PURINA Checkpoint®
Management & Nutrition Tips For Beef Producers

Trace Mineral Bioavailability:
it's complicated, and it's crucial to the health of your herd.

Trace minerals. They're everywhere, and they have a huge impact on the health of your herd. But, because they exist in such highly variable concentrations from one place to another, it's hard to know just how much of a particular mineral your herd is getting.

To make things more complicated, in many regions there are also a number of antagonists in the soil and forage; these substances inhibit the absorption of other minerals in the cow's body. And, without proper absorption, the animal cannot reap the benefits of the minerals, no matter what the concentration.

Dr. Jerry Spears, Professor and Director of Graduate Programs in the Department of Animal Science at North Carolina State University says the percent of any mineral absorbed also depends on the mineral and how much of it cattle are getting in their diet.

"With many trace minerals, if you supplement a level much higher than what is required, the animal's body will reduce the absorption of that mineral as a way of avoiding toxicity," Spears explained. Likewise, "if a mineral's level is low in the animal's diet, the animal will absorb and utilize a mineral at a higher rate.

He explained that minerals are absorbed at widely varying rates, from 1 percent up to 90 percent. Iodine is on the high end of that scale. For other minerals an absorption rate of 30-40 percent would be quite high. Trace minerals include copper, iodine, iron, manganese, molybdenum, selenium and zinc.

To achieve the desired absorption rate of these minerals, it is first necessary, of course, to have an adequate supply of the required minerals in the herd's diet. Once needed minerals are readily available and in adequate concentrations, the number one external factor affecting absorption rates is the level of other minerals in the diet, according to Spears.

High levels of sulfur or molybdenum, for example, will substantially diminish the absorption of copper, Spears said. Forage can contain higher-than-average levels of molybdenum and sulfur, he added, and many byproduct feeds, such as distiller grains can also be high in sulfur.

"Another important mineral that is often high enough to have a negative effect is iron," Spears indicated. "Iron can be very high in forages and can decrease the absorption of copper and manganese. Iron in forages is affected by soil type and soil pH, but iron is high in a lot of areas of the United States," he added.

In some areas of the country, cobalt and iodine levels are low enough to be a source of concern, he said, even though the requirement is low. In these areas, he suggested it might be a good idea to supplement to meet requirements.

In general, copper, selenium and zinc are most likely to be deficient in forages, according to Spears, although deficiencies will always vary in different areas of the country, even within a state. When supplementation isn't adequate, and deficiencies arise, producers will most commonly see sub-clinical deficiency signs such as a slight reduction in growth or reproduction. However, in many cases, such symptoms go unnoticed.

More serious deficiencies may affect the immune system of cattle, resulting in a greater incidence of certain diseases. In those cases, the disease is, technically, the cause of death; but the real culprit is a mineral deficiency. He said that three trace minerals have been well-documented to affect immune function: zinc, copper and selenium.

"Selenium deficiency can also result in damage to the heart in young animals, or muscle damage to legs, resulting in death due to heart failure or failure of calves to nurse due to pain in their legs when they walk" explained Spears. "Selenium is likely to be deficient in many areas because soil is deficient in selenium in many areas of the country, notably most parts of the Midwest and Corn Belt—and also in many parts of the southeast. Then, there are small pockets where selenium can be high and actually cause toxicity problems," he added. "Selenium works along with Vitamin E as an antioxidant to prevent oxidative damages to tissues."

Copper is another common mineral deficiency in cattle, he said. The most obvious signs of this deficiency are a rough hair coat, depigmentation of hair and reduced growth, particularly in young animals.

Spears acknowledges that it's difficult for producers to know if they are providing adequate mineral supplements. Nevertheless, he says he regards mineral supplements as an insurance policy. His advice for cattle producers?

(Continued from Cover)

"Buy a good supplement and observe your cattle. If you are seeing specific problems, you need to have a nutritionist or veterinarian come in and help you. If your cattle need more of a particular mineral than they get in a good supplement, you will need professional help. In most cases, with a balanced mineral supplement, though, you shouldn't have a problem."

Purina's Wind & Rain® Minerals are available in a variety of formulations to meet your cattle's needs. To learn which Wind & Rain® mineral product will be the most effective in your herd, contact your Purina dealer or you local Purina representative today.

KEY TERMS

Trace minerals: A chemical element required in minute quantities by an organism to maintain proper physical functioning. These include copper, iodine, iron, manganese, molybdenum, selenium and zinc.

Bioavailability: the amount of a given nutrient that is absorbed and utilized by an animal

Antagonist: one substance that inhibits the absorption of another

Benchmarking Reproductive Performance

With spring-calving herds, we spend a lot of time each fall writing down numbers—animal ID … weaning weights … pregnancy … calf age. And it all seems to wind up in a notebook in the barn or on the office computer, never to be seen again. If we evaluate these numbers annually, however, they can help us make better management decisions.

For instance, we can compare them to industry benchmarks to evaluate such things as the reproductive performance of the herd.

