Virtual Beef

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In This Issue

Evaluating fly control strategies…Horn flies are a pest that cow-calf producers grapple with every grazing season. Horn flies are blood-feeding and are not only irritating to cattle but can also cause changes in grazing patterns and reduced weight gain. In her article, OMAFRA summer student Isabella Principe describes the project she and OMAFRA Beef Cattle Specialist, James Byrne, undertook in cooperation with Algoma Community Pasture to assess and compare strategies for horn fly control on pasture.

...cover story

Assessing mineral status in Ontario beef herds…Season after season, the topic of mineral supplementation tends to be central to beef cow nutrition outreach campaigns – for good reason. Since trace minerals are critical to physiological functions, including those related to growth, health, and reproduction, effective mineral supplementation practices are important to herd productivity and profitability. A recent Bovine Ontario Animal Health Network survey took a closer look at mineral status in beef herds across Ontario and this article details the results of the study and take-aways for Ontario beef producers and their advisors.

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To creep feed, or not to creep feed…In his article “Decisions around Creep Feeding”, OMAFRA Beef Cattle Specialist James Byrne outlines some key decision-making criteria for creep feeding practices.

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A new survey on presence of digital dermatitis in Ontario feedlots…Are you a feedlot producer in Ontario? Here’s your opportunity to provide input on a growing issue on Ontario Feedlots: digital dermatitis. This article outlines the intent of a new survey launched by the Ontario Animal Health Network exploring digital dermatitis on Ontario feedlots and includes the link to participate.

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Direct general questions and suggestions to: Megan Van Schaik, Editor at megan.vanschaik@ontario.ca or call 519-820-4175. For inquiries regarding content of a specific article contact the author.

Ministry of Agriculture, Food & Rural Affairs

Ontario

Benefits of feeding an oral larvicide in comparison to Fly Tags to control Horn Fly Populations on Grazing Cattle

Isabella Principe, Summer Student 2023, OMAFRA

Introduction

Figure 1. Heifers at Algoma Community Pasture

Fly control is always a hot topic for beef producers when the spring season arrives in Ontario. With the warm weather and growing green grass come pests that create concerns for beef cattle across the province. Horn flies are a common blood-feeding pest of pastured beef cattle. Horn flies cause irritation and blood loss that can lead to changes in grazing patterns and reduced weight gain. Typically, horn fly populations can range from 200-250 flies per animal and are found on the shoulder and neck region of cattle. Common visual symptoms of horn flies will include tail swishing, kicking, and flicking. A moderate horn fly population of 350 flies per animal would cause 14,000 bites per day, removing 4.14 oz. of blood per day. Often horn flies can be mistaken for face flies. Face flies persist around the face and feed on secretions from the eyes and nostrils. While there are no significant economic losses, face flies can transmit conjunctivitis (pink eye) from animal to animal.

Control:

There are many control methods commonly used by producers. From the outset, it must be stated that no one single control method is totally effective, and the best control of horn fly populations is achieved using a combination of methods. Common control methods include the use of oilers, (insecticide blended with canola or light mineral oil), that use the natural desire of cattle to scratch themselves to coat their skin, pour-on products, (e.g. macrocyclic lactones), and fly tags which are impregnated with either a pyrethroid, an organophosphate or macrocyclic lactone. Less commonly used are dust bags (similar in operation to oilers) and in-feed oral larvicide such as Methoprene. Unlike the previous control methods mentioned that kill adult flies directly, an oral larvicide helps control fly populations by disrupting larval development in the manure. To be effective, an oral larvicide should ideally be fed from the start of the grazing season prior to development of significant fly populations. For pasture-based cattle, oral larvicides are usually added to a mineral premix. If horn fly populations are already established prior to starting to feed an oral larvicide, the population must be controlled with one of the other methods described above.

