

Ergot Management & Prevention in Cattle

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Black, hard, seed-like fungal bodies that can be found in cereal grains and forage grasses is a sign of concern. This is ergot, a fungal disease that affects all cereal crops as well as many forage grass species. Ergot bodies, also called sclerotia, produce mycotoxins that are extremely harmful to both livestock and humans. Their appearance in some feed grains for cattle warrants a better understanding with how ergot affects plants and livestock as well as the best management practices around feeding contaminated grains.

Rye and triticale are particularly prone to ergot infection however barley, wheat, and oats are also susceptible. Hay crops are also capable of ergot infection. Most ergot infection occurs along field edges. It is spread from roadside or forage grasses, or from the previous year's crop. Ditches are the first source of infection since these are areas of higher moisture for sclerotia to germinate. Ergot spreads to field headlands, then towards the centre of the field, particularly if infection occurs three to four years in a row. It is less common for ergot to spread to the centre of a field of cereal crops, unless conditions are right for spread of infection.

Ergot Infection occurs in two ways. Primary infection occurs with sclerotia that dropped from previously-infected plants. These disease bodies over winter on the soil surface, then germinate in the spring. Soils must be wet during spring or in early summer to encourage germination. Mushroom-like structures grow, producing spores that spread with the wind to flowering grasses and cereals. Secondary infection occurs when these infected flowering grasses give off a sugary, sticky resin called honeydew. The resin contains spores which can spread to other plants via insects or rain drops. Wind causing flowering heads to move and rub against each other also contributes to the spread of spores. Prolonged wet, cloudy and cool weather extends the infection window and favors increases in insect populations that contribute to the transfer of spores. Honeydew eventually develops into sclerotia as plants mature.

For cattle, ergot is a major concern with the inclusion of grain in feed rations. It is also an issue in pasture, hay, greenfeed and silage. Sclerotia in grain has extremely toxic effects in cattle. Pelleted feed is also a serious risk for containing ergot alkaloids.

Two main types of poisoning that occur are convulsive ergotism and gangrenous ergotism. Convulsive ergotism, which is not common in Western Canada, results in symptoms such as nervousness, convulsions, muscle spasms of the hind legs, temporary paralysis, or even death. This form is rare in cattle, but more common in horses and sheep. Gangrenous ergotism causes swelling and tenderness of the feet, and lameness. Gangrene of ear tips and tail will also occur. If cattle continue to eat contaminated feed, dry gangrene may result where hooves slough off. This is caused by reduced blood supply and impaired circulation to extremities. This condition is more severe in cold (winter) or hot (summer) conditions where the body must regulate temperature and blood supply to extremities to counter possible cold or heat stress, respectively. It may take two weeks to three months for symptoms to develop.

The first usual sign of ergot contamination of the feed is feed refusal two to three days after introduction. This is particularly true for pelleted feed.

The threshold level for ergot alkaloids in the feed is 100 to 200 ppb (parts per billion). Ergot alkaloids at low levels (>100 ppb) will reduce rate of gain, reproductive ability, and milking ability of animals. For this reason, it is not safe to feed grain contaminated with sclerotia to young and pregnant animals.

There's a significant chance that sclerotia will not be uniformly distributed in the feed. Extensive contamination may be present in other locations within the feed. Contaminated feed must be mixed with clean feed to dilute the toxic alkaloids. The level of dilution required depends on the results obtained from a toxicology test done on the feed sample. Labs that are available that will perform mycotoxin testing on feeds include Prairie Diagnostic Services in Saskatoon, SK.

There are several management strategies to minimize the spread of ergot in hay and cereal crops. Cutting hay prior to plants reaching boot stage or before flowering will prevent the infection of flowering grasses. Grazing grasses prior to the heading stage also reduces ergot infection. Areas where cereals are highly susceptible to ergot should also be harvested as forage prior to heading. Cereals or grasses that are harvested for forage while flowering and with visible signs of honeydew still pose a risk for alkaloid toxicity. Grain should be harvested as soon as practical to catch sclerotia before they fall to the ground. Rotate crops to avoid carry-over, as ergot remains viable in the soil for one to two years.