

Cow Calf Corner Newsletter for July 4, 2011

Selk, Glenn [glenn.selk@OKSTATE.EDU]

Sent: Monday, July 04, 2011 11:01 AM

To: CCCORNER@LISTSERV.OKSTATE.EDU

COW/CALF CORNER**The Newsletter****From the Oklahoma Cooperative Extension Service****July 4, 2011****In this Issue:****As Summer Heats Up, So Do Water Toxicity Issues**

By Dave Sparks D.V.M., Oklahoma State University Food Animal Quality and Health Extension Specialist

Nitrate Toxicity After a Drought-easing Rain

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

John Adams' Famous Prediction**As Summer Heats Up, So Do Water Toxicity Issues**

By Dave Sparks D.V.M., Oklahoma State University Food Animal Quality and Health Extension Specialist,

(Edited in 2011 by Glenn Selk)

The 2011 Fourth of July Holiday brought warnings for humans about "Blue-green algae" in one of the large Oklahoma lakes used for recreation. Blue-green algae has often been a concern to livestock producers in late summer in Oklahoma. With the June heat wave that has caused water temperatures to warm sooner than usual, cattle producers need to now be aware of the potential problem. Blue-green algae in dirty and drying ponds and flood overflow areas can cause fatal toxicity in all domestic animals that drink from these ponds.

The culprit is not really an algae and may not even be blue-green. The problem is caused by a group of organisms known as cyanobacteria, or bacteria with photosynthesis capability. The colors range from blue to bright green but may also be red or purple. Often these organisms will show up like a paint scum on the surface of the water.

When these organisms are present in small to moderate numbers they don't present a problem. When the pond "blooms", however, they create toxins. Blooms occur when the right conditions are met, including warm water temperatures and the presence of large quantities of nutrients, especially nitrogen and phosphorous. Water temperature goes up as water volume goes down, due to consumption and dehydration. Water temperature also rises as air temperatures go up. Water temperature goes up much

quicker and higher in shallow, stagnant sources. Water temperature goes up higher in bodies of water that have bare ground around them than in ponds that have grass and weeds up to the water. Nutrient levels in ponds rise due to fertilizer or manure run-off. Cattle spend more time standing in ponds as the air temperature increases. When cattle are allowed into the water, their urination and defecation contribute as a major source of nitrogen and phosphorous. Cattle grazing fescue pastures in the summer may also spend more time in the water because the endophyte on the fescue causes the cattle's body temperature to rise above normal. The result from the higher temperature and nutrient availability is that the pond blooms and the water goes from relatively clear to looking like green paint in just a few days due to the production of millions of bacterial bodies.

There are two toxins produced. The first is a neurotoxin that affects the central nervous system and causes very rapid death to the animal. Dead cattle are often found lying at or near the pond where they drank. Deaths can occur in large numbers if the concentration of toxin is high. The second toxin is a hepatotoxin, or toxin that attacks the liver. This results in slower death and signs include jaundice and severe sun-burning. It is not as common as the sudden death syndrome. Once the animals have consumed the toxic water, there is no treatment. Often the wind pushes the organisms and the resulting toxins across the pond where they become concentrated. An early warning sign is the presence of dead mice, snakes, or other small animals on the downwind side of the pond.

When you have a suspicious water source you should collect a sample of water, preferable from the downwind side. If it looks clear there is very little chance of a toxicity problem. Only a relatively few organisms found in water cause toxicity, so if your sample is colored or murky, it should be sent to a veterinary diagnostic laboratory for examination. Your veterinarian or county extension educator can help you submit the sample. If in doubt, keep livestock away from the pond until you have an answer.

In the past ponds have been treated with copper sulfate to kill the organisms. This practice is, however, somewhat controversial. Livestock must be kept from treated ponds for two weeks because the chemical can also be toxic, and in this time usually the bloom is over and the water is safe anyway. Some toxicologists feel that when the bloom is killed by chemicals, more toxins are released. If sampling reveals that your pond is a potential danger, consider keeping all livestock off for two weeks and then retesting. The guidance of your local veterinarian is the best help in planning a course of action.

In summary blue-green algae may be a problem when ponds bloom. There is no treatment for poisoned animals. The problem can be at least partially prevented by avoiding fertilizer run-off, keeping animals out of ponds, submitting samples of questionable water, and providing alternative water sources when ponds are blooming.

Nitrate Toxicity After a Drought-easing Rain

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

Oklahoma summers often bring "high pressure domes" that cause 100+ degree days and no rain. The resulting heat stress can cause nitrate accumulation in summer annual forage crops. Producers are very cautious about cutting or grazing the drought-stressed forages and for good reason. However, when the first drought-easing thunderstorm comes along, cattlemen are anxious to cut the forage or turn in the cattle on the field that has just received rain.

This practice can lead to a potentially dangerous situation. As the plant starts to grow and turn green once again, the nitrate uptake is accelerated. Plant enzymes (such as nitrate reductase) are still not present in great enough quantities or active enough to convert the nitrate to plant proteins. Therefore the plant nitrate concentrations become even greater in the first few days after the first rain.

Producers should exercise caution and test forages before cutting or grazing shortly after a drought-easing shower. Some of the greatest concentrations of nitrate in forages will be recorded at this time. Usually by 7 – 10 days after a “good” rain, plant metabolism returns to normal and nitrate accumulations begin to decrease. Be sure to test the forage before cutting and storing a large quantity of potentially poisonous hay.

John Adams’ Famous Prediction

The Continental Congress voted to accept the Document called the Declaration of Independence on July 2, 1776. The first “founding fathers” signed the document on July 4, 1776. (The total of 52 signers of the Declaration of Independence did not finish signing until sometime in August of that year.) One of first to sign was John Adams, the eventual second President of the United States. He was so certain that the day of the “vote” would go down in history that he wrote to his wife Abigail:

“The second day of July, 1776, will be the most memorable epocha in the history of America. I am apt to believe it will be celebrated by succeeding generations as the great anniversary festival. It ought to be commemorated as the day of deliverance, by solemn acts of devotion to God Almighty. It ought to be solemnized with pomp and parade, with shows, games, sports, guns, bells, bonfires, and illuminations, from one end of this continent to the other, from this time forward forevermore.”

John Adams was only “off” by two days! Nonetheless, we must be forever grateful to 51 others and him for putting their lives, their property, and their sacred honor on the line in the hot summer of 1776. Happy Fourth of July!

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, sex, age, religion, disability, or status as a veteran in any of its policies, practices or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services. References within this publication to any specific commercial product, process, or service by trade name, trademark, service mark, manufacturer, or otherwise does not constitute or imply endorsement by Oklahoma Cooperative Extension Service.