Objectives

The objective of this trial was to investigate the farm management impact and economics of using traditional fly tags versus a mineral premix containing an oral larvicide, Methoprene. This trial was not designed to test the effectiveness of each product to control horn fly as each product has been shown to be very effective when used correctly.

Both fly control methods have their pros and cons. Fly tags are very effective at controlling horn flies if tags are placed in both ears (2 per animal) and the tags are replaced after 60 days of use. After about 60 days the effective dose of the active ingredient in the tags is exhausted. By not removing tags at this stage, horn flies are getting a low ineffective dose of the active ingredient, which does not kill them but promotes the development of resistance. Fly tags must also be rotated to a different active ingredient each year to reduce the risk of resistance. The proper use of fly tags involves buying sufficient tags, handling cattle at least twice over the grazing season and good record keeping.

An oral larvicide has the advantage of being fed through a mineral premix. In most cases, the oral larvicide can be purchased premixed into the mineral premix at the correct rate. The challenge with an oral larvicide is that all cattle in the herd must consume the correct amount of the mineral premix daily to ensure an effective dose of the oral larvicide is delivered. As this control method does not kill adults directly, it will not prevent horn flies from migrating from one area to the other. Under and over consumption of mineral must be controlled by using salt, the amount of which varies depending on the ingredients in the mineral premix. Over consumption is not a health risk but is uneconomic.

Methods

The trial was started on May 31st, 2023, at Algoma Community Pasture, Thessalon, Ontario with two groups, one steer group and one heifer group, each with 69 animals. The steer group was fed a mineral premix containing Methoprene at a rate of 25g per 100kg body weight. Cattle in the heifer group were provided with fly tags and were fed the exact same mineral premix minus Methoprene at a rate of 25g per 100kg of body weight.

The steers weighed an average of 310 kgs (680 lbs.) and the heifers weighed an average of 286 kgs (630 lbs). After some trial and error, a ratio of 60:40 mineral to salt was determined to control mineral intake. One mineral feeder was provided to each group and placed close to areas the cattle congregated (i.e. near water and shaded areas). Each group was provided with 7 days' worth of the salt + mineral premix. At the start of each 7-day feeding period, the amount, of mineral remaining in the mineral feeder, if any, was weighed with a hanging scale (Outmate 660lb/300kg Digital Crane Scale). The amount of mineral premix to be fed was adjusted based on the weight of mineral remaining in the mineral feeder.

At the start of the 7-day feeding period, each steer received 543 grams of mineral + Methoprene premix plus 362 grams of loose salt. Each heifers received 500 grams of mineral premix and 334 grams of loose salt.

To keep track of progress, bi-weekly photographs were taken to examine for the presence of horn flies.

Results

As expected, no horn flies were observed on either the Methoprene steer group or the heifer fly tag group. A small number of face flies were observed on both groups. The biggest concern at the start of the trial was under consumption of the Methoprene mineral premix by the steer group. The opposite situation turned out to be the issue. The mineral premix used in this trial for both groups had generous amounts of distiller's grains, dry molasses, wheat middlings and crystal feed toffee as feed enhancers. At the start of the feeding trial both groups of cattle overconsumed the mineral premix necessitating the need for additional salt in the premix.

Figure 2. Steers at Algoma Community Pasture

The trial showed that both treatments are effective at controlling horn fly. At the time of writing the cattle are still grazing at Algoma Community Pasture. The issue to be resolved at the end of grazing season is whether one treatment is best for management versus the other. This will be resolved through conversations with the pasture manager at Algoma Community Pasture. An economic analysis will be conducted after the cattle leave the pasture.

Conclusion

Fly control is an important aspect of achieving good productive performance from grazing cattle. To ensure proper productivity in beef cattle herds, maintaining and preventing emerging horn fly populations is an important on-farm routine that should be adapted in all farms in the early spring months. An oral larvacide and traditional fly tags are both successful methods of horn fly control for cattle. The purpose of this trial was to determine which fly control method is the most adaptable from a farm management perspective. Overall, both methods control and prevent horn flies from emerging and in the end.

