

Blue Green Algae Poisoning in Western Canada

Blue green algae poisoning is often seen in western Canada during the hot summer months. The primary manifestation of poisoning is sudden death. In addition to livestock, dogs and other species are affected. In some instances there are public health implications. Poisonings are unpredictable. There is considerable year to year variation. The algae may grow rapidly in the water. The composition of the algal bloom may include many species of blue green algae such as Anabena and Microcystis. Other species plus bacteria may also be present in the water. In recent weeks, Prairie Diagnostic Services has tested many water samples associated with sudden death in livestock. Unusually high numbers of positive samples have been identified. About 75% of the positive tests have been associated with Anabena algae. The remaining cases have confirmed positive for the Microcystins. Prairie Diagnostic Services has been testing water samples for both algal species using sensitive semi-quantitative test strips. This technology may be expended to include chromatographic methods in the future.

The recent hot weather and a lack of good quality water has contributed to the large number of incidents. The growth of algae is very dynamic. Many factors such as temperature, sunlight, phosphate and nitrate content of the water influence growth. High phosphate concentrations favor the growth of toxic algae. A low nitrogen / phosphate ratio favors the growth of toxic algae. These algae are in competition with non-toxic green algae. When the growth favors the blue green algae, rapid growth and potential toxin production may occur. The presence of algae is not sufficient to confirm poisoning since the blue green algae only produce the toxins under certain conditions. To confirm a case of poisoning water samples can be collected and submitted for analysis. The samples should be collected within 24 hours of the deaths. The toxins are not stable and disappear rapidly from the water. It is advised to freeze the water before submission to prevent breakdown of the toxin. Submission of about 100 mL of water is sufficient for testing.

In most instances, the toxins cause nervous system stimulation and sudden death with few pathological changes. In the hot sun, rapid decomposition limits further compromises investigation. The Microcystins also cause liver damage which may be evident in the dead animal. Other disease such as anthrax, lead poisoning, nitrate poisoning and insecticide poisoning are also associated with sudden death and should be considered as possible causes. Once the water has been deemed toxic, drinking the water should be avoided. Since the toxin breaks down quickly, the water should return to normal within a few days. It has been suggested the time period may be up to 2 weeks depending upon temperature and environmental factors. Re-testing the water after 1-2 weeks should be considered.

To prevent problems, copper sulfate (bluestone) can be added to the water. Lime can be added to the water to increase the nitrogen/ phosphate ratio. If possible shading the water area will provide some protection. Shading a portion of a small dugout with black plastic or covering the entire dugout and pumping water to a water trough can provide a solution. Most chemical methods of control are transient or ineffective at best. There have been concerns about copper poisoning with the use of copper sulfate. For cattle the risk is low. This may not be the case with more susceptible species like sheep.

If you require further information, you may contact Dr. Barry Blakley, Veterinary Toxicologist, at 306-966-7350 or by email at barry.blakley@usask.ca