University Extension
UNIVERSITY OF MISSOURI COLUMBIA

Drought Information

College of Agriculture
Extension and Agricultural Information, 1-98 Agriculture Bldg., Columbia, Mo. 65211, (314) 882-8237

July 11, 1989

A testing program

Safety of alternate sources of livestock water

George Garner, Department of Animal Sciences
George Rottinghaus, Veterinary Medical Diagnostic Laboratory

This is a companion paper to Water Quality: An Often Overlooked Factor During Dry Weather by Barry Steevens, July 5th, 1989.

From our experience in the 1954 and later droughts, the nitrate/nitrite levels in Steeven's Table 2, are too high when animals are consuming significant nitrate (quarter than 0.5%) in their ration. Public Health figures for human consumption are 45 ppm nitrate (10ppm Nitrate Nitrogen) and only 0.1 ppm Nitrite.

We should be concerned about 100 ppm Nitrate in a water source. At this level, one can assume contamination of the water source either by surface runoff due to faulty well construction, or by ground water contamination due to leaching from an old feedlot site or old homestead barn site.

Natural leaching of nitrate is seasonal; highs are expected in March-April and to some extent in October-November. Rainfall amounts and vegetation needs account for this fluctuation. Nitrate/Nitrite in ponds is caused by contamination due to livestock (feces/urine) and fertilizer runoff. Excessive algae and other floating water plants are indicators of excessive nitrogen. The diphenylamine/H_2SO_4 test can be used for a quick check of nitrate. However, it will give a higher reading if nitrite is present.

New Testing Approach

The public has been sensitized to pollution in general, and when water supplies are in short supply, that concern is heightened. Simple concentration caused by evaporation, stagnation of streams, concentrated ground water and decaying vegetation (algae) may result in toxicity to animals. Common sense and time spent learning the history of a water source will probably be as beneficial as testing.

The Veterinary Medical Diagnostic Laboratory will provide containers (1 gallon) for samples. No other containers will be accepted for analysis. A complete quantitative test may cost upward toward $400 per sample. However, we will only be measuring levels believed to be toxic to livestock. The cost of this approach will be $25.00 per sample. Two classes of pesticides will be examined, chlorinated hydrocarbons and organic phosphates. Also included in the $25.00 charge will be a screen for toxic concentration of metallic ions and anionic ions; these are listed in Table 1.

Table 1.

METALLIC IONS	ANIONIC IONS
copper	nitrate
mercury	nitrite
lead	sulfate
cadinun	chloride
zinc	phosphate
magnesium	fluoride
potassium	
iron	
molybdenum	
sodium	

This service is temporary in response to request for such screening. We encourage the sending in of samples in proper containers, at the first week of the month to aid the laboratory in minimizing technician time.

We will be exploring with the Federal Fisheries Lab, the development of a biological assay for an extremely sensitive bioassay that should detect toxins below livestock thresholds. This would pick-up other pesticides and unknown toxins from decaying vegetation or algae blooms.

Directions for use of New Temporary Service for Testing Water:

1) Obtain special containers from Dr. George Rottinghaus (phone 314-882-5994) Veterinary Diagnostic Lab, UMC Columbia, MO 65211.

2) Follow directions enclosed with container in taking the sample. Ship or deliver within 12-24 hours. Preferably, pack in ice packs or refrigerate as much as possible to minimize chemical change.

3) Clients will be billed by the Veterinary Medical Diagnostic Lab.