I would like to thank Algoma Community Pasture for their assistance and dedication with this project. Without their assistance, this project would not have been possible.

I would also like to thank James Byrne, OMAFRA Beef Cattle Specialist and Chad Mader, OMAFRA Beef Cattle Specialist for their help and guidance in delivering this project.

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Isabella Principe, Summer Student 2023, James Byrne, Beef Cattle Specialist
Ontario Ministry of Agriculture, Food & Rural Affairs
James.Byrne@ontario.ca

---------- VB ----------

Trace mineral monitoring in beef cattle herds

Cynthia Miltenburg, Lead Veterinarian, OMAFRA
Tanya Rossi, University of Guelph
Ray Reynen, Merck Animal Health
Jessica Gordon, Michigan State University

On behalf of the Bovine Ontario Animal Health Network

Background

Trace minerals play an important role in cattle health, growth, immune function, and productivity. Supply of trace minerals to beef cattle can vary with soil type, pasture, forages and feedstuffs, supplementation formulations, and dry matter intake; and requirements vary with cattle age and production stage. Poor reproductive performance, reduced calf immunity, elevated calf morbidity, and reduced weight gain have been associated with trace mineral deficiency in cattle. Ontario is recognized as having selenium deficient soils making selenium deficiency in cattle common. Other conditions of interest include the risk for elevated molybdenum that binds copper, and the risk for calves to be born shortened in stature with congenital abnormalities of the legs or joints associated with manganese deficiency.

It is often impossible to directly measure trace mineral status in diets due to difficulties determining the dietary composition and the amount consumed, such as with pasture feeding. Blood samples can be utilized to directly measure the trace mineral status of cattle and are more practical. Although useful for monitoring, the cost of testing and ease of collecting samples means sampling a proportion of the herd typically only occurs during periods of poor health or performance.

Objectives

The objectives of the project were to:

- To determine mineral status of a selection of cows within beef herds across the province and assess risk for trace mineral disorders
- To provide veterinarians with the opportunity to assess mineral status in individual beef herds of interest and return findings to their producer to mitigate risk for trace mineral disorders
- To better understand mineral supplementation strategies employed by beef producers

Part 1 – Blood Sampling and Results

From October to December 2021, any Ontario veterinarian could enroll a herd into the project by submitting blood samples from 10 random mature beef cows to the Animal Health Lab (AHL). A project submission form collected information on the general herd characteristics, current supplementation strategies, and recent pregnancy diagnosis outcomes. All samples submitted were tested using the AHL trace mineral panel which included manganese, iron, cobalt, copper, zinc, selenium, and molybdenum. Results were returned to the veterinarian for use by the herd.

A total of 69 herds were enrolled in the project. The average number of cows was 44 (range 11-475) and the average number of heifers in the cow-calf herd was 10 (range 0-160). Herds were spread out across the province and included 15 in Southern Ontario, 23 in Western Ontario, 7 in Central Ontario, 17 in Eastern Ontario, and 7 in Northern Ontario (See Figure 1).

