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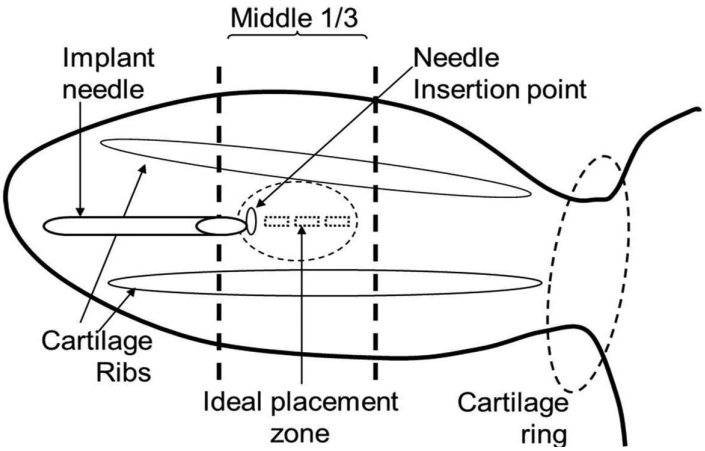
Consider using Growth Implants on this Year's Calf Crop

Growth promotants are substances that have safely been used by Canadian cattle producers for decades to promote faster growth of cattle and leaner beef. The use of growth promotants by the feedlot sector is well established, yet less than 35 per cent of Canadian cow-calf producers regularly employ this same technology. The hesitancy could be due to management and marketing strategies, consumer concerns over hormone levels in beef, or simply misinformation and confusion about the products. Whatever the case may be, the use of implants in suckling calves is worth discussing with your farm's veterinarian this year. These growth promotants are one of the most cost-effective strategies for improving weaning weights and have been reported to increase gains by four to six per cent. They have a positive effect on the environment by reducing the amount of feed and water needed to produce beef and also contribute to a reduction in the amount of greenhouse gases produced by the cattle industry.

What are implants and how do they work?

Growth implants are small, compressed pellets that are inserted between the skin and the cartilage on the middle third of the backside of the animal's ear. They are designed to release small amounts of hormones such as estradiol, testosterone and progesterone (in natural or synthetic forms) over a period of time referred to as a "payout". Most implants for suckling calves contain a lower dose of the active ingredient compared to products cleared for use in older cattle and are designed for a payout of approximately 100 to 120 days. The minimum age of the calf at time of implanting is product specific (always refer to your product label), but typically lands somewhere between 30 and 45 days.



Picture of Implant Placement sourced from: Warren Rusche. Getting Implant Application Correct. South Dakota State University Extension. Available online: Getting Implant Application Correct (sdstate.edu)

Implants partially replace the natural reproductive hormones that steers lack because of castration and accentuate those already present in heifers. They work by increasing the synthesis of muscle tissue and decrease the deposition of body fat. In general, implanted calves experience improved growth and are more feed efficient than their non-implanted counterparts. For example, heifers implanted with zeranol (Ralgro) at 60 days of age weighed 6 per cent (over 30 lbs) more at weaning than non-implanted heifers.

Are implants safe to use in replacement heifers and bulls?

Caution must be exercised when implanting potential breeding stock. Bull calves intended for breeding should never be implanted. Replacement heifers can be implanted once (they must be over one month of age) without negative impacts on future fertility.

What are some tips and techniques for optimizing an implant's effectiveness?

- Implants will not improve weight gain if nutrition is lacking. Producers must ensure growing calves have access to high quality forage and that milk production in nursing mothers is adequate.
- Choose an appropriate implant product with advice from your veterinarian and be sure to follow the manufacturer's directions carefully (read the label).
- Restrain the calf properly. This makes the job much easier and prevents injury to both animals and people.
- Use the appropriate implant gun for the implant that is being used. Ensure the needle is sharp and the gun is in good working condition.
- Be clean! Make sure the ears are free from dirt and manure. Disinfect the implant needle between animals (don't skip this step).
- Palpate the ear after you apply the implant to ensure correct placement.

Livestock Predation Prevention Options

Apron Wire and Solar Foxlights - some of the livestock predation mitigation practices you should consider implementing on your farm.

Many livestock producers are at risk of losing livestock to predation. By implementing a combination of risk mitigation practices (RMP), it can help reduce the risk of livestock being attacked by predators.

