

Cyanobacteria (Blue-Green Algae) Poisoning

V-1136, August 1997

Charles L. Stoltenow, DVM

Drinking stagnant pond water during hot, dry weather can cause death in animals. This water can contain certain species of cyanobacteria (formerly known as blue green algae). Intoxication with cyanobacteria is characterized by convulsions, ataxia (in- coordination), bloody diarrhea and sudden death. Affected animals rarely range far from the water source.

At least four types of potentially poisonous cyanobacteria are known to occur in North Dakota. Toxins from these bacteria are poisonous to cattle, horses, sheep, pigs, chickens, ducks (domestic and wild), pigeons, geese, herons, songbirds, dogs, rabbits, small wild and domestic animals, and even frogs, fish and snakes. Cyanobacterial toxins are primarily neurotoxic (affect the nervous system) and hepatotoxic (affect the liver). Clinical signs in cyanobacterial poisoning include nervous derangement, staggering, tremors and severe abdominal pain. The toxins are also poisonous to humans.

Toxic cyanobacterial blooms occur because of favorable conditions including hot, sunny days and warm, nutrient-rich water. The bloom is most abundant during late summer and early autumn. Under favorable conditions, bacterial numbers multiply rapidly, doubling in one day or less. Blooms usually do not last long. Rain, heavy winds or cooler temperatures often inhibit growth or break up the bloom, mixing it into the water body within a few days. However, under continuing favorable conditions blooms may last for several weeks.

The formation of toxic blooms is unpredictable. The presence of bacteria may often be determined by a bluish tinge to the water. Concentrations of bacteria are often bluish green but may vary in color from dark green to brownish green depending on the total bacterial population. Also, not all cyanobacteria are poisonous, and the cyanobacteria which can generate poisonous toxins do not always do so.

Cyanobacteria congregate on or near the water surface. Sustained gentle winds will then concentrate the bacteria on the leeward (down wind) side of the water body. Livestock and other animals are usually poisoned when they consume water containing high concentrations of the bacteria or the toxins generated by the bacteria. Ingestion of approximately one quart of heavily contaminated water has been fatal in cattle. Concentrations lethal to livestock do not usually occur on small water bodies where there is not enough wave action to concentrate the bacteria on shore.

There are a number of ways to determine the presence of cyanobacteria. If concentrations of cyanobacteria are suspected in a water body, walk around to the leeward side of the water body. If any dead animals such as mice, muskrats, birds, snakes or fish are present, assume a poisonous condition exists.

The presence of potentially poisonous cyanobacteria may be determined by microscopic examination, but the presence of the bacteria does not mean the water is toxic. Testing the water with laboratory animals is probably the most accurate method of determining whether poisonous toxins are present. For example, if water is fed to mice as their only water source and the mice die, poisonous toxins are assumed to be present. If you suspect cyanobacteria, contact your veterinarian to determine which samples would be appropriate for your situation.

There are no known antidotes for poisoning resulting from cyanobacteria. The best solution is to be aware of conditions which spawn cyanobacterial blooms. Under those conditions, keep cattle from drinking in areas having accumulated bacterial concentrations.

If wind concentrates the bacteria on one corner of a water body, fence that corner. Force the cattle to the windward side of the water body, where the bacteria cannot concentrate. Pumping water from the center of the water body, where the bacteria are unlikely to concentrate, to a water tank is another possibility.

Drinking ponds should be constructed so that they are 20 feet wide by 80 feet long and 10 feet (water depth) deep. This decreases the surface area needed for multiplication of the cyanobacteria, maintains an adequate supply of water for the livestock, and decreases the effect of wind on the surface of the pond.

If repeated cyanobacterial blooms occur, consider treatment of the water. Copper sulfate is most commonly used. Extreme caution must be used if considering the use of copper sulfate. Use only in ponds that do not drain into other waterways or bodies, and do not consume any plants or fish which may be in the pond being treated. Copper sulfate is toxic to other plants and fish and can be detected as a residue within plants and fish.

A level of 1 part per million is usually considered the upper level of treatment. This is equivalent to 8 pounds of copper sulfate per 1,000,000 gallons of water. The copper sulfate must be spread evenly across the water surface. Placing the copper sulfate crystals in a burlap bag and towing behind a small boat until the crystals are dissolved is one method. Treatment is most effective if applied just as the bloom is forming. One treatment is usually satisfactory for two to three weeks.

V-1136, August 1997

County Commissions, North Dakota State University and U.S. Department of Agriculture cooperating. North Dakota State University does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, disability, age, status as a U.S. veteran, sexual orientation, marital status, or public assistance status. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701) 231-7708. This publication will be made available in alternative formats for people with disabilities upon request, 701 231-7881.

INFORMATION ACADEMICS RESEARCH EXTENSION PUBLICATIONS CALENDAR WEATHER DIRECTORY

[Information for Prospective Students](#)

NDSU is an equal opportunity institution

This information may be photocopied for noncommercial, educational purposes in its entirety with no changes.
Requests to use any portion of the document should be sent to NDSU.permission@ndsu.edu.
North Dakota State University Agriculture and University Extension
Dept. 7070, Morrill 7, P.O. Box 6050, Fargo, ND 58108-6050