

## Water Requirements and Safety for Cattle Following a Disaster



Although cattle can survive for days without food, a supply of clean, fresh water is essential to keep animals alive following a disaster. Generally, cattle can survive for a few days without water since they store some water in their rumen. But this water will run out quickly and needs to be replaced to keep animals alive and to prevent digestive problems.

### Water Requirements

It's always best to provide free-choice water to cattle, but following a disaster, you may not be able to. Water requirements increase by at least 50 percent in lactating cattle and in hot weather.

#### Minimum Water Requirements

- Adult, nonlactating beef and dairy cattle: 10-15 gal/head/day
- Lactating cows and bulls: 20-25 gal/head/day
- Young, growing cattle (less than 500 lb): 5-10 gal/head/day

### Water Safety

Contamination of water supplies can be common following disasters, particularly following flooding of water wells. Water that is potentially contaminated with bacteria can be treated with 2 gallons of unscented liquid household chlorine bleach (5.25 percent) per 100 gallons of water. To disinfect water wells, pour 4 gallons of a chlorine bleach solution (1 gallon of household bleach and 3 gallons clean water) into the well. Open all faucets and let water run until chlorine is smelled. Then let the system sit for 24 hours. If contamination of water by toxins is possible, it should be avoided until tested.

### To Disinfect

Flooding of coastal areas caused by a hurricane storm surge can contaminate water supplies with salt. Calves are more susceptible to salt toxicity. Lactation, hot weather and exertion increase water intake and make adult animals more susceptible to salt toxicity.

Total Soluble Salts Content of Water  
(ppm = parts per million)

- Less than 3,000 ppm = safe for cattle.
- 3,000-5,000 ppm = Satisfactory, but cattle may be reluctant to drink, and it may cause diarrhea.
- 5,000-10,000 ppm = Avoid giving to pregnant or lactating cattle, old and young cattle.
- Greater than 10,000 ppm = Unsafe.

If cattle have been drinking water with dangerous levels of salt, it is best to slowly transition cattle to fresh water. Supplying small amounts frequently is best. Try to ensure that no cows are overdrinking or limiting others access to fresh water.



Conversion factors:

- 1 ppm = 1 milligram per kilogram (mg/kg) = 1 milligram per liter (mg/L)
- 1% = 10,000 ppm

### Calculating Trough Capacity

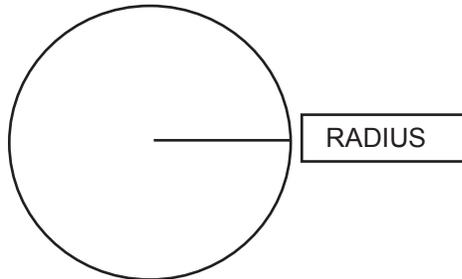
Rules of thumb for calculating necessary trough space:

- 1 gal of water = 8.3 lb
- 1 cu ft of water = 7.48 gal or 62.3 lb
- 1 gal of water = 231 cu in

Based on these figures and using some geometric equations, you can closely estimate the amount of water you are providing for livestock.

To figure how much water a trough can hold, use the following examples based on the shape of your water trough:

### Circular Trough



In this example, the radius (half the diameter) of the water trough is 48 inches and the depth of the trough is 24 inches. Use this formula:

$$\text{Circle} = \frac{\pi \times \text{radius}^2 \times \text{depth}}{231} = \text{gallons}$$

$$\text{Water trough} = \frac{3.14 \times (48 \times 48) \times 24}{231} = 751 \text{ gallons}$$

You also can calculate the amount of gallons by inch of depth in the tank. For example:

$$\frac{751 \text{ gal}}{24 \text{ in}} = 33.3 \text{ gallons per inch}$$

### Rectangular Trough



$$\text{Rectangle} = \frac{\text{length} \times \text{width} \times \text{height}}{231} = \text{gallons}$$

This rectangular water trough is 84 inches long, 36 inches wide and 24 inches deep. Thus, in this example:

$$\text{Water trough} = \frac{84 \times 36 \times 24}{231} = 314 \text{ gallons}$$

#### References:

- “Nutrient and Toxic Substances in Water for Livestock and Poultry.” National Academy of Sciences Subcommittee on Nutrient and Toxic Elements in Water, Washington, D.C., 1974
- Guyer, P.U. “Livestock Water Quality.” Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, Pub G79-467-A, 1996.
- Bagley, C.V., et al. “Analysis of Water Quality for Livestock.” Utah State University Extension, AH/Beef/28, 1997.
- “Care of Livestock and Horses in Disasters.” Federal Emergency Management Agency Publication Animals in Disasters, Module A, Unit 8.
- Griffin D. “Water Quality for Beef Cattle: A Review of Extension Publications.” University of Nebraska-Great Plains Veterinary Educational Center, 2002.

This material is based upon work supported by the Cooperative State, Research, Education and Extension Service, U.S. Department of Agriculture, under Award No. 2006-41210-03363.

#### Authors:

Christine B. Navarre, DVM, MS, DACVIM  
Extension Veterinarian,  
Department of Veterinary Science

Jason E. Rowntree, Ph.D., Extension Beef  
Specialist, Department of Animal Science.

Bill Branch, Ph.D., Professor, Department  
of Biological and Agricultural Engineering

Visit our Web site: [www.lsuagcenter.com](http://www.lsuagcenter.com)

**Louisiana State University Agricultural Center**  
William B. Richardson, Chancellor  
**Louisiana Agricultural Experiment Station**  
David J. Boethel, Vice Chancellor and Director  
**Louisiana Cooperative Extension Service**  
Paul D. Coreil, Vice Chancellor and Director  
Pub. 2949-P 7/06

Issued in furtherance of Cooperative Extension work, Acts of Congress of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. The Louisiana Cooperative Extension Service provides equal opportunities in programs and employment.