

Better Bulls With Peas

As both bull buyers and seedstock producers zero in on factors influencing development and longevity, one legume is emerging as a bull feed favorite.

Story & photos by **Ed Haag**



► Rumen content samples taken from the cannulated calves showed that peas in their diet decreased ruminal pH and increased ruminal concentrations of volatile fatty acids and ammonia.

Dave Grunewaldt isn't the sort of individual who believes everything he hears. The Angus seedstock producer from Moranda, S.D., admits that he had more than a trace of skepticism when he first heard about how adding field peas to a growing bull's diet could improve performance and development; however, after conducting some experiments of his own, Grunewaldt confesses that he is a convert.

"There is no question that peas have made a major contribution to our seedstock program," he says. "The feed efficiency with ground peas is remarkable."

Studies conducted at North Dakota State University (NDSU) alerted Grunewaldt to the possibility that peas, as a protein source, might offer a more rumen-friendly ration than the one he was used to feeding.

"I had to see the results for myself," he recalls. "Seeing is believing."

Grunewaldt divided his young animals into two feeding groups. One, made up of his bull calves, was fed a diet that consisted of 3 pounds (lb.) of ground field peas and 6.5 lb. of blended distillers' grains. The other, made up of his heifer calves, was fed exactly the same amount of distillers' grains; but, instead of peas, they received 2 lb. of 46.5%-protein soybean meal. Both groups received the same forage mix of earlage, silage and hay. Both had their final rations balanced to 15.5% protein.

"Right off the bat, the heifer calves scoured on us and we had to back off the soybean meal by a half a pound," Grunewaldt recalls, adding that stabilizing his heifers proved a major task. "With the heifers getting acidosis, you couldn't keep them on feed. You couldn't regulate intake. First you'd have to cut them back. Then you'd try to build them back up, and you just couldn't get it done."

On the other hand, not only did the pea-fed bulls not scour, they actually displayed characteristics that Grunewaldt associates with high rumen function and feed efficiency.

He notes that there was a consistency to his bulls' feeding habits that was absent with the other group. "Unlike the heifers, the bulls didn't gorge themselves," he says. "Instead, they would eat some feed, go drink some water, walk around and then go back to the feedbunk."

That consistency, Grunewaldt says,

played an important role in controlling acidosis and other eating disorders associated with poor rumen function. He also associates that consistency with better hoof development and greater longevity.

For Grunewaldt, a key indicator that peas were responsible for improved digestion was found when the excrement from the two groups was compared.

"In the bull calves' fecal matter, the feed was so well-digested you could not tell what was in the ration," he says. "In the heifer calves' fecal matter, you could see both the cobs and corn from the earlage, as well as the long leaf strips from the corn silage."

Genetics well-suited to peas

Dewayne Siebrasse, Grunewaldt's nutritionist and operator of Cattle Cents Consulting Inc., Aberdeen, S.D., is also convinced that ground field peas can play an important role in a bull and heifer development diet. He has integrated ground peas into the rations of several Angus seedstock operations and is impressed by the results.

"We are seeing some tremendous muscle and structural development," Siebrasse says. "At the same time, we are keeping the cattle functionally sound because they are being fed lower-energy diets."

He notes that lower-energy diets reduce the likelihood of foot problems later. His clients normally feed a 0.45-megacalorie-(Mcal)-per-lb. diet to the heifers and 0.49-0.50-Mcal-per-lb. diet to the bulls.

For Siebrasse, one of the real nutritional advantages to feeding peas is the legume's slow, but thorough, rate of digestion.

"The field pea digests six times more slowly than soybean meal," he says. "So in a ration that includes peas and distillers' grains, you get the advantage of the digestion of the field pea protein in the rumen, while the bypass protein in the distillers' grain is being digested in the true stomach."

This balanced digestion process allows cattle to increase their intake without exhibiting disorders normally associated with overeating. "With field peas in the diet, we see anywhere from a 2- to 4-pound increase in dry-matter intake and anywhere from a 6- to a 10-pound increase on an as-fed basis for a total mixed ration," Siebrasse says.

He notes that one client, who has started adding peas this year, has seen an increase in intake in his heifers from 35 lb. to 44 lb. a day as fed, while his bulls have moved up from 40 lb. to 50 lb. a day as fed.

Siebrasse is quick to add that NDSU

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research shows that feed efficiency is also improved when peas are added to the diet.

This all adds up to increasing a calf's daily weight gain without having to push the energy component in its diet, Siebrasse says. "We are getting Angus bulls gaining four and a half pounds a day. That is unheard of on a 50-megacalorie-per-pound diet."

He attributes much of this success to how modern Angus genetics respond to the protein in the peas and in the distillers' grains.

"We are running up to 16% protein on our bull development diets," Siebrasse says. "The old philosophy that you run 13% just doesn't work with the powerful genetics in today's Angus cattle."

Getting a jump-start

Anxious to take full advantage of their cattle's high-performance genetics, Siebrasse's clients introduce their calves to

peas early, most often starting them with a creep feeder.

"We try to run 20% to 25% field peas with a mix that includes distillers' grains, corn, oats, soybean meal and a Rumensin® mineral mix," he says. "The field peas will increase the protein of the mixture and increase the digestibility of the other feedstuffs."

Siebrasse's interest in using field peas to enhance early bull development was sparked by the work of NDSU beef researcher Vern Anderson, who saw the opportunity to improve weight gain in young animals by feeding well-balanced, high-density feed that increased intake and offered higher feed efficiency.

