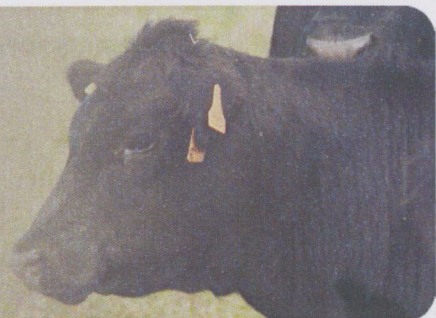




Beef Briefs

The Latest Information
on Beef Cattle Nutrition



Beef animals can't do well without mineral supplementation

by Pedro Nogueira

Herd health and vaccination programs tend to get most of a producer's management focus. Feeding minerals to beef cows seems to be an item of lowest priority to some cow-calf producers. This is partly due to the perception by most producers that minerals are not a problem, or that they are difficult to diagnose (i.e., masked by other problems such as energy or protein deficiency). This time of the year is a good time to make sure calves are getting extra nutrition, so they can go on and perform well at the feedlot. An important step to ensure this is to feed them creep feed. Creep fed animals tend to do better in terms of weaning weights and adaptation to feedbunk at the feedlot. Heifers and cows also need special attention through the fall and winter, to ensure a healthy calf crop and better breed back next spring.

Why should I be interested in supplementing minerals to my cowherd?

Minerals play a vital role in forage digestion, reproductive performance, the immune system, and the development of bones,

muscle, and teeth. Sub clinical trace mineral deficiencies occur more frequently than recognized by most livestock producers. This may be a larger problem than an acute mineral deficiency, because the beef producer does not see specific symptoms that are characteristic of a trace mineral deficiency. With a sub clinical deficiency, the animal grows or reproduces at a reduced rate, uses feed less efficiently and operates with a depressed immune system.

In an interview given to the magazine American Cowman, Montana Extension beef specialist John Paterson says that proper calfhood vaccinations and mineral nutrition at the farm go hand in hand. Trace mineral nutrition can have a significant carry-over effect on feedlot performance and health of calves. Specifically he says "The reason we often see sickness in the feedlot is probably due to lack of mineral management starting in the cowherd. A nutrition program is important from conception through the feedyard so the animal's genetics can be fully expressed."

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Volume 1, Issue 1
January 2009

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When should I supplement my animals?

Mineral and vitamin supplementation is always important, because all animals have at least maintenance requirements for normal functioning. Nevertheless, availability of free choice minerals is especially critical in the three months leading up to calving and then immediately after calving, when the cow has increased energy and protein requirements. Thus, minerals are especially important during the last 90 days before calving and then through the breeding season. Providing minerals prior to weaning can also help produce a better immune response and weaning weights among calves.

Recently, we had a producer comment that he had more than normal "stillborn" calves. This producer had used very little mineral in the past 12 months so we asked the question to our ISF Ruminant Nutritionist:

"Of the trace minerals, manganese has been specifically related to older cows and stillbirths. Common issues with stillbirths and trace minerals can be related to manganese, zinc, iodine, copper and selenium. As well look out for vitamin A and E deficiency. Vitamin A deficiency in regards to mouldy forage – unfortunately happens too often – often I'll hear, they are just dry cows, they don't need anything special – yikes!!! Vitamin A deficiency in this case will produce not only stillbirths, the cows won't clean properly and/or they will have blind calves."

Another evidence of the importance of minerals and



vitamins can be seen from a recent article published in the Ontario Beef Farmer magazine. In this article the author, a veterinary from Temiskaming, referred a situation where one of his customers was having problems with his calves being "sluggish... and a lot of the calves seem to take forever to stand up and nurse. If we want to help them onto the cow, they seem stupid and don't want to suck properly. They just kind of stuck their tongue out."