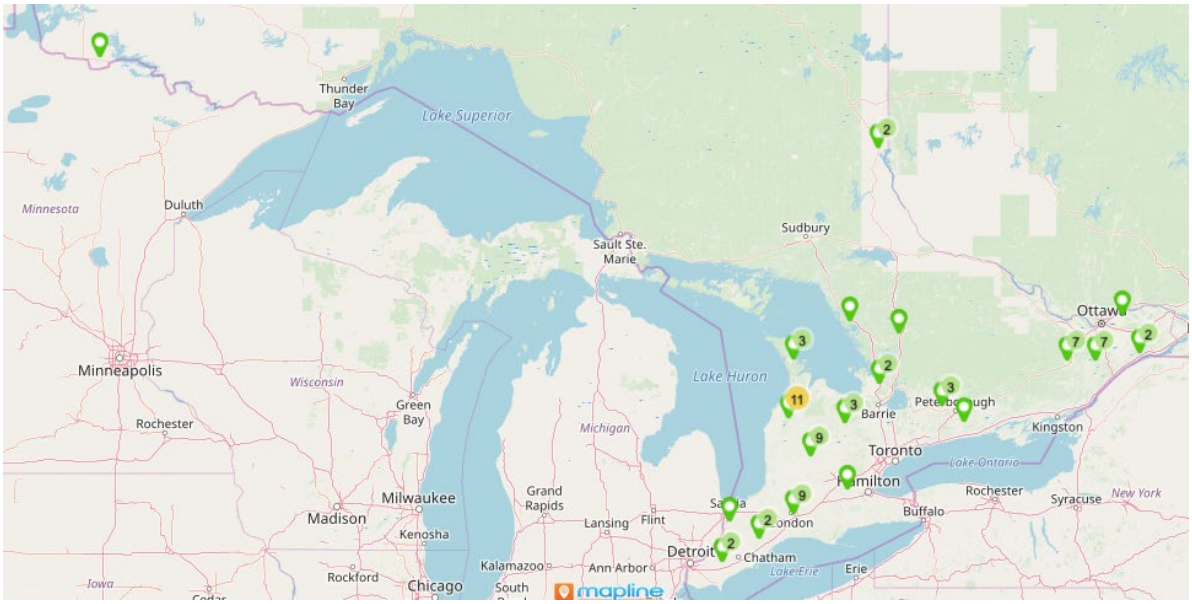

Figure 1: Map showing locations and number of participating farms by county.

All herds reported providing some form of mineral supplementation prebreeding, 95.6% of producers fed mineral at breeding and postbreeding, and 94.2% through gestation and precalving. Most producers reported using free choice mineral provision (n=59), and to a lesser extent mixed in a total mixed ration (n=10), mineral blocks (n=11), lick tubs (n=8), and injectable (n=2). Pregnancy success reported in cows averaged 94.4% and in heifers 91.7%.

The distribution of blood results is provided in Figure 2. The most significant abnormalities noted included 53% of samples for selenium being less than adequate (<0.08 ug/mL) and 43% deficient (<0.04 ug/mL), 49% of samples with elevated iron (>1.0 ug/mL), 32% of samples less than adequate for copper (<0.06 ug/mL) and 2.3% deficient for copper (≤0.03ug/mL), and 32% of samples elevated for molybdenum (<30ng/mL) and 22% of samples very high (>100ng/mL).

