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Lesser-Known Effects of Selenium Deficiency

Living in Ontario, we are in an area deficient in selenium, some areas more effected than others. Due to this, our crops are not a sufficient supply of selenium on their own. Selenium is a mineral found in soil and is needed to prevent muscle damage. As such selenium needs to be supplemented throughout life either through rations that incorporate it or through injections.

White muscle disease is a condition well-known to be associated with a deficiency in selenium. White muscle disease is a disease that mainly impacts quickly growing animals, such as newborns, that have not received sufficient selenium from their dam, either in the womb or through their milk. It is typically seen shortly after birth with an animal that appears to have normal function of their legs, but they can not stand on their own and they are generally weak. Their muscles can be painful when touched. It can also affect their tongue leading to problems eating and affect their heart making them weak. Breathing can also be affected as the diaphragm is a muscle that requires selenium. Thankfully, this can be treated successfully when given a selenium injection at birth or shortly after. And post treatment those affected can regain their strength in 3 to 5 days. All supplementation with selenium should also have vitamin E included.

What I wanted to discuss today are the other impacts low selenium can have on animal health. Low levels of selenium can also lead to low immune status. Selenium has been linked to many other diseases and can exacerbate them. There have been a few studies over the recent years done in our area.

The first one found that animals that received a selenium and vitamin E injection at birth instead of a placebo injection had less cases of rotavirus diarrhea. They also had much higher levels of selenium in their blood.

Another study enrolled Holstein bull calves between the ages of 3-10 days when they arrived at a veal facility. Some received no selenium or vitamin E, 3 groups received varying amounts of oral organic selenium or sodium selenite and vitamin E and the last group received 1ml of injectable selenium and vitamin E. They only received the treatment once on arrival. They assessed them daily, weighed them weekly and recorded treatments throughout the first 77 days of the study. They found that only those that receiving the injection had all the following beneficial outcomes:

- decreased rates of scours
- decreased time of high respiratory scores
- improved average daily gain for all 77 days

The oral groups did see some improvements but not in all three categories above.

The next used many calves at veal facilities. They were observed over 4 weeks. They either received 1ml of selenium and vitamin E injection or no treatment at all. When compared to the control group, the treatment group had 18% less pneumonia and 15% less scours. They also found a reduction of 46% in mortality.

And finally, this past fall, a study was done in Ontario beef herds that showed that only 5.4% of cows had normal blood levels of selenium and 84.4% of cows were considered seriously deficient.

The takeaway of this topic is that selenium can affect calves in other ways than just white muscle disease. We can see it in higher likelihood of catching pneumonia, having scours or even a higher chance of dying if we don't take action to prevent selenium deficiency.

Living in Ontario many dairy herds maintain high levels of selenium in their dry cow ration +/- administer an injection to the dams to try to increase the amount received by the calf, as well as to assist with proper transitioning post calving. All though this does help the calf, it may not be sufficient on its own. This is only a small piece of a very complicated puzzle to help maintain a calf's health that include ventilation, cleanliness, vaccination, etc.

If you have any follow-up questions about white muscle disease or selenium supplementation, please reach out to your herd health vet. We'd all be happy to discuss it further!

I've had a wonderful time getting to know you all over the past 5 years. Take care and until we meet again!

Elisabeth Begley DVM

Fly Control

Have you heard the buzz? Large animal technicians are now offering fly prevention in combination with dehorning services. Ask your large animal tech for more information!



Upcoming stat holidays

The clinic will be closed Thanksgiving Weekend October 8-10th. As always, veterinarians will be available 24-7 for emergency service. The Saturday fee schedule will remain unchanged from non-stat weekends.

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The advertisement features a hand in a blue glove holding a silver tray. On the tray is a box of Bovikal[®] and a gold gift card. The background is a warm, golden glow with a blurred image of a barn. Text on the image includes:

- Boehringer Ingelheim logo (top left)
- BOVIKALC[®] logo (top center)
- SERVING UP QUALITY CALCIUM** (center text)
- BOVIKALC[®] Veterinary Use Only - Usage varies in the feed supplement (on the box)
- LIMITED TIME OFFER!** (on the gift card)
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- Boehringer Ingelheim logo (bottom left)