



# Texas Agricultural Extension Service

The Texas A&M University System

## Water Requirements for Beef Cattle

The water requirements of cattle are influenced by a number of physiological and environmental conditions. These include such things as the rate and composition of gain, pregnancy, lactation, physical activity, type of ration, salt and dry matter intake, and environmental temperature.

The minimum requirement of cattle for water is a reflection of that needed for body growth, for fetal growth or lactation, and of that lost by excretion in the urine, feces, or sweat or by evaporation from the lungs or skin. Anything influencing these needs or losses will influence the minimum requirement.

The amount of urine produced daily varies with such things as activity of the animal, air temperature, and water consumption, as well as with certain other factors. The antidiuretic hormone, vasopressin, controls reabsorption of water from the kidney tubules and ducts, and thus it affects urine excretion. Under conditions of restricted water intake, an animal may

concentrate its urine to some extent by reabsorbing a greater amount of water than usual. While this capacity for concentration of the urine solutes is limited, it can reduce water requirement some. When an animal consumes a diet high in protein or in salt or containing substances having a diuretic effect, the excretion of urine is increased and so is the water requirement.

The water lost in the feces depends largely on the diet and the species. For instance, substances in the diet which have a diarrhetic effect will increase water loss by this route, and cattle excrete feces of a high moisture content while sheep excrete relatively dry feces.

The amount of water lost through evaporation from the skin or lungs is not obvious to us, but it is important and in some cases it may even exceed that lost in the urine. If the environmental temperature and/or physical activity increase, water loss through

**Estimated Daily Water Intake of Cattle**

Month	Mean Temp.	Cows		Bulls	Growing Cattle <sup>2</sup>			Finishing Cattle			
		Nursing Calves <sup>1</sup>	Bred Dry Cows & Heifers		400lb.	600lb.	800lb.	600lb.	800lb.	1000lb.	1200lb.
	°F	GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL
Jan.	36	11.0	6.0	7.0	3.5	5.0	6.0	5.5	7.0	8.5	9.5
Feb.	40	11.5	6.0	8.0	4.0	5.5	6.5	6.0	7.5	9.0	10.0
Mar.	50	12.5	6.5	8.6	4.5	6.0	7.0	6.5	8.0	9.5	10.5
April	64	15.5	8.0	10.5	5.5	7.0	8.5	8.0	9.5	11.0	12.5
May	73	17.0	9.0	12.0	6.0	8.0	9.5	9.0	11.0	13.0	14.5
June	78	17.5	10.0	13.0	6.5	8.5	10.0	9.5	12.0	14.0	16.0
July	90	16.5	14.5	19.0	9.5	13.0	15.0	14.5	17.5	20.5	23.0
Aug.	88	16.5	14.0	18.0	9.0	12.0	14.0	14.0	17.0	20.0	22.5
Sept.	78	17.5	10.0	13.0	6.5	8.5	10.0	9.5	12.0	14.0	16.0
Oct.	68	16.5	8.5	11.5	5.5	7.5	9.0	8.5	10.0	12.0	14.0
Nov.	52	13.0	6.5	9.0	4.5	6.0	7.0	6.5	8.0	10.0	10.5
Dec.	38	11.0	6.0	7.5	4.0	5.0	6.0	6.0	7.0	8.5	9.5

<sup>1</sup> Cows nursing calves during first 3 to 4 months after parturition — peak milk production period.  
<sup>2</sup> Requirement will be a little less for wintering on range.

Table prepared by Paul Q. Guyer, University of Nebraska

evaporation and sweating increase.

From a practical point of view, all of these factors and their interplay make the minimum water requirement difficult to assess. And still another matter adds to this difficulty. Since feeds themselves contain some water and since the oxidation of certain nutrients in feeds produces water, not all must be provided by drinking. Feeds such as silages, green chop or pasture are usually very high in their moisture content while grains and hays are low, and high energy feeds produce much metabolic water while low energy feeds produce little. These are obvious complications in the matter of water requirements. Fasting animals or those on a low protein diet may form water from the destruction of body protein or fat, but this is of minor significance.

Water requirements have been measured in a

practical way by many investigators by determining voluntary water intake under a variety of conditions. In brief, the results of these studies imply that thirst is a result of need and that animals drink to fill this need. The need results because of an increase in the electrolyte concentration in the body fluids which activates the thirst mechanism. There is experimental evidence which supports this reasoning.

As this discussion suggests, water requirements are affected by many factors and it is impossible to list specific requirements with accuracy. However, the major influences on water intake in beef cattle on typical rations are dry matter intake, environmental temperature, and lactation, and the following table has been designed with this in mind. It is a guide only, and it must be used with considerable judgment.

This information was prepared for the Great Plains Beef Cattle Feeding Handbook by D. G. Fox and O. E. Olson, Extension Animal Nutritionist and Professor, Experiment Station Biochemistry, South Dakota State University.

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