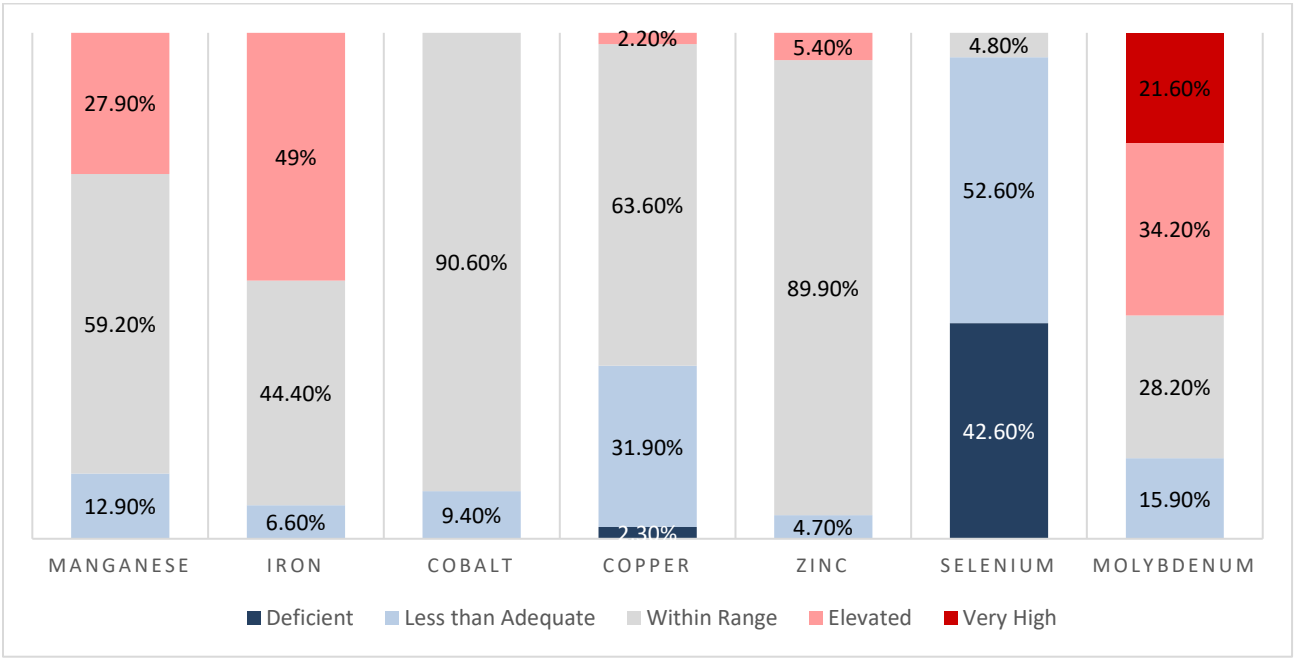

Figure 2: Summary of serum trace mineral results from 684 mature beef cows in Ontario

Many herds experienced several mineral abnormalities and mineral abnormalities tended to cluster in herds. Frequently all cows tested within a herd were low for selenium or high molybdenum. Because all herds were supplementing at one stage and the majority were supplementing at all stages, comments on the effect of supplementation on mineral status cannot be made.

Part 2 Survey of Management Practices

In December 2022, a follow up survey was sent to the producer that had participated in the project inquiring about current or changed mineral feeding practices as a result of the blood sampling results and the results of the 2022 calving season. Feeding practices described indicated 49% of producers had tested forages for nutritional value in the last year and 31% had a ration balanced by a nutritionist. Most producers used bagged mineral (75%) and 68% indicated it was placed within 10m or directly beside the water source, while 32% indicated they were more than 10m apart.

Results of the calving season reported 49% had experienced one or more stillborn calf (range 1-17% of calves), 60% had at least one weak born calf (range 1-6%), and 31% had at least one or more mortalities before 30 days of age (range 1-15% of calves). Only 2 herds indicated they had calves born with skeletal abnormalities or a shrunken stature (total or 3 calves in 2 herds). Other management practices described included 78% of herds vaccinated dams for neonatal diarrhea pathogens, 78% of herds gave selenium injections at birth to calves, and 61% of herds provided supplementary colostrum to a portion of calves as needed.

Using a retrospective approach to verify mineral fed, producers reported the amount of mineral fed/month, the weight per bag, the number of cows fed, and a mineral analysis from the product. Fifteen herds provided sufficient data to calculate the trace mineral supplementation rates in their herd. The mineral feeding rate ranged from 21 to 164 grams/head/day with a median of 75 grams/head/day. Three out of 15 herds fed sufficient selenium for a late gestation pregnant, average sized beef cow. Assuming a quarter of requirements are supplied by forage in the diet, projections for other minerals including copper, manganese, and zinc indicated 7, 3, and 5 herds supplied sufficient Cu, Mn, and Zn, respectively.

