Blue-Green Algae Toxicosis

Tips for pet owners on how to diagnose and treat blue-green algae poisoning

By Jo Marshall, CVT and Justine A. Lee, DVM, DACVECC, Associate Director of Veterinary Services

Cyanobacteria (also known as blue-green algae) are microscopic bacteria found in freshwater lakes, streams, ponds and brackish water ecosystems. They can produce toxins (such as **microcystins** and **anatoxins**) that affect people, livestock and pets that swim in and drink from the algae-contaminated water. Blue-green algae grow and colonize to form "blooms" that give the water a blue-green appearance or a "pea soup" like color. It also looks like blue or green paint on the surface of the water. Because the algae float, they may be blown by the wind into thick, concentrated mats near the shore, thus making them easily accessible to livestock, pets and people. Algal concentrations vary throughout the year, but are most abundant during periods of hot weather in mid- to late-summer months and are most likely to be found in nutrient-rich water. While *most* blue-green algae blooms do not produce toxins, it is not possible to determine the presence of toxins without testing. Thus, all blooms should be considered potentially toxic. Very small exposures, such a few mouthfuls of algae-contaminated water, may result in fatal poisoning.

Dogs that enjoy swimming and playing in lakes and ponds may be exposed to blue-green algae. Clinical signs of poisoning are dependent on the toxin involved. **Microcystins** can result in liver damage or failure. Signs of liver injury include vomiting, diarrhea, blood in stool or black, tarry stool, weakness, pale mucous membranes, jaundice, seizures, disorientation, coma, and shock. Death generally follows within days as a result of liver failure. Blood work changes include elevated in liver enzymes, a low blood sugar, a low protein, and even abnormal clotting. Aggressive, immediate treatment is necessary to help treat this quick-acting, potentially fatal poison!

Anatoxins result in neurotoxicity evidenced by excessive secretions (e.g., salivation, lacrimation, etc.), neurologic signs (including muscle tremors, muscle rigidity, paralysis, etc.), blue discoloration of the skin and mucous membranes, and difficulty breathing. Death follows within minutes to hours of exposure as a result of respiratory paralysis. Livestock that graze around affected ponds or lakes and are able to drink from them are often found dead near the water source. Treatment includes anti-seizure medication, oxygen, and aggressive care by your veterinarian.

As the prognosis for a pet surviving a toxic exposure to blue-green algae is very poor once clinical signs have occurred, immediate veterinary intervention is needed. If the exposure was recent and the pet has no clinical signs, immediate decontamination (like inducing vomiting and administering charcoal to bind any toxins in the intestines) is recommended. Bathing is recommended for all animals with dermal exposures. Protective clothing should be worn by owners who are exposed to poisoned animals (e.g., during the bathing process to remove the blue-green algae). Further care includes aggressive monitoring with symptomatic and supportive care of the critically ill patient. Unfortunately, there is no antidote for the toxins produced by blue-green algae.

Given the serious risk and the poor prognosis following small ingestions, the avoidance of all blue-green algae blooms is the best way to prevent poisoning. Ponds and lakes should be fenced off from grazing livestock during key times of the season to prevent ingestion of

contaminated water. Dogs should not be allowed access to water with visible blooms of algae. Algae blooms should be removed from backyard ponds and appropriately and safely discarded. Pet owners should be aware of the potential for public health risks. All suspect blooms should be reported to local environmental regulatory authorities.

If you suspect your pet has been poisoned, it is best to immediately take your pet to your veterinarian or an emergency veterinarian. In the event that you are unable to do that, you can contact Pet Poison Helpline at 1-800-213-6680 for initial information about the potential toxin your pet may have been exposed to. Pet Poison Helpline is a service available 24 hours, seven days a week for pet owners, veterinarians and veterinary technicians. Staff can provide treatment advice for poisoning cases of all species, including dogs, cats, birds, small mammals, large animals and exotic species. As the most cost-effective option for animal poison control care in North America, Pet Poison Helpline's fee of $35 per incident includes follow-up consultation for the duration of the poison case. You can also find additional information on poisonings at http://www.petpoisonhelpline.com/.

References:

1. Roegner A, Puschner B. In: Osweiler G, Hovda L, Brutlag A, Lee JA, eds. *Blackwell's Five-Minute Veterinary Consult Clinical Companion: Small Animal Toxicology*, 1st Ed. Iowa City: Wiley-Blackwell, 2010, pp 687-695.
2. http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/lakes/lake-water-quality/blue-green-algae-and-harmful-algal-blooms.html?menuid=&missing=0&redirect=1

Photo courtesy of Birgit Puschner, DVM, PhD, DABVT