Keeping problem predators outside of your fence can be a challenging issue, as they tend to not only jump over traditional fences but dig under as well. Apron wire fence, a predator resistant fence, can be a solution to this problem. This is a high tensile, stay tuff, fixed knot fence with a predator apron. It is roughly 71 inches vertical with a 22-inch horizontal hinged apron. The apron wire fence is considered to be predator resistant as the spaces between wires near the bottom are too small for a predator to squeeze through and the apron stays flat on the ground preventing any canines from digging under the fence and getting into the pen. A pen constructed with apron wire fencing is ideal to keep livestock free of harassment by predators, protect young stock or sick animals from predators and give stock enough time to gain strength before going out on pasture.

Since it is not electrified, you will not have to worry about the fence grounding out or dealing with high water levels affecting the fence during spring melt. However, this fence requires extra strong bracing, and it can be challenging joining and tightening 16 wires. When constructing an apron wire pen, posts should be roughly 16 feet apart to provide more reinforcement and include a predator proof gate.

The gate can often be a weak point in the fence so it's important to ensure there are no gaps so predators, such as wolves or coyotes, cannot dig under or jump over. A gate constructed out of drill stem with a welded wire or concrete on the bottom prevents most predators from getting through. The apron wire fence is more costly to construct; however, it is more successful at keeping out problem predators when compared to a typical barbed wire or electric wire fence.

Another risk mitigation practice that can be used, along with the predator resistant fencing, are solar foxlights. Simply hang these solar powered lights on the fence at eye height to the canine you're trying to ward off. At night, they will flash different colours in different sequences to scare and disorient predators by giving an illusion of human activity in the area as predators are very wary and usually work in low light scenarios. It is recommended to use the foxlights at approximately one light per acre during peak risk periods for a maximum of two consecutive months, otherwise predators may become acclimatized to them. Foxlights are an effortless way to make a predator stop and consider if they want to continue into that area. However, at times hungry predators will ignore any boundaries and still pursue livestock.

Using multiple risk mitigation practices together is the best tactic to prevent predation happening on your farm. For more information on apron wire, foxlights or other mitigation practices, visit the Manitoba beef producer's website (mbbeef.ca/producers).

To watch producer testimonial videos on risk mitigation strategies that were evaluated in the Livestock Predation Prevention Pilot Project, scan the QR code.

Nutrition – Dueling Minerals – Copper and its Competitors

Beef cattle require at least 17 minerals and it is important to provide the recommended mineral requirements without over- or under-supplying them. Sometimes this is easier said than done, especially since minerals don't act independently of one another. Interactions between minerals can be very complex and may lead to mineral deficiencies. For the sake of this article let's focus specifically on the micromineral copper (Cu).

The *Canadian Cow-Calf Surveillance Network* project lead by Dr. John Campbell from the University of Saskatchewan, found that Cu deficiency is the most common trace mineral deficiency. The project gathered data from about 181 cow-calf herds from across Canada. In the western provinces, they found that 24 to 43 per cent of the beef cows tested were deficient in serum copper. This identifies a significant potential problem as a Cu deficiency may cause anemia, reduced growth, depigmentation of the hair, cardiac failure, fragile bones, diarrhea or low reproductive performance as shown by delayed or depressed return to estrus and impaired immune response in cattle (NRC 2005).

When formulating a diet, the amount of mineral needed at the tissue level must be corrected by the corresponding absorption coefficient. The absorption coefficient of copper in cattle varies greatly depending on the concentrations of the main Cu antagonists or competitors: sulphur (S) and molybdenum (Mo). The amount of these competing minerals in the feed and water should be considered when calculating Cu requirements. If less than 0.2 per cent S and less than 1.5 mg Mo/kg is present in the diet, this is considered a low level of competition from these mineral competitors. However, when high concentrations of S and Mo are present, the absorption coefficient should be corrected. For example, increasing dietary S from 0.2 per cent (requirement level) to 0.4 per cent results in a 30 to 50 per cent reduction in Cu absorption (when diets contain less than 2 mg Mo/kg DM). Therefore, if a diet contains about 0.4 per cent S (including S in the water), the dietary concentration of Cu should be increased by 1.3 to 1.5 times (Lopez-Alonso and Miranda, 2020).

