come to the truck. It's a very palatable pellet, and they don't waste any. We try to feed on grass or firm ground on the meadows. If we get into a patch of sand or mud, we shut off the feeder (from inside the cab) until we get onto good ground again and turn it back on," he explains.

Even if it snows, there are usually places where the snow has blown off, where cake can be fed on grass.



Above and left: The Beels can drive under the bulk bins to fill the cake feeder, which holds about 1,200 lb., on their flatbed truck. They use the truck-mounted feeder to scatter about 3 lb. of cake per head every other day to their cows.

"Once in a while we might have to quit caking for three or four days if snow gets too deep, but usually after the cattle tromp around, we go back to feeding. If there are no areas

where snow has blown off, we just go down the windrow where we've fed hay earlier, and put cake on that area, or go down the tractor tire track and feed cake where the snow is mashed down," he says.

"The cows don't waste any. If you go back afterwards you can't find any they missed; it's all cleaned up. The fall calves eat with their mothers and learn how to eat it. We used to wean our fall calves the first of March, but figured out it was cheaper to leave them on the cows a few more months. The cows teach them how to graze and the calves stay healthier, out on the pastures with their mothers," Frank says.

"The cake is easy to use and the company makes it with all the minerals and vitamins our cows need. They custom-make it to what we want, like when we feed MGA (melengestrol) to the heifers in the spring before breeding. If we want to boost vitamin A during calving season, they can do that for us. They also have different levels of protein, and we choose the most economical level that fits our operation and what our cows need," he explains.

Bailey observes. When cubes or cake were fed, they were consumed quickly and cattle left the desired area.

Bailey and his researchers evaluated how much supplement was wasted when fed as cake. “We were feeding cake in northern Montana in winter, and sometimes there was snow on the ground and sometimes not,” he explains. “We recorded (with a GPS receiver) where we fed it and went up a few days later or after the snow melted to that exact location to check — examining 10 to 12 feet on each side of the line where we fed.”

Feeding the cattle 4 pounds (lb.) per head every other day, there was very little waste, and generally what was wasted consisted of a few cubes that fell into a fecal pat.

“But when they finish, they know there is nothing left there, and they didn’t stay in the area,” Bailey reports. Cows will follow you anywhere you want to take them when they know you are going to feed them, but after they eat the feed, they have no reason to stay there.

The cows spent an average of an hour within about 100 meters of where the cake was. It was fed in a typical fashion of many ranchers — drive to an area with several cows and honk to signal to the cows that it is feeding time. The researchers waited till all of the cows were there, looked them over and then fed. Bailey says the cows ate quickly, grazed a bit, then left.

“On average, when we did that through the whole winter, they spent about an hour a day in that location, and then wandered off, compared to spending about five hours a day within 100 meters of where we put the low-moisture blocks. With the blocks they know there will still be some protein there. They tend to go there in the evening to lick on the blocks and maybe loaf there all night, and graze there again in the morning,” he notes.

“When we used a lick wheel it worked nicely, too. The problem with those is the challenge of hauling liquid supplement around in the mountains — and in the cold weather in Montana it didn’t work very well. In sub-zero weather, liquid molasses supplements are a challenge. It’s difficult to haul, and the consumption rate was too high — well over twice what the manufacturer had hoped,” he says.

It worked very well as an attractant, but the cattle ate too much, making it too expensive for practical purposes.

“With low-moisture blocks, consumption rate was close to what the manufacturer stated, which was between ½ pound and 1 pound per day. Often the consumption rate on our cattle was about seven-tenths of a pound. With the lick wheel, by contrast, they were consuming about 2 pounds daily on a dry-matter basis,” he says.



Left: The benefit of the low-moisture blocks was their versatility. They could be used in different sizes, and they were durable on the range. Plus, he says, cattle loved them and they got consistent intake.

