



Water Requirements and Quality Issues for Cattle

Revised by Ted G. Dyer, Extension Animal Scientist - Beef Cattle

Water is the most important nutrient for cattle. It accounts for 50 to 80 percent of an animal's weight and is involved in every physiological process. Cattle must have free access to all the quality water they will consume. Without water, feed intake greatly decreases, the animal becomes dehydrated and body functions fail. Water availability and quality can become a major issue during a drought. It is important to check water sources frequently during a drought for water availability and quality.

Water Requirements

The amount of water an animal needs each day depends upon size, stage of production, condition and average daily temperature. Table 1 shows the water requirements at a daily high temperature of 90 degrees F for various classes of beef cattle. Water requirements double when temperatures increase from 50 to 95 degrees F. Cows and bulls will need 15 to 20 gallons of water per day during the summer months. Diet also affects the amount of water an animal will need every day. Cattle grazing lush growth that contains 75 percent water need much less additional water than cattle fed dry feeds or hay containing only 10 percent water.

Table 1. Daily water requirements for cattle when the daily high temperature is 90° F.

Type of Cattle	Daily Gallons required per 100 lbs. of Body Weight
Growing/Finishing Cattle	2.0
Dry Cow	1.0
Cow-Calf Pair	2.0
Bull	1.0

Factors Affecting Water Quality

During a drought, water quality declines as the concentration of pollutants increases when water evaporates and becomes stagnant. Many compounds in water can negatively affect cattle performance and health.

Dissolved solids: Water containing high levels of Total Dissolved Solids (TDS) are commonly found in wells in coastal regions, and can lower feed intake and daily gains of beef cattle. Lower gains and feed intake is not affected if the TDS level is below 3,000 ppm (parts per million); however, do not use water containing a TDS level greater than 5,000 ppm for cattle. Several studies have shown that TDS in the 4,000 to 5,000 ppm range have lowered stocker cattle gains and decreased milk production in lactating cows, causing a reduction in weaning weights.

Nitrates: Nitrates from manure and fertilizer are an increasing problem affecting water quality. During periods of drought, pond water and streams become stagnant and evaporate, resulting in higher concentrations of pollutants such as nitrates. Monitor levels of nitrates in the water. More than 300 ppm is considered unsafe, less

than 100 ppm safe and 100-300 ppm is questionable for cattle. When pasture or feed that is high in nitrates is fed, water contamination can become a serious problem. Death can occur when cattle consume water high in nitrates, but chronic toxicity is more common. Chronic toxicity causes the animal to eat less and thus have lower performance. Younger cattle are much more susceptible to nitrate poisoning. Avoid digging ponds near areas where runoff from cropland or livestock facilities may occur.

Mineral content: Other substances that cause water quality problems include sulfur, iron and manganese. These minerals decrease water intake because of foul flavors and/or odor. Another common problem is excessive levels of minerals that interfere with normal mineral absorption and lead to deficiencies. This is most common with high iron and sulfate levels that bind and prevent the absorption of copper and zinc.

Water temperature: Water temperature can also affect cattle performance. Cool water helps cattle maintain proper body temperature and leads to increased water intake. Shallow ponds or small water troughs can heat up in the summer and lead to decreased water intake. Deep ponds and groundwater pumped into large water tanks do not generally heat up enough to affect water intake.

Algae: Blue-green algae is a water quality problem usually seen in surface water that is rich in nutrients. Blue-green algae are actually bacteria that, under the right conditions, can potentially produce toxins that can kill cattle. Toxicity problems usually occur when cattle consume large amounts of the algae in the summer or early fall following a rapid bloom of algae. The best methods to control algae are to eliminate the source of nutrients entering the water, aerate the water or fence the cattle away from the pond and pump water to a tank. If the intake pipe in the pond is at least 3 feet below the surface, intake of blue green algae toxins is minimal.

Pond versus trough: Ponds are an important source of water for many cattle herds. To improve water quality in ponds, use fencing to prevent cattle gaining access, thereby reducing pond sedimentation. A pipe can be installed to run drinking water to a tank at the base of the dam. Researchers have documented a 9 percent higher weight gain in nursing calves when the drinking water for the cow-calf pairs came from a trough compared to cattle drinking directly from a pond.

Summary

Water is the most important nutrient for cattle, but providing clean water for cattle is often overlooked. Most problems will occur in the summer when pond water is contaminated with manure, dissolved solids, nitrates, algae or sulfates. Poor water quality can lead to poor performance and poor reproduction that often goes unnoticed, but that can be deadly as well. Special attention should be given to water quality during the hot summer months when most problems occur. Using the best quality of water available will contribute to the optimal production of cattle. Drinking water quality should be part of an evaluation when there is a problem with poor cattle performance. The only way to know if a problem exists is to test the water for anti-quality factors. Contact your local county Extension agent for sampling instructions and submission information.

*Original manuscript prepared by:
Johnny Rossi, Extension Animal Scientist, University of Georgia
Mel Pence, Veterinary Field Investigator*

extension.uga.edu