When we benchmark, we compare the performance of a specific herd against accepted targets. In most cases, these targets are production output numbers such as percent pregnant or pounds weaned. These measures must be defined in a standardized way across all herds so that we truly get an "apples-to-apples" comparison. Four important benchmarks to evaluate reproductive efficiency are:

Overall pregnancy rate—calculated as the number pregnant divided by the total number of females exposed for breeding, multiplied by 100. Depending on herd size, location and length of breeding season, we would expect > 90 percent of females to become pregnant in a limited breeding season (60–90 days).

Percent pregnant in first 21 days of breeding—calculated as the number of females pregnant in the first 21 days of the breeding season divided by the total number of females exposed for breeding, multiplied by 100. At least 60 percent of the total number of herd pregnancies should fall into this time frame. To calculate this number, you must age the fetus (via palpation or ultrasound) and record the date the breeding season started and ended.

Pounds weaned per exposed female—perhaps the most useful benchmark of all because it can be affected by reproductive efficiency, calf growth rate and the overall animal health program. Add up the total number of pounds weaned and divide by the number of females exposed to produce those calves. A reasonable starting target would be 475–525 lbs. However, this benchmark varies widely due to environmental conditions and herd genetics, so it is critical to track it annually in your **individual** operation.

Late-term abortion rate—After pregnancy checking your cows, you won't be able to calculate this benchmark until the end of the 2012 calving season. To calculate this number, compare the number of cows **expected** to calve with the number that actually do produce a full-term calf (live or dead). Obviously, cull cows are not included. This benchmark should **not exceed 3 percent.** For example, if you expect 100 cows in your operation to calve, at least 97 of these cows should deliver a full-term calf.

Obviously this is not a complete list of benchmarks; others deal with calf performance and input costs. However, using just these four provides a starting point that may have a profound effect on your herd's profit potential. Operations that fail to meet these targets tend to have issues in at least one of three areas: grass management, supplemental feeding or animal health. So, as you're collecting those numbers this fall, take the time to actually use that data to evaluate your herd's performance. That's where the decision-making process should begin.

Terry J. Engelken, D.V.M., M.S., Associate Professor, Veterinary Diagnostics and Production Animal Medicine, Iowa State University

Cattle Starting Program Matches Your Objectives and Resources

Purina has just announced their new Great Starts® program – a line of cattle starters designed to match your feeding program objectives and the resources you have available for your operation. So, no matter what forage, labor or facilities you have, there is a Purina starter program to match each individual situation. According to Rod Nulik, Beef Cattle Marketing Manager, "Purina has never offered a 'one size fits all' type of approach to starting cattle, but with our new Great Starts program, you now have even more flexibility to provide your cattle with the most effective and efficient nutrient package available. We help you customize a feeding program based totally on the resources you have on your farm or ranch."

Purina's starter products are designed to regulate the number and size of meals cattle will eat, resulting in optimized feed efficiency and potential reduction in digestive and metabolic problems in starting cattle. And, these products contain Diamond V® Original XPC™, research proven to improve palatability while optimizing daily gain, feed conversion and cost of gain in weaned calves. The inclusion of Zinpro Corporation Availa 4® trace minerals at full-rate also helps support immune function during this critical starting/receiving phase.

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Impact® Starter and Impact® Beef Grower Deliver Results for Missouri Rancher

When it comes to starting cattle on feed, Brent Murphey is sold on Purina products. He and his wife, DeEtta, and their two sons run a 200-head cow-calf operation in Houstonia, Mo., about 70 miles east of Kansas City. Their operation is predominantly registered Angus cows, but they also sell about 40 bulls a year and raise their own hay on their 550 acres.

Over the years, they have tried a number of strategies to get their spring and fall calves weaned and in prime condition for the feedyard or reproduction. But then, three years ago, after experiencing some quality problems with another brand's starter program, they began using Purina's Impact® Starter and Impact® Beef Grower. They were so impressed with the results that they've made it a mainstay of their calf development program.

"We wean all our calves on Impact Starter now, and our performance is really unbelievable," said Murphey. "It seems like when we hand-fed, the calves went backwards or stayed the same. With Impact Starter they look better a week after you wean them than they did on the day they were weaned. Our gains in those first two weeks of the weaning period are phenomenal. The first group we tested gained, on average, four pounds a day."

He says calves eat the product readily and stay healthy, too.

"We've had minimal sickness and our feet are good. I don't think I've ever treated one for bloat. And, in the last three years I think we treated one calf (for anything) during that 14-day period on the starter feed," he explained.

Then there are the logistical advantages. Impact Starter eliminates the need for hand feeding, something Murphey says has been a real advantage on his farm, where they are often "short of help." And, it offers a smooth transition to regular feed, such as Accuration®—they "go right on eating and don't miss a beat."

The consistent quality of the batches is something else he has noticed, along with the way it evens out the condition of herd.