The vet, after some checking, arrived to the conclusion that probably there was a deficiency on vitamin E and selenium. The mineral the farmer was feeding had 1000 IU/kg of vitamin E which translates to 100 IU per cow per day at a feeding rate of 100 grams. They changed the mineral to a higher vitamin E level and within a week of this change, the farmer reported that his calves seemed like "completely different animals. They seem to hit the ground, stand up, turn around and go after the cow's udder. Also, most of the cows are passing the afterbirth almost on top of the calf."

Trace Element Deficiencies

Diagnosis of trace mineral deficiencies can be very difficult, even for professionals. It is likely that most of the trace mineral deficiency problems experienced by cattle are of a sub-clinical nature. In Alberta, several "Farming for the Future" projects have demonstrated 20 to 36 lb (9 – 16 kg) increases in weight gain in yearlings on pasture through trace mineral supplementation. In other projects where cow/calf pairs were provided with trace mineral supplements, improvement in weaning weights of 14 to 26 lb (6.4 – 11.8 kg) have been seen. It is interesting to note that reduced growth rates were not seen as a problem in these herds.

Improvements in reproductive performance of cows and heifers have also been observed with adequate trace element supplementation. More cows conceiving earlier in the breeding season resulting in increased weaning weights and fewer open cows have been common observations.

Also, studies done with heifers, comparing no supplementation to supplementation with Cu, Zn, Mn, Fe and Mg (organic forms), showed the following results (Table 1) (Paterson and Engle, 2005).

Measurement	No mineral supplement	Cu, Zn, Mn, Fe and Mg Supplementation
Infections (bacteria isolated from cervix & uterus), %	25	5
Ovarian activity (mature follicles 30-80 days after calving)	20	35
Embryonic mortality (palpated embryonic depression 3 5-55 d post-insemination, %)	20	0
Incidence of endometrial scarring, %	58	10

Recent research has demonstrated that copper, zinc, manganese and selenium are required for optimum functioning of the immune system in cattle. This suggests that adequate supplementation of these trace elements would be beneficial in helping the cow and her calf cope with disease-causing organisms that they would normally be in contact with.

References:

"Supplemental minerals are important to enhance future cow and calf performance". Kindra Gordon. American Cowman, 2008.

"Trace mineral nutrition in beef cattle". John A. Paterson and Terry E. Engle. Presented at the 2005 Nutrition Conference sponsored by Department of Animal Science. University of Tennessee.

"Trace Minerals for Beef Cows". Alberta Agriculture and Rural Development, 2008.

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"Dummy Calf Syndrome"

Dr. Lance Vales, DVM

"Doc, I'm losing calves and I need you to come out and take a look". Bob was an excellent producer, with 80 head of Char X cows. A quick check of the clinic records confirmed that Bob was current with his herd vaccinations, including protection against common causes of calf scours. Like many producers, he had been unwilling to "give away" cows during B.S.E., so his herd size had increased. He had failed

to expand his calving yard to match. Two years ago, he had suffered through an outbreak of calf scours that overcrowding inevitably brings. Since that time, we had instituted a system of moving cow-calf pairs out of the yard weekly (modified Sandhills system). This had worked very well, and dropped calf mortality back to almost zero. Today's problem was different.

Bob was waiting when I pulled into his yard *"Doc, the calves this year seem to be really sluggish. We've had a few stillborns, and a lot of the calves seem to take forever to stand up and nurse. If we try to help them onto the cow, they seem stupid and don't want to suck properly. They just kind of stick their tongue out. Once they get scours or pneumonia, they die very quickly. Nothing that we treat with seems to be helping."* A quick check of

the farm helped to rule out many of the common contributors to calf illness. The cows were clean and in excellent body condition. I counted seven full round bale feeders in the calving yard, so competition for feed and fighting were less likely to be an issue. The pack was well built up and bedded. The older cow-calf pairs in the next yard looked fine as well. Bob told me that he had used the same bulls as the previous year, and hadn't had any problems. We then checked out his feed, the alfalfa-grass mix hay was green and leafy. He had a separate shed where he kept it stored. It was when we looked at his mineral that we uncovered the source of the problem.