Ingestion of soil when cattle are grazing will also reduce Cu absorption. If the cows are on 100 per cent pasture, twice as much Cu may be needed from what is recommended by NRC. Other minerals that also influence the absorption of Cu is a high dietary intake of zinc, iron and calcium.

Factorial estimates of dietary Cu requirements of cows given three types of diets with contrasting Cu absorbabilities (ACu)[a]

					Gross requirements (ACu) (mg/kg DM)		
	Wt, kg	Milk Yd, kg/d	Net Cu required mg/d	Feed intake, kg DM/d	Hay and Grain[b]	Green Pasture[c]	Mo Rich Pasture[d]
Cow, at 40 wks gestation	500	20	4	15.2	4.4	8.8	17.6
Cow, Lactating	63.53				69.17		59.85

[a] Approximate ACu values for different feed types are: 0.06b for roughage + concentrates; 0.03c for normal green swards; 0.015d for Mo-rich swards (>2 mg Mo/kg DM); intermediate values are needed for brown, dry season swards (0.04) and iron-rich (>800 mg Fe/kg DM) and green swards (0.02). Underwood and Suttle. 2001.

Overall, Cu requirements in cattle will range in practical conditions from 5 to 20 mg/kg DM. However, in a total mixed ration (TMR) and concentrate based diets, Cu concentrations no higher than 5 mg/kg DM have been demonstrated to be sufficient to maintain an adequate Cu status. While in situations with a large influence of Cu antagonists, Cu concentrations of 20 mg/kg DM are needed to prevent deficiency and in extreme cases up to 40 mg/kg DM (Lopez-Alonso and Miranda, 2020).

So, what does this all mean for your cow-calf herd? A good place to start is to review how much Cu your mineral supplement contains and then have your water tested for S and other minerals. Once you have these values, contact our Livestock Specialists if you have any questions or for more information.

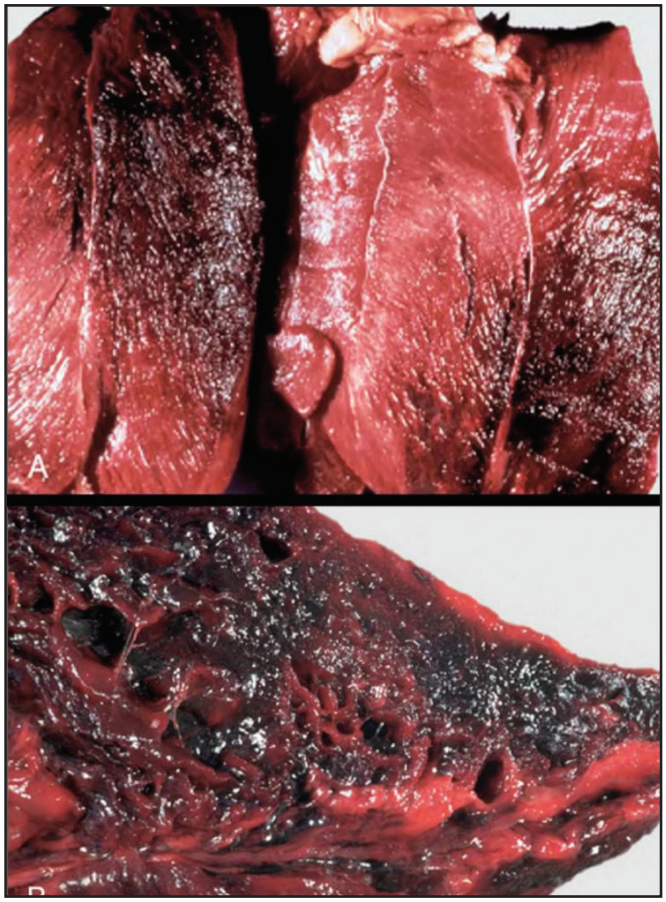
Campbell, J. 2023. The Canadian Cow-Calf Surveillance Network - BeefResearch.ca
National Research Council of The National Academies (NRC). 2005. Mineral Tolerance of Animals. Second Revised Edition, Copper Chapter 13 pp 134-153.
Lopez-Alonso, M. and Miranda, M. 2020. Copper Supplementation, A Challenge in Cattle. Animals. 10, 1890; doi:10.3390/ani10101890 www.mdpi.com/journal/animals
Underwood, E.J. and Suttle, N.F. 2001. The Mineral Nutrition of Livestock. 3rd Ed. CABI Publishing. Chapter 11. pp 283-342.

