



# BEEF CATTLE



## Preparing Beef Cattle Operations for Drought

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### Introduction

Unlike natural disasters such as tornadoes, hurricanes, flash floods and fires, droughts tend to give some warning signs as conditions worsen, allowing producers some time to begin preparing for drought onset. Louisiana cattle producers rely heavily on grazed forages; thus, drought can significantly impact cattle performance, production and profitability. Decreased performance and production can be amplified when drought occurs during summer months and cattle are also faced with the threat of heat stress. Developing a management plan in advance of drought allows producers to become more resilient and mitigate the impact drought has on their operations.

### Defining Durability During Drought

Adopting best management practices throughout the year can mitigate the negative impacts of drought and other stressors on cattle performance. Operations become more durable during a drought when management plans and infrastructure considerations are made in advance. These plans may need to include some flexibility or reassessment methods as drought conditions worsen.

Drought plans should include:

- What to do if natural water sources dry up.
- How to supplement or feed cattle when forage quantity and quality diminish.
- Locations of alternate places to purchase stored forages and feed.
- Considerations of reducing stocking rates when necessary.
- What locations contain adequate shade should heat stress become a concern.

### Monitoring Drought Potential and Conditions

Drought conditions can begin within a matter of days in Louisiana. Importantly, the duration and severity of drought can be difficult to predict. Producers are encouraged to record precipitation (or lack of), temperature, soil moisture, and high and low temperatures throughout the year to assist in making short- and long-term preparations for drought.

Beneficial resources to access drought conditions and provide current drought information, future outlooks and historical data, along with drought impact by commodity or sector are:

- Louisiana State Climatology Office<sup>1</sup>
- LSU AgCenter's Louisiana Agrilimatic Information System<sup>2</sup>
- U.S. Drought Monitor<sup>3</sup>
- Drought.gov<sup>4</sup>

### Water Requirements and Sources

Quantity and quality of water become a concern during drought. Water is evidently fundamental for livestock, as it is an essential nutrient and indispensable for growth, digestion, lactation and sustaining overall metabolic processes.

Daily water requirements in beef cattle are influenced by:

- Age
- Size
- Body condition
- Physiological state (e.g., pregnancy and lactation)
- Environmental temperature

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## Water Requirements and Sources (cont.)

For example, in 90 F temperatures:

- Bulls and dry cows require 1 gallon of water per 100 pounds of body weight.
- Growing and finishing calves and cow-calf pairs require 2 gallons of water per 100 pounds of body weight.

Beef cattle daily water requirements are provided in Tables 1, 2 and 3.<sup>5</sup>

There are some additional general guidelines for water requirements to consider.

- Cattle will consume and additional 1 gallon of water per day for every 10-degree increase in daily temperature above 40 F.
- For each additional pound of milk produced by a lactating beef cow, water consumption will increase by 1 gallon.
- Providing feeds that are dryer or contain higher amounts of dry matter will result in more water being consumed than feeds with lower amounts of dry matter.

It is common for primary water sources in Louisiana pastures to consist of surface water in ponds, streams, bayous and other natural sources. Unfortunately, many or most of these may dry up during drought. Water quality may also become compromised as surface water levels decrease and sedimentation increases. Cattle frequently use surface water to cool themselves, which increases the total amount of solids (organic and inorganic materials) and decreases water quality.

Total dissolved solids (TDS), such as salt, minerals, metals and other ions, may interfere with average daily gains as increased TDS can

lead to decreased water consumption and feed intake. Likewise, elevated levels of minerals and nitrates are common in stagnant water. Elevated levels of nitrate and extended elevated levels of nitrates can lead to chronic toxicity and death of cattle. Increased mineral concentrations in water can impair an animal's normal ability to absorb minerals from the diet and subsequently lead to mineral deficiencies. If you have concerns or questions regarding the quality of water being provided, reach out to your local LSU AgCenter Extension Office for assistance with water sampling and testing.

The options for drought preparation strategies should include:

- Plans to move cattle to pastures with reliable water sources.
- Installation of additional water sources.
- Transporting water to cattle.

Try to place water troughs under or near shade sources whenever possible. Cattle decrease water consumption when the water temperature is greater than 80 F. Frequently monitor water levels and equipment throughout the year and increase the frequency of these checks during drought conditions.

