Maintaining a Clean Water Trough for Cattle

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Water is one of the most important parts of cattle diets. It is essential for digestion, thermoregulation, growth, reproduction, and circulatory and nervous system functions. Adult cattle need 8 to 20 gallons of water per day, depending on size, diet, status, and weather. Research shows that unrestricted access to clean water improves feed intake and average daily weight gains, increases milk production, and decreases illness and disease. On the other hand, restricted access to water and poor water quality negatively impact cattle production and can potentially cause illness and death. Bad odor and taste from water sources contaminated with high amounts of minerals, salt, nitrogen, bacteria, algae, or manure likely will keep cattle from drinking enough water and can cause significant health risks or death. Water sources can become contaminated or polluted by livestock animals, wildlife, local hydrology, or soil and bedrock features. To keep drinking water supplies clean and consistently available for cattle, consider the available water sources, how to exclude wildlife, how cattle will access water and its location, and trough cleaning methods.

Water Sources

Water sources should be evaluated for reliability and water quality. Before initial use, the water source should be tested for nitrates, dissolved solids, salts, pH, and fecal coliform bacteria. It is important to ensure the water source is sufficient to meet the demands of livestock, especially in times of drought and warmer weather. Surface waters, including streams, ponds, lakes, and springs, have long been a popular water source for cattle producers. Wells that access groundwater sources also are used to keep cattle hydrated. When supplied to troughs, well water can be safe from the impacts of drought, muddy floodwaters, and toxic algae blooms, although regular trough cleaning is necessary (Figure 1). Wells use pumps that require a continuous supply of electric power. During a power outage, backup water sources such as streams and ponds provide insurance against water supplies running low. Keeping large tanks filled also buys time while addressing electrical failures. Municipal water supplies may provide more consistent water quality but could incur higher operational costs.

Figure 1. Troughs in corrals need more frequent cleaning.

Excluding Wildlife

Some water sources can be attractive to wildlife seeking clean water, particularly in times of drought and heat stress. Wildlife conflict is most common when using water troughs, and steps should be taken to minimize wildlife's impact on the safety of cattle drinking–water supplies. Smaller animals such as birds and rodents may get trapped in troughs and drown. These animals can pollute water from feces or urine in addition to the animal carcass and may introduce harmful pathogens such as Leptospira. These contaminants cause a decrease in cattle water intake, feed consumption, and weight gains. While it's difficult to completely exclude wildlife from accessing water sources, producers can install escape ramps (Figures 2 and 3) that provide a means for trapped animals to exit water troughs. Keeping open troughs completely empty when not in use can prevent wildlife from drowning, and empty tanks will deter wildlife activity. Closed–ball watering systems (Figure 4) are one way to prevent wildlife from disturbing cattle drinking water.

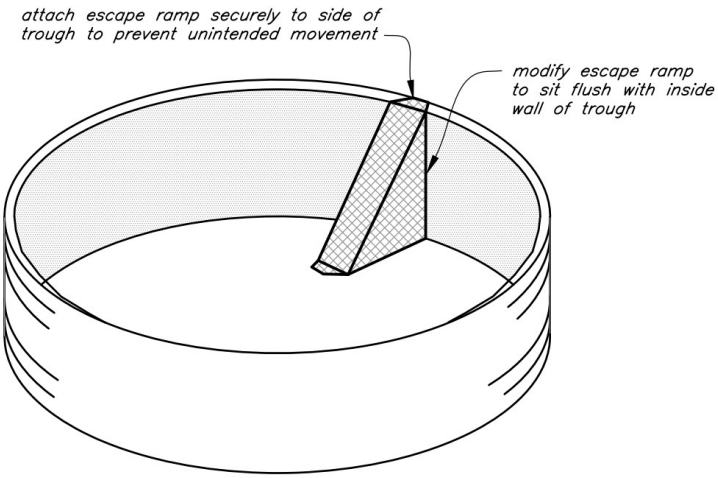

Figure 2. Diagram of a wildlife escape ramp. Source: USDA Natural Resource Conservation Service.

Figure 3. A wildlife escape ramp installed in a water tank. Photo: Kelly Melton.

Water Access and Location

Planning water access and location is essential when constructing new livestock facilities or renovating older operations. Cattle always need access to adequate clean drinking water, and a variety of water sources and locations may be required to accomplish this goal. Water troughs should be located at least 150 ft away from feeding bunks or hay feeding areas to avoid contamination from feed debris. Spreading apart the feed and water areas also increases distribution of manure throughout the pasture. Since water troughs are high–use areas, placing the trough on an elevated concrete pad can minimize fecal contamination from manure. Installing a heavy–use gravel pad around the trough also can reduce hoof damage to cattle from standing on poorly drained surfaces.