Spring Vaccinations - One of Many

Blackleg is an infectious, non-contagious disease caused by *Clostridium chauvoei* and is a common disease in cattle. Infection occurs when animals ingest anaerobic bacterial spores while grazing. It is characterized by swellings with pockets of trapped air that produce crackling over affected areas. The bacterial spores penetrate the intestine and are spread to the bloodstream to the skeletal muscle, where the spores remain dormant.

Blackleg can be associated with drought. Cattle when grazing, ingest *C. chauvoei*, a soilborne pathogen. As they graze on shorter and shorter forage, the risk of ingesting spores increases. Anything that disturbs the soil (flooding, excavation) can also precipitate infections. Following an event that causes low oxygen conditions (i.e., bruising or damage to the muscle) in infected tissue, the spores germinate, multiply and produce toxin that results in muscle necrosis and hemorrhage.

The animals affected by blackleg are usually well fed and between six months and two years of age. The cause of death in affected cattle is usually acute toxemia. The course of the disease is often between 12-48 hours and clinical signs are often absent, however, animals may exhibit signs of lameness, fever, anorexia, rumen stasis and become lethargic. Blackleg is primarily a disease of pastured cattle, with the majority of the cases occurring during the summer months.



Clostridium Chauvoei from the skeletal muscle of a cow

Photo Credit: Dr. Andy Allen I Western College of Veterinary Medicine

Ensuring that cattle are vaccinated against blackleg, and other major clostridial diseases that might occur in a particular area, will prevent the blackleg infection from occurring. Calves require two doses of blackleg vaccine, ideally one month apart, but at least in the spring and at weaning. It is desirable to give the initial two doses of vaccine before young cattle reach their most susceptible age of six months. Because all blackleg vaccines are killed or inactive vaccines rather than live vaccines, the second shot is essential to ensure the vaccine's effectiveness. First-calf heifers should receive a third vaccination for blackleg the following spring to provide the best protection. This third vaccination should provide lifelong immunity to blackleg.

The vaccine should be delivered just under the skin — not into the muscle. It's not recommended to wait until the blackleg has infected the cattle before vaccinating, as the vaccines take 10 to 14 days before they begin to provide immunity. The limited research on the vaccines suggest they are almost 100 per cent effective against blackleg contracted from the environment. The antibodies the vaccines stimulate minimize the toxic effect of any spores that become active within the animal's body. Many multivalent clostridial bacteria in seven-way vaccines are available on the commercial market for livestock producers. Blackleg vaccines protect against several clostridial diseases, including *Cl. Chauvoei* (blackleg), *Cl. Novyi* (black disease), *Cl. Septicum* (malignant edema), *Cl. Sordelli* (gas gangrene) and *Cl. perfringens* types C and D (various types of enterotoxemia). An eight-way vaccine contains an additional agent, *Cl. Haemolyticum*.

Vaccinating animals to protect against blackleg is relatively inexpensive. Most blackleg products will cost producers approximately $0.75 to $1.90 per head, plus the cost of labour, depending on the product used.

Forage Rejuvenation and Renovation

During recent dry years, the yield of older forage fields was severely impacted. Many of these fields were low in fertility and lacking legumes in the mix which contributed to the yield losses. By renovating these older fields, legumes can be reintroduced, field improvements can be made (drainage and leveling) and fertilizer can be applied, all which will help produce higher yields.

Forage establishment and selection

Successful forage production depends on the selection of species and cultivars that are adapted to site conditions and their intended end use. Forages should be selected based on their longevity, winter hardiness, drought, flood or salinity tolerance. Certain forages are better suited for hay while others are suited for pasture or both. If the forage is in the rotation for only a short period, longevity or excellent winter hardiness is less important. Soil properties and landscape should be considered, particularly if the land is subject to flooding or drought. Depending on the level of salinity, varieties may need to be salt tolerant.

If field and soil conditions are variable, a mixture of grasses and legumes is recommended, especially for pasture mixes. Include one or two non-bloating legumes such as birdsfoot trefoil, sainfoin or cicer milk vetch along with alfalfa to maximize the legume content and nitrogen fixation in pasture. Legumes in the pasture mix produce higher forage yields, quality and livestock gains. Bunch grasses are better suited for grazing but can also be used for hay.