Weight (pounds)	Temperature (F)					
Growing heifers, steers and bulls	40	50	60	70	80	90
400	4.0	4.3	5.0	5.8	6.7	9.5
600	5.3	5.8	6.6	7.8	8.9	12.7
800	6.3	6.8	7.9	9.2	10.6	15.0
Finishing Cattle						
600	6.0	6.5	7.4	8.7	10.0	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

*Table 1. Estimated voluntary water intake of growing and finishing cattle (gallons per day).<sup>5</sup>*

Cow body weight (pounds)	Milk production (pounds/day)	Temperature (F)		
		40	65	90
1,100	0	8.2	10.8	13.4
1,100	10	10.5	13.1	15.7
1,100	25	12.8	15.4	17.9
1,300	0	9.2	11.8	14.3
1,300	15	12.2	14.8	17.4
1,300	30	14.5	17.1	19.7
1,500	0	10.2	12.7	15.3
1,500	20	14.0	16.5	19.1
1,500	35	16.3	18.8	21.4

*Table 2. Estimated voluntary water intake of mature beef cows per day (gallons per day).<sup>5</sup>*

## Water Requirements and Sources (cont.)

Bull body weight (pounds)	Temperature (F)		
	40	60	90
1,400	8.0	9.9	19.0
1,600	8.7	10.8	20.6

*Table 3. Estimated voluntary water intake of mature beef bulls per day (gallons per day).<sup>5</sup>*



*Figure 1. A water trough is located underneath artificial shade structures. Photo by Jeff Gurie*

## Nutrient Requirements

A key benefit of raising beef cattle in Louisiana is the ability to graze cattle on quality forages seemingly year-round. However, drought can drastically reduce both quantity and quality of forages available. This includes forages available for grazing, along with forages typically used to cut and store for use throughout the year.

Several management considerations should be in place prior to the onset of drought, including:

- Having a nutrition plan for all cattle year-round.
- Taking forage samples.
- Understanding what toxicity issues become a concern during drought.
- Ensuring your operation can feed stored forages or supplemental feeds when needed.

Like water requirements, nutrient requirements for beef cattle vary based on age, size, body condition and stage of production. Average daily temperatures can impact grazing times, reduce the duration of grazing, as well as decrease feed intake. Producers are encouraged to separate cattle based on nutritional needs whenever possible. For example, thinner cattle should be grouped together to supplement them with stored forage or feed to increase body condition. Extension agents and specialists can help you determine the nutritional needs of your herd based on forages being grazed and tailor diets for each group of cattle.

Since many producers rely on grazing to meet nutritional demands, there is often a lack of infrastructure needed to store and feed additional feedstuffs to cattle. Considerations should be made ahead of drought to determine what types of feedstuffs can be stored and distributed to cattle when necessary.

There are numerous options for feed bunks to be used in pastures or in confined areas. When purchasing or manufacturing feed bunks, try to use bunks with solid bottoms to minimize waste and ensure adequate bunk space per animal.

The average bunk space needed per animal when feeding once daily is:

- 22 to 26 inches for developing heifers.
- 24 to 30 inches for mature cows weighing 1,000 to 1,300 pounds.
- 30 to 36 inches for bulls.

It is important to note that drought places stress on crops and forages. Consuming stressed crops and forages can increase the risk of toxicity issues in cattle. Poisonous plants may become more prevalent in pastures during drought. Again, producers are encouraged to work with their local extension agent to scout pastures, discuss toxicity concerns and test any forage or feedstuffs provided to their cattle.

## Shade Requirements and Sources

Although drought and extreme heat do not always occur simultaneously, it is exceedingly common for drought to occur during summer months in Louisiana when heat and humidity levels are elevated. Heat stress in beef cattle can occur acutely or chronically. Both can lead to decreased performance, impaired health and death. Importantly, heat stress

can be subclinical, meaning cattle may not exhibit symptoms of heat stress but are still significantly impacted by it.

Beef cattle are most comfortable when the average ambient temperature remains between 41 F and 77 F. However, other environmental factors such as relative humidity, solar radiation and wind velocity can influence heat stress. Temperature and

humidity parameters are used to calculate a Thermal-Humidity Index (THI), which is a score developed to estimate potential threat of heat stress. This is an essential tool and should be referenced when making management decisions. The THI levels can be interpreted according to the Livestock Weather Hazard Guide<sup>6</sup> (Figure 2).

As cattle producers prepare for the summer months, they should assess the amount of shade provided at each location where cattle are being housed.

Animal size dictates the amount of shade needed for each animal, which is:

- 15 to 20 square feet for a 400-pound calf.
- 20 to 25 square feet for an 800-pound feeder calf.
- 30 to 40 square feet for mature beef cattle.

