December 2023 Toxicology Update

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The toxicology lab in Prairie Diagnostic Services provides a variety of analytical testing options related to toxicology and nutrition. The nature of requests is often influenced by economics, seasonal changes, and weather conditions such as drought. In the past several months, drought and a lack of good quality feed has been evident.

Requests for mycotoxin testing remains steady. In the past year, about 75% of clinically relevant results have been related to ergot alkaloid mycotoxins. About 25% of the results have been related to the *Fusarium* mycotoxins, primarily deoxynivalenol (also known as vomitoxin). Corn and corn silage frequently contain significant amounts of *Fusarium* toxins T-2 Toxin and HT-2 toxin. Clinical manifestations observed with many of the mycotoxins are feed refusal and reduced performance. Proactive testing by feed companies and producers have resulted in fewer disease outbreaks.

Trace mineral and vitamin status influenced by feed and water quality are frequent requests. The vitamins in cut forage samples decline rapidly over time. Winter supplementation is needed. Deficiencies will become apparent during calving season. The most common deficiency encountered related to trace minerals is copper deficiency which characterized by unthrifty animals and impaired reproduction. A common reason for submission in cases of copper deficiency include high percentage of open cattle. Cobalt deficiency is also associated with unthrifty animals and impaired reproduction. This problem appears to be becoming more common, but the manifestations are often vague at best. Prolonged consumption of poor-quality feed is a major factor. These problems will continue until adequate sources of good quality become available.

The drought conditions also stress feed sources resulting in the accumulation of nitrates in feed. Water sources may also contain nitrate concentrations that are potentially fatal. Feed testing for nitrates has increased dramatically in recent years. High nitrate feeds are observed more frequently. Livestock can develop tolerance to high nitrates over time if the feed is gradually introduced. However, tolerance is rapidly lost if animals are taken off nitrate containing feeds. Intermittent feeding of high nitrate feeds is especially dangerous.

With sustained hot weather during the summer, blue green algae poisoning in livestock is becoming a more frequent and an often unpredictable problem for livestock producers. Limited testing is available on water samples through PDS. *Dolichospermum* (formerly *Anabaena*) toxins are most frequently observed. Sudden death is the most common observation with this species.

Pesticide poisonings in general are on the decline. Regulatory approval of many agents has changed. Strychnine has now been banned, but poisonings have been detected in PDS since the ban in March. Poisonings with strychnine will likely continue for several years. Zinc phosphide has now been approved for use in many areas in Saskatchewan. Some non-target poisoning incidents have been reported. The use of insecticides such as organophosphates or carbamates has been reduced. Consequently, non-target poisonings have declined, but remain a cause of sudden death in most species.

Lead poisoning remains the most common toxicity diagnosed in cattle in PDS. Most cases are diagnosed in May and June, however cases can be seen as late as December.