Alfalfa is the most commonly grown legume for hay production and is very productive when well managed, capable of producing three to four cuts/year. When producing hay on a uniform field, one to two forage species can be grown but if the species winter kills or drowns out, weeds or dandelions will invade. Including a flood tolerant grass, such as timothy, in the mix will ensure a beneficial forage will grow in the low areas where the alfalfa drowns out. Meadow brome or orchard grass will complement the alfalfa on better drained areas of the field, both have excellent regrowth and will be less palatable to pocket gophers. Grass-legume mixtures will reduce bloat hazard, increase the length of the grazing and improving nitrogen availability.

Forage seeding rates

A seeding rate of ten lb/acre is recommended for forage mixtures under optimal conditions and twelve lb/acre if there are salinity or seedbed issues. Pure alfalfa sewn at eight lb/acre equates into 37 seeds per square foot, which is more than adequate. Two pounds of timothy seed/acre will provide 56 seeds per square foot compared to two pounds of meadow brome grass is under 4. Place the seeds shallow (1/4 to 1/2 inch) into a firm, cultivated seedbed or 1/4 inch deep for small-seeded forages, such as a timothy. Seed can be broadcast or planted with a drill and then harrow packed. The best time to seed forages is in the early spring, as soon as field conditions permit, as the cool, moist conditions of early spring are most favourable for the germination and growth of both grasses and legumes. Moist seedbed conditions are very important for quick establishment of the forage crop when seeding shallow. Choose quality certified seed that has a high per cent germination and vigor.

Generic glyphosates have made forage renovation much easier. Instead of having to work the sod three to four times as previously done, old forage stands can be sprayed early in the fall to kill the stand which allows the sod to break down before an annual crop and can be direct seeded in the spring. Growing at least one annual crop in between reseeding back to forages will help to break disease or insect cycles, will allow for field improvements and lessens the autotoxicity risk of old alfalfa plants on new alfalfa seedlings.

Sod & mob seeding

Direct seeding of a forage crop into an existing forage stand with either a drill or broadcasting can work but is riskier than traditional establishment into cultivated soil. For sod or broadcast seeding to be successful, the existing stand must be weakened to reduce competition for the small forage seedlings to establish. This can be done by over grazing or spraying the forage stand with glyphosate prior to seeding. Only seed legumes into an existing stand, provide phosphate fertilizer to improve establishment and seed earlier in spring to take advantage of spring moisture. Heavy grazing right after broadcast seeding will help to trample the seed into the ground and improve seed/soil contact. Timely spring rains will benefit overall establishment success.

Cover crops compete with forages for light, moisture and nutrients, reducing the survival and yield of the forages the following year. Cover crops can be beneficial by reducing weed competition and protecting the small forage seedlings from the sun, wind and desiccation. Reduce the cover crop seeding rate by half and harvest as green feed or silage to reduce competition. It is important to remove the cover crop promptly to eliminate the smothering of the forages under the swath.

Forage fertility

Forages remove significant nutrients from the soil and therefore require adequate fertility for high yields. Phosphate applied at seeding improves alfalfa establishment and root development in low and medium phosphate soils. Banding a two-to-three-year supply of phosphate at the time of seeding will ensure this valuable nutrient will be readily available for several years. Use potash fertilizer on deficient soils (most coarse textured/sandy soils) to improve alfalfa stand persistence and decrease winter kill. Be sure legumes are inoculated properly with rhizobia so they can fix their own nitrogen. If a forage stand is comprised of at least 50 per cent legume, the legumes will supply the grasses with adequate nitrogen. A three ton/acre alfalfa crop will remove 165 lb nitrogen, 39 lb phosphate, 165 lb potash and 15 lb sulphur on average/acre. Fertilizer application rates should at least replace what is being removed by the crop.

Studies have shown newer forage fields are more productive and higher yielding than older stands. MASC forage insurance coverage is higher for stands four years of age or less. If your fields are older and needing rejuvenation, now is the time to make improvements to your forage resources. By establishing new perennial forage fields, you will help ensure your forage supplies will meet your livestock requirements. Be sure to visit your local MASC office to purchase forage establishment insurance in the year of establishment.

If you would like to be added to our information-sharing list, please email or text Juanita Kopp (Juanita.Kopp@gov.mb.ca, 204-825-4302). Your input or topic ideas are always welcome.

Contact us

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