Discussion and Summary

Herds in the present study were more likely to offer mineral supplementation than in previous studies. Enrollment through the herd's veterinarian means that herds were likely biased towards working with a veterinarian and other advisors, were willing to share their information knowing that a mineral feeding strategy was in place already and had an interest to monitor the farm's current supplementation practices. Free choice supplement was a popular strategy among the herds enrolled. Many animals had abnormal trace mineral values, however the clinical significance of this is unknown. The most common abnormalities were high iron, low copper, low selenium and high molybdenum. Trace mineral abnormalities tended to cluster in herds and in individual animals Pregnancy outcomes met targets for most herds enrolled and a small number of herds that completed the follow up survey reported deformed calves, stillbirths, weak born calves, or neonatal mortality. Where mineral delivery and product information was provided, many herds were under-delivering mineral.

Analysis of blood serum for trace mineral status is useful when liver samples cannot be accessed. A knowledge of individual serum reference ranges including the effects of physiologic state such as pregnancy and lactation is necessary to interpret results accurately. Most serum values reflect recent mineral supplementation, but there are exceptions such as copper. Taking samples from a proportion of the herd, in most cases at least 10 animals, reduces effects of random variation and gives an accurate herd picture.

Best management practices to ensure trace mineral status is optimized include consulting with a nutritionist and the herd veterinarian to ensure that an appropriate mineral product is provided for the region and type of cattle, consulting product labels to provide at the recommended feeding rate and for the number of cattle in the group, and providing in a location that is clean, and desirable for cattle to access. Keeping records including birth, health, treatment, and pregnancy diagnosis records will help identify issues where performance is not meeting targets. Herd status can be monitored and should include at least 10-15 samples to get an accurate herd picture.

The Bovine Ontario Animal Health Network is a group of veterinarians and specialists working in government, university research and laboratory, and in beef, dairy, and veal practice who meet regularly to monitor and discuss disease trends in Ontario. Our goals are to facilitate coordinated preparedness, early detection, and response to animal health and welfare in Ontario. For our recent reports, projects, or more information visit www.oahn.ca.

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Cynthia Miltenburg, Lead Veterinarian, Animal Health and Welfare
Ontario Ministry of Agriculture, Food & Rural Affairs
cynthia.miltenburg@ontario.ca

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Decisions around Creep Feeding

James Byrne, Beef Cattle Specialist, OMAFRA

Creep feeding is that annual should I, shouldn't I decision that cow calf producers with spring born calves must make. Just because creep feeding last year was the correct decision, doesn't necessarily mean it's the correct decision this year. Each year must be evaluated on its own merits. Producers must make decisions for their own enterprise and their own set of circumstances as what works for the producer next door may not work for you.

Creep feeding is simply a management tool that enables calves to access supplemental nutrition, either as grain, protein supplements, commercial calf creeps, or high-quality forages while still suckling on the cow. Creep feeding enables calves to reach specific target weights prior to weaning. Other advantages include meeting specific sale requirements (i.e. at special calf sales), conditioning the rumen to the presence of starchy grains, training calves to bunk feed, enabling easier weaning by easing the cow calf bond and reducing stress at weaning. These additional advantages are sometimes more valuable than the increased return from increased gain.

Decisions around to creep feed or not is complex and depends on several factors including expected calf prices at the time of sale, the effect of added weight and condition (fleshiness) on calf prices locally, feed prices. forage availability, forage quality, conversion efficiencies of creep feeds to added weaning weight, length of time calves will be creep fed and plans for retained ownership post weaning.

The biological response to creep feed is well understood but the economic response to creep feed is also significant to cow-calf producers as this determines if creep, even in the presence of a known production response, should be fed. The economic response to creep feed depends on the cost of creep, feed efficiency and the potential market price for those calves at the target sale weight at the time of sale. The economics of creep feeding improve as the price of calves increases.

Table 1. Sample calculation to assess the effect of no creep feeding versus creep feeding on price received.