The cows seemed to be eating enough mineral, they were consuming just over two 25 kg bags per week, however the vitamin E level was very low (1000 IU per kg, which translated to 100 IU per cow per day). Selenium was adequate (60 mg per kg, or 6 mg per cow per day). In the Temiskaming area, soils and water also have high iron levels, which interfere with the absorption of selenium. Blood samples taken from a number of cattle and horses in the region support the diagnosis of

widespread deficiency. They seem to be particularly severe following a wet summer.

What is Vitamin E/ Selenium Deficiency?

Many farmers are familiar with the classic symptoms of vitamin E/ selenium deficiency (sudden death in growthy calves, coupled with gritty white streaks in the muscles of the legs, diaphragm, and heart). It is better known as "White Muscle Disease". Recently, we have started to speculate on the role a vitamin E/selenium deficiency may play in what can be termed "dummy calf syndrome". Typical signs include calves that are slow to stand after birth, and may have difficulty in nursing. If you try to assist them onto the cow, they don't seem to be able to suckle properly, and may have their tongue hanging out of a corner of their mouth. These calves don't seem as hardy, and will experience a higher death loss due to scours or pneumonia.

In cow herds, it is well documented that a vitamin E/ selenium deficiency will result in higher levels of mastitis and retained placentas, and reduced fertility. There is also some thought that a deficiency will

also contribute to higher levels of vaccine reactions.

What Do Vitamin E/ Selenium Do?

Vitamin E and selenium work together as powerful antioxidants in the immune system. They are vital in helping the body recover from the day to day damage that we inflict on it. In "Dummy Calf Syndrome", that role is to help the brain recover from the damage inflicted during delivery, whether it be from direct compression on the head (cerebral vascular incidents, or C.V.I.), or acidosis brought on by a temporary lack of oxygen. The problem tends to be most pronounced in bigger calves or difficult deliveries.

Can it be Injected it into Newborns?

We have tried using injectable forms of vitamin E and selenium, however it seems to take a number of days before we notice an effect. In the deficient newborn calf, it is simply a case of "too little, too late". The effect of the injection only seems to last for approximately 3 to 4 weeks, after which time we may start to see calves dying from the more typically recognized "White Muscle Disease". It is more useful in an outbreak of "dummy calf syndrome" to inject cows as they start to "udder up" (approximately 1 - 2 weeks prior to calving), so that calves are protected prior to birth.

What About Bob's Herd?

Blood tests on a few of Bob's cows confirmed low vitamin E levels. Bob switched to a higher

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vitamin E dairy mineral, which delivered 1500 IU of vitamin E per cow per day. It cost him an extra \$2 per bag. Studies have shown beneficial effects of supplementing up to 4000 IU of vitamin E per cow per day. There really isn't adequate research out there to tell us how much we should be supplementing cows. Many feed companies have settled on a standard 1000 IU per day for dairy cows, but will cut back for beef. Talking with other veterinarians, most recommend a daily intake between 1000 and 1500 IU of vitamin E and 5 to 8 mg of selenium for a beef cow prior to calving. Additionally,

there are organic forms of selenium which are much better absorbed by the animal, but they also come at additional cost.

Within a week of the mineral change, Bob reported that his calves seemed like "completely different animals. They seem to hit the ground, stand up, turn around and go after the cow's udder. Also, most of the cows are passing the afterbirth almost on top of the calf." Bob didn't lose a calf the rest of last spring. He decided to stay on the higher vitamin E level throughout the year (instead of starting one month before calving), and we anticipate less trouble this

coming calving season.

Though huge advances have been made in the field of cattle nutrition over the past two decades, this composite case report highlights many areas that still need more research. We need answers to simple questions such as "what effect do varying levels of vitamin E/ selenium supplementation have on colostrum quality? (antibody level)", or on cow fertility?. What about calf vigour? (time it takes to stand and nurse). Hopefully we will be able to refine (or refute) some of the suggestions in this article.

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