Figure 4. Closed–ball watering system.

Cattle prefer drinking water that is between 40–77 °F, and their intake declines when water temperatures rise over 80 °F. Shallow water sources and those placed in direct sunlight are more likely to heat up in hot weather and lead to decreased consumption or increased algae growth. Static trough water also will heat up more quickly than groundwater that is pumped into larger tanks that automatically refill. Placing troughs within tree–shaded areas or using closed–ball waterers also can reduce sun exposure and keep water temperature within an ideal range. Be sure to consider any overhanging vegetation that may drop leaves or other materials into open–water troughs (Figure 5).

Cleaning Methods

Water troughs are a common means of providing adequate hydration to a herd and can have positive impacts on herd performance compared to surface water sources. However, whether the water is supplied from a well or pumped from a stream, spring, or pond, water troughs easily become contaminated with sediment and bacteria. Producers should clean out physical debris regularly, and chemically disinfect troughs at least two times per year. More frequent cleaning might be required during periods of heavy use or when significant amounts of debris have accumulated. Targeted cleaning during the late spring and summer months will help keep bacteria levels down.

Figure 5. Example of an open water trough.

When checking the condition of a trough:

- Water should never be colored or murky.
- Algae mats should not fully cover the surface or container walls.
- There should be no noticeable odors, particularly those of sewage, rotten eggs, mold, or animal waste.

Such conditions can indicate dirty water and require a trough cleaning. However, not all water contamination is visible. Dissolved salts, high or low pH, minerals, and metals may not produce visible effects. Water should be tested initially to check the chemical properties of new water sources and annually for fecal coliform bacteria contamination.

To thoroughly clean a water trough:

1. Empty it completely and remove all debris.
2. Rinse the tank twice with a 10% bleach solution (1 part bleach to 9 parts water, or about 1.5 cups bleach in 1 gallon of water).
3. Let the bleach solution contact the tank surfaces for 15 min.
4. Rinse the tank twice more with clean water.
5. Refill the tank.

In addition, 8 oz of household bleach per 1,000 gallons of water can be added when refilling the tank. This results in a 3 ppm concentration of chlorine in the water, which is safe for cattle to drink and helps control algal and bacterial growth in the water. Bleach can be added again after each total volume turnover, based on the cattle's drinking rate. For example, 20 cows that drink 15 gallons per day solely from an autofilled 1,000–gallon tank would turn over the volume in 3 days. Table 1 shows typical daily water intake by beef cattle under different ambient air temperatures.

Adding bleach at a greater concentration could risk creating high chlorine contamination levels and deter cattle from drinking. Unscented regular household bleach (5–6% concentration; no highly concentrated solutions, pastes or gels) should be used for these ratios.

Table 1. Beef cattle water-intake estimates.

Daily water intake estimates (gallons) at air temperature						
	40 °F	50 °F	60 °F	70 °F	80 °F	90 °F
Weight, lb	**Growing beef calves**					
400	4	4.3	5	5.8	6.7	9.5
600	5.3	5.8	6.5	7.8	8.9	12.7
800	6.3	6.8	7.9	9.2	10.6	15
	Finishing cattle					
600	6	6.5	7.4	8.7	10	14.3
800	7.3	7.9	9.1	10.7	12.3	17.4
1,000	8.7	9.4	10.8	12.6	14.5	20.6
	Pregnant cows					
900	6.7	7.2	8.3	9.7	no data	no data
	Mature bulls					
1,400	8	8.6	9.9	11.7	13.4	19
1,600+	8.7	9.4	10.8	12.6	14.5	20.6

Note. Adapted from *Nutrient Requirements of Beef Cattle* (8th ed.) by National Academies of Sciences, Engineering, and Medicine, 2016 (https://doi.org/10.17226/19014). Copyright 2016 by the National Academies Press.

Summary

Keeping a clean trough and tank is essential for maintaining water palatability and intake, reducing disease and pathogen risk, and contributing to overall performance of cattle. Cleaning and disinfecting troughs will help maintain safe water sources for cattle regardless of any particular system design. Water testing and monitoring for potential contaminants at the water source is highly recommended. Your local University of Georgia Cooperative Extension agent can provide guidance on water testing, treating well water with chlorine bleach (i.e., shocking), and addressing other common water quality issues, such as mineral contamination and algae growth.

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