Anderson found peas particularly well-suited to this task, providing immature animals with limited intake capacity the protein necessary to promote healthy rumen development. "Getting the right nutrition into these calves is essential for their future performance," he says, adding that this holds particularly true for seedstock that have longevity requirements.

Anderson's research involved creep-feeding calves at 120 days. During a 56-day period, the animals were fed varying

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► Grazing calves receive early benefits from peas in their diet.

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mixtures of wheat midds and ground field peas, ranging from 100% wheat midds to 100% peas.

What Anderson determined from the study was intake increased proportionally to the amount of peas included in the creep ration. Calves that received 100% midds consumed an average of 5.89 lb. of creep feed per day, while calves offered 100% peas managed to eat an average of 8.72 lb. per day.

Weight gain was also proportional to the level of peas in the diet, as was feed efficiency when the percentage of peas in the mix was kept at less than 67%.

Another study used ruminally cannulated nursing steer calves to determine the effects of a field-pea-based creep feed on ruminal fermentation characteristics, forage intake and digestibility while calves grazed native rangelands. While no differences in forage intake were found between those calves that received peas and those that did not, the pea-supplemented calves had greater total intake than the other calves. Rumen content samples taken from the cannulated calves showed that peas in their diet decreased ruminal pH, but increased ruminal concentrations of volatile fatty acids and ammonia.

For both Anderson and Siebrasse the palatability of peas is a key attribute in keeping developing animals on feed and on track to reaching their genetic potential. Pea palatability also has a positive effect on calf health, Anderson says, concluding that with a highly palatable feed such as peas available, calves are more likely to have a stable fermentation pattern, which reduces the digestive disturbances that are responsible for a variation in feed intake.

He adds that this is particularly important during periods of severe stress, such as immediately after weaning. “We have found

in our studies that postweaned calves that were fed peas in their diet consumed more feed than the non-pea control group.”

Producer makes switch

Doug Stevenson of Stevenson-Basin Angus Ranch, Hobson, Mont., has thoroughly researched the role peas might play in a high-quality bull and heifer development program.

“We wanted something to replace the grains that we have been feeding since I was a kid,” Stevenson says. “Barley and corn — because of their high starch content — have to be used very carefully to avoid bloat and foot problems.”

For Stevenson, selling seedstock with good feet is imperative. “We sell bulls to ranches all over the country, so our animals must be able to deal with every kind of terrain,” he says. “Foot health is a very big concern to us.”

In addition, Stevenson could see that the cost of delivered corn was inching up as shipping companies responded to higher fuel prices. Add to that the predictions of corn shortages due to increased ethanol production, and Stevenson was convinced that in order for his seedstock operation to survive in a region where low-cost byproducts weren’t easily available he needed to identify a high-quality grain equivalent that could be produced locally.

Finally, Stevenson-Basin’s bull center — a confinement site specifically designed to house high-performance bulls — presented Stevenson with a whole set of unique nutrient management challenges that could

only be resolved by integrating all segments of his operation into a single comprehensive sustainable model.

“With the number of bulls we raise, we have had to file a nutrient management plan,” he says. “That means we have to account for all the nutrients we apply back on the fields.”

Surprisingly, Stevenson found the answers to all three of these pressing questions in a single plant — the common feed pea. As he looked into the research and began to

introduce ground peas to his cattle, Stevenson soon realized that the legume provided his bulls with a slow-digesting feed ingredient that stabilized rumen function while optimizing intake and feed efficiency.

“There is an aspect to the makeup of the peas that appears to us as being more healthful to our bulls than barley or corn,” Stevenson says.

Equally exciting is the prospect of not having to purchase large quantities of feeder corn in the near future. This year Stevenson has replaced half of the corn in his bull ration with ground peas.

“In Montana we can grow peas, and they work as a real viable alternative to corn,” he says. “This will help us in our efforts to be more self-sufficient.”

Growing peas as feed is just half of the equation, Stevenson says. The versatile legume also plays an important role in his nutrient management program.

“In our nutrient management plan, the limiting factor on how much manure we can apply on a field is phosphorous,” he says. “Peas use more phosphorous than any other crop we can grow.”

Manure from the bull center is applied to specified fields in the fall and then planted to peas the next spring in order to pick up the phosphorous. The following year, a grain crop is planted to take advantage of the nitrogen that is left over from the manure and is fixed by the peas.

“We are now moving into a truly sustainable system,” Stevenson says, “and peas are a big part of it.”



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Table 1: Comparison of nutrients in field peas with other feedstuffs, DM basis

Item	Field peas*	Corn**	Barley**	Wheat midds**	Sunflower meal**	Canola meal**
Dry matter, %:	89	89	89	89	92	82
TDN, %	87	90	88	80	65	69
NE _g , Mcal/lb	0.67	0.70	0.63	0.58	0.40	0.45
Crude Protein, %	25.3	9.8	13.2	18.7	26.0	40.9
Calcium, %	0.15	0.03	0.05	0.17	0.45	0.70
Phosphorous, %	0.44	0.32	0.35	1.01	1.02	1.20
Potassium, %	1.13	0.44	0.57	1.81	1.27	1.37

*NRC, 1984.
**NRC, 1996.
Source: North Dakota State University.

Editor’s Note: To see other past Angus Journal articles about corn coproducts, including DWGS and DDGS, do a back issue search at www.angusjournal.com/aj_backissues.html.