Artificial shade structures should be provided if natural shade sources do not exist or are inadequate. Trees can be planted to provide natural shade in the future. Artificial shade structures can be portable or permanent. This depends on producer preference and what is most feasible at each location. Artificial shade structures should be at least 10 to 14 feet tall, and the direction of sunlight should be considered to provide shade during the hottest parts of the day.

Additional information on the impact of heat stress in beef cattle and ways to mitigate heat stress in beef cattle operations is provided in "Impacts of Heat Stress" by Dr. Christine Navarre.<sup>7</sup>

### Livestock Weather Hazard Guide

		Relative Humidity (%)																																																			
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100																																
Dry Bulb Temp. (F)	75									70	70	71	71	72	72	73	73	74	74	75	75																																
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	78						70	70	71	71	72	72	73	74	74	75	75	76	76	77	78	78																															
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	81									70	70	71	71	72	73	73	74	75	75	76	77	77	78	78	79	80	80	81																									
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105																													70	71	72	73	74	75	75	76	77	78	78	79	80	80	81	82	83	84	85	86	87	88	89	90	91

Alert  
Danger  
Emergency

Figure 2. Livestock Weather Hazard Guide produced by the Noble Research Institute.

Figure 3. Cattle congregate under a single shade tree in a pasture with inadequate shade for the summer months. Photo by Ashley K. Edwards



## Record Keeping

The importance of detailed records on all inventory, infrastructure, equipment and livestock cannot be overemphasized. Written lists, photos and/or videos prior to and following drought can be crucial when seeking assistance through the U.S. Department of Agriculture's Farm Service Agency (USDA-FSA) and in receiving insurance payments. Be sure to review insurance policies to know when coverage begins and what hazards your policy covers. Additionally, data on cattle performance (calving rates, weaning percentages, average daily gains, etc.) and forage production (pounds of forage produced or bales produced per location) in normal years may be referenced when seeking financial assistance following drought.

## Future Considerations

Always work to maximize and maintain herd health and nutrition throughout the year. Healthy cattle in good condition are easier to maintain than chronically ill or poorly conditioned cattle. If heat stress is a concern, cattle should be worked and/or transported during the coolest parts of the day. It may be necessary to extend cattle workings over a period of several days to avoid long hours extended in the heat.

Developing relationships with your veterinarian, local extension office, USDA-FSA office, and other producers in your area is equally important. These relationships can be beneficial when seeking help during drought or other

situations. Work with your coworkers and veterinarian to establish a plan or set of plans to reference when drought conditions begin and if they worsen. Consistently monitor weather conditions to anticipate the onset of drought and drought severity. Finally, remember to prioritize your safety and the safety of those working with you. Provide clean, cool water for yourself and workers, and try to limit manual labor to the coolest parts of the day whenever possible. Safety tips and other resources for personal and worker safety can be found at the Ready.gov Drought website<sup>8</sup> and U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA) Drought Safety Tips and Resources website.<sup>9</sup>

## References

- <sup>1</sup>Southern Climate Impacts Planning Program's Louisiana Climate Data Portal. Louisiana State University. 2024. <https://losc.climate.lsu.edu/>.
- <sup>2</sup>Louisiana Agrilimatic Information System. Louisiana State University Agricultural Center. 2024. <http://weather.lsuagcenter.com/>.
- <sup>3</sup>U.S. Drought Monitor. National Drought Mitigation Center. 2024. <https://droughtmonitor.unl.edu/>.
- <sup>4</sup>Drought.gov. National Integrated Drought Information System. 2024. <https://www.drought.gov/>.
- <sup>5</sup>Nutrient Requirements of Beef Cattle. National Research Council. 2016.
- <sup>6</sup>When It's Hot It's Hot and When It's Not, It's Still Hot. Wright, Clay. Noble Research Institute. <https://www.noble.org/regenerative-agriculture/livestock/heat-stress-in-cattle/>.
- <sup>7</sup>Impacts of Heat Stress. Navarre, Christine. Louisiana State University Agricultural Center. 2020. <https://www.lsuagcenter.com/articles/page1589212080415>.
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- <sup>9</sup>Understand Drought and Know How to Respond. U.S. Department of Commerce National Oceanic and Atmospheric Administration. 2024. <https://www.weather.gov/safety/drought>.
- <sup>10</sup>Estimating Water Requirements for Mature Beef Cows. Courtney Spencer, David Lalman, Megan Rolf, and Chris Richards. Oklahoma State University. 2017. <https://extension.okstate.edu/fact-sheets/estimating-water-requirements-for-mature-beef-cows.html>.



Pub. 3933 (online) 6/24

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