Ridin' Herd

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Provide plenty of clean, safe water

Drought makes you think of how important and precious water is. A primary challenge when managing cows on pasture in times of drought is water, especially if the water source is from a dugout. As the amount of water in the dugout decreases during dry conditions, components in the water concentrate. If there are contaminants or compounds in the water that could cause toxicity or decrease the drinkability of the water, these are compounded as the water level in the pond decreases. If cows are drylotted this summer and are lactating, ample amounts of clear, fresh water are critical.

How much water do cattle need?

Of all the nutrients listed for livestock, water is the most critical. The minimum requirement of water for cattle is a reflection of that needed for body growth; for fetal growth or lactation; and for that lost by excretion in urine, feces and sweat and by evaporation from the lungs and skin. Anything influencing these needs or losses will affect water needs of livestock.

The challenge is to determine just how much water needs are influenced by diet moisture content and digestive processes of feeds consumed.

Water requirements are difficult to assess. Because feeds themselves contain some water, and the oxidation of certain nutrients in feeds produces water, not all must be provided as drinking water. Feeds such as silages, green chop or pasture are usually high in moisture, while grains and dry hays are low. Feeds high in water content reduce water intake when cattle consume them. High-energy feeds produce more metabolic water compared to low-energy feeds. The challenge is to determine just how much water needs are influenced by diet moisture content and digestive processes of feeds consumed.

Water intake is mainly influenced by environmental temperature, class of livestock and weight. Water needs of the animal increase as temperature increases. Lactating cows have a greater need for water as compared to non-lactating cows. Data suggest bulls have a greater daily water requirement than non-lactating cows because bulls weigh more than cows. As feeder cattle get heavier, daily water intake increases.

A University of Georgia publication estimated water requirements for cattle in different production stages if the daily high temperature is 90º F. Their data suggest for cattle in this environmental condition, a growing animal or a lactating cow needs 2 gallons (gal.) of water per 100 pounds (lb.) of body weight. A non-lactating cow or bull needs 1 gal. of water per 100 lb. of body weight. As an example, a spring-calving cow will need close to 24 gal. of water per day for herself and another 4-10 gal. of water for her calf in this high-temperature environment.

On days with extreme heat, expect water usage to increase even further. Some of that water will come from feed and the vegetative grass they eat, but the major portion, 95% or more, will come from water provided in tanks, dugouts, etc. For the nursing calf, a portion of the daily water needs will come from the dam's milk.

Water quality

Providing clean, fresh water that is free from harmful contaminants is always a goal for the livestock producer. There can be compounds that affect water quality. Producers need to adapt management practices so they do not negatively impact water quality. Following are compounds/contaminants that seem to be most challenging for livestock water.

Salinity. Water that contains high amounts of total dissolved salts (TDS) can result in reduced performance. Cows will adapt to some salt in their water. Care must be taken if salt is used to limit intake of a feed in a free-choice supplementation management strategy.

Cattle actually prefer water that contains very small amounts of salt. Research would suggest water that contains a TDS of 5,000 parts per million (ppm) results in about a 10% reduction in performance. Guidelines suggest water that contains 3,000 ppm TDS or less is usually satisfactory for most livestock. Water that contains 5,000-7,000 ppm TDS should not be used for pregnant or lactating females.

Nitrates. Nitrates themselves are not poisonous to cattle; however, in the rumen, nitrates are converted to nitrites. Nitrites are absorbed into the bloodstream, which, in turn, converts hemoglobin to methemoglobin. Methemoglobin does not bind to oxygen, reducing the oxygen-carrying capacity of the blood.

Avoid high-nitrate water as a source for livestock. A safe level of nitrate nitrogen (NO_3N) in the water for cattle is less than 100 ppm. Water with more than 100 ppm NO_3N needs to be managed when used as a part of cattle's diets. Remember, total nitrate intake would be the sum of the nitrates contained in both the feed and water consumed.

Sulfates. Animals can become acclimated to the sulfates in water. Consider diluting high-sulfate water with low-sulfate water for newly arrived animals. The sulfate recommendation for calves is less than 500 ppm (167 ppm sulfur as sulfate). For adult cattle the recommendation is less than 1,000 ppm (333 ppm sulfur as sulfate).

Caution is required in evaluating sulfate levels in water because of interactions with copper and molybdenum and the inhibiting effect compounds such as sodium fluoride have on sulfate absorption for the digestive tract. In addition, high levels of sulfates may contribute to an increased incidence of polioencephelomalacia (PEM), a brain disorder found in cattle.

If copper deficiency problems are suspected, water sources should be analyzed for sulfates to determine if high sulfate levels are contributing to the problem. Remember, distillers' grains can be high in sulfur, and sulfur intake is the amount from the feeds and water consumed.

Blue-green algae. Stagnant water is an excellent environment to develop blue-green algae that can be toxic to cattle. The scum that you see on the inside of stock tanks is algae. Ponds seem to be the most common reservoir for blue-green algae. Toxicity is most common after rapid bloom, normally occurring in late summer when cattle have their greatest water consumption. Toxicity as a result of blue-green algae is difficult to predict.

Algae blooms can be controlled in a pond by using copper sulfate (blue stone). Be aware that a rapid die-off of algae may result in killing fish. Copper sulfate treatment may be ineffective if alkalinity of the water is less than 300 ppm. Contact your extension person for a guideline for the amount of copper sulfate to use. The best way to control blue-green algae is to eliminate the source of nutrients entering the pond.

Final thoughts

Water is the most important nutrient for cattle. Daily provide a clean supply of water for your cattle. As you think about developing grazing systems, the water system will affect grazing distribution. If you need to test the water supply that is used for cattle, contact your extension office to determine a laboratory nearest to you that will test livestock water.

Editor's Note: *"Ridin' Herd" is a monthly column written by Rick Rasby, professor of animal science at the University of Nebraska. The column focuses on beef nutrition and its effects on performance and profitability.*