	No Creep	Creep
Weaning Weight (lbs)	500	550
Amount of creep fed (lbs/calf)	0	300
Calf Price ($/lbs)	$3.80	$3.16
Calf Value ($)	$1,900	$2,090
Cost of Creep @ $0.30/lb ($/calf)	-	$180
Profit/Loss from creep feeding v no creep feeding ($)	-	$10.00

In the example above, feeding creep versus no creep resulted in a profit over the cost of feeding of $10. In this example we have assumed a feed conversion efficiency of 1 pound of gain for 12 pounds of grain. However, feed conversion efficiency from grains can vary widely ranging from 5:1 to 30:1. Given the current high cost of creep, a high feed conversion efficiency is needed to ensure returns are greater than the cost of gain. Even then, any increase in the cost of creep can turn a modest profit into a loss. In most on-farm situations, creep feeding is not economical, but still necessary as the other benefits (bunk training, lower stress at weaning etc.) out-weight any direct feeding costs.

Consideration of the difference between current average daily gain without creep and the potential increase in average daily gain with creep is critical to determine the true economic response to creep. If the difference between average daily gain without creep and the average daily gain with creep is small, the feeding of creep is unlikely to be profitable unless

the cost of the creep feed is low. In this circumstance the feeding of a small amount of grain is beneficial for bunk training and to help reduce the stress of weaning.

Feeding programs that alter the growth rates of animals in one phase of growth often influence the subsequent phase of growth. Calves placed into feedlot backgrounding programs in good condition that have been effectively creep-fed eat more feed and gain faster during the first month due to the familiarity to solid feed and feeding bunks. In an Ontario Calf Buyers Questionnaire 2018 (Van Schaik & Chaffe, 2019) feedlot buyers indicated their preference for bunk trained calves over non bunk trained calves, but this must not come at the cost of over conditioned calves.

Overfeeding calves creep feed can lead to the production of heavy, fleshy calves. Buyers typically discount fleshy calves because the plane of nutrition these creep-fed calves have received up to this point is usually greater than the plane of nutrition the calves will be placed on in a backgrounding program. In the feedlot, over-conditioned calves grow slower, are less feed efficient, and cost more to finish compared to calves in ideal condition. This can be a double blow for cow-calf producers selling over-conditioned calves. Sellers incur additional costs associated with creep feed, then may have take a lower price compared to those selling calves in ideal condition.

A study by Lusby et al. (1986) found that limit feeding creep feed to measured daily amounts increased animal performance, gain: feed efficiency, and profitability. Research by Moreil et al. (2017) showed that beef calves limit-fed creep feed gained 0.4 lbs per day more than control calves fed no creep, where both sets of calves grazed similar pasture. These results agree with previous studies.

Creep feeding is an important management tool to sustain calf growth rates as weaning approaches. The profitability of feeding creep is complex and is controlled by several different factors. In practice, creep feeding is rarely profitable on a simple gain perspective but creep feeding gives additional benefits including bunk training and reduced stress at weaning, which cattle purchases will pay a premium for, if creep feeding is not excessive resulting in over conditioned calves.

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James Byrne, Beef Cattle Specialist
Ontario Ministry of Agriculture, Food & Rural Affairs
James.Byrne@ontario.ca

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Ontario Animal Health Network Survey on Digital Dermatitis

The OAHN Bovine network has launched a survey to better understand the presence of digital dermatitis on Ontario feedlots and actions producers are taking for its control.

Digital dermatitis is a painful foot condition causing lameness in cattle. The disease is characterized by painful lesions on the feet. Initially, lesions are raw, red, circular ulcers with a strawberry appearance. Chronic lesions may extend up in between the claws and develop hair-like projections with a warty appearance. Other common names for digital dermatitis are strawberry foot-rot and hairy heal wart.

The questionnaire will ask about the presence of digital dermatitis on your farm and its impacts. This information is being collected and analyzed by the bovine Ontario Animal Health Network (OAHN), which is dedicated to early detection and response to emerging diseases.

All responses will be kept confidential and results from the project will only be released as a summary of all responses. The survey should take approximately 10-15 minutes to complete.

The survey can be accessed at: https://uoguelph.eu.qualtrics.com/jfe/form/SV_eEe4EF0CxnDitzo
Or via the QR code below.