"Some cattle come in in good shape, some a little greener, but by the end of that 14-day period that I've fed Impact

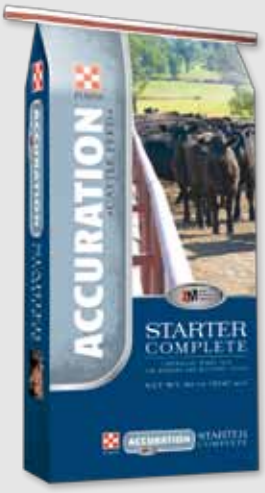
Starter, they've really evened out in terms of their bloom and haircoat and health," Murphey commented.

He credits Purina's research for all these benefits, noting that by the time he gets it, very little additional fine tuning is needed. His Purina dealer, Ricketts Farm Service in Salisbury, Mo., also has lived up to his expectations, delivering products and answers to questions in a timely manner.

All in all, it's a proposition that Murphey says is well worth the cost.

"A lot of people probably look at the cost side of it, and that determines a lot more than it should sometimes. I used to be that way," he admits. "When we first talked about this Impact Starter, it was a little higher than what I was using, just by the ton. But, nowadays you can't figure feed by the ton. You have to figure by your cost of gain and what it does for you, because in essence, cheap feed is still cheap feed."

Talk to your local Purina Dealer today about how these products can be used in a customized program for your herd:



Purina Accuration® Starter Complete HL, WC & LW Feeds: Three new complete starters for weaning and receiving cattle weighing from 350 to over 600 lbs. Proper nutrition is essential to help minimize metabolic disorders and support rumen health. Fed as the sole ration, these coarse-textured feeds, which include roughage, utilize INTAKE MODIFYING TECHNOLOGY® to help assure the targeted intake of 3% of body weight is achieved. The new Accuration Starters were developed to replace Impact® Starters. These products deliver all of the Impact benefits you expect, but the improved formulations also include Zinpro Availa 4® trace minerals to provide more balanced nutrition.

Precon™ 5 Feed: Pelleted supplement that provides the essential nutrients in a small inclusion package (5 lbs per head per day) for stressed cattle.

Preconditioning Receiving Chow® Feed: The sole ration in a palatable, complete pelleted feed designed to restore nutrients lost due to the stress of weaning and shipping.

Purina® Wind and Rain® Availa 4® Mineral Tubs and Purina® Stress Tubs provide a palatable, molasses based source of essential vitamins and minerals. Placed in the weaning/receiving pen, they provide extra assurance that even timid cattle will be provided these critical nutrients.

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Quick Tips:
Putting the Brakes on Pasture Bloat

Pasture bloat is a constant menace for cow calf operations, especially during spring and summer. The incidence of bloat—basically indigestion caused by excessive accumulation of gas in the rumen—can be influenced by a wide variety of factors, including types of forage, weather, time of day, mineral nutrition, feeding practices and the inherited tendencies of animals. Here are a few tips to help reduce the incidence of pasture bloat in your operation.

√ Since legumes are known to cause bloat more than grasses, plant mixtures of legumes and grasses. Make sure no more than 50 percent of the total mix is legume.

√ To stimulate grasses and keep them dominant, fertilize grass-legume pastures with nitrogen.

√ Plant legumes with lower bloat-causing properties. Some possibilities are birdsfoot trefoil, lespedeza and sweet or red clover.

√ Provide poloxalene or other anti-foaming chemicals 2-5 days prior to turning cattle onto pasture. Research has confirmed that poloxalene can reduce the occurrence and severity of bloat. Use it as topdressing, in blocks, liquid or pre-mixed with grain.

√ Utilize ionophores, available in various feed and supplement formulations.

√ Keep cattle from grazing on young or blooming legumes.

√ Include mineral supplements that provide sufficient sodium; keep potassium, calcium and magnesium levels moderate.

√ Provide hay, grain or crop residues while cattle are grazing pastures with high bloat potential.

√ Avoid turning hungry animals into pastures with bloat-causing plants; feed them dry hay or grass first.

√ Don't turn animals out on "high-bloat" pasture when the plants are moist from rain, dew or irrigation.

√ Try to keep forage quality relatively consistent when moving animals from pasture to pasture. Dramatic changes in forage quality can increase the risk of bloat.

√ Don't move animals from paddock to paddock too frequently; this can prevent animals from adapting to a particular forage, and encourage bloat.

For more information about bloat prevention and treatment, contact your Purina dealer or your herd veterinarian. Purina offers a complete line of supplements and minerals, many with Intake Modifying Technology®, to assure your cattle perform up to their genetic potential.

Sources: Rasby, Rick, Anderson, Bruce and Randle, Richard. Bloat Prevention and Treatment in Cattle, University of Nebraska-Lincoln Extension Publication G2018, May, 2010., Ruffin, B.G. Controlling Bloat in Cattle, Alabama Cooperative Extension. ANR-148, April 1994., Parish, Jane and Rhinehart, Justin. Feed Additives for Beef Cattle Diets, Mississippi State University Extension Service Publication 2518, January 2009.

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TRACE MINERAL BIOAVAILABILITY

BENCHMARKING REPRODUCTIVE PERFORMANCE

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