

University of Missouri Extension

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Hot Weather Livestock Stress

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During periods of high temperatures and humidity, livestock losses can occur from hot weather stress.

Hot weather stress is particularly hazardous to closely confined livestock (those in feedlots, sorting and holding pens, trucks and rail cars). High relative humidity when the temperature is at 80 degrees or more adds to the likelihood of profit-stealing losses if necessary precautions are not taken.

Missouri livestock producers can make their livestock handling and marketing plans flexible enough to take necessary precautions to reduce or eliminate livestock hot weather stress by following the Livestock Weather Hazard Guide.

Table 1
Livestock weather hazard guide

Dry bulb temperature	Percent of relative humidity intervals																				COLOR KEY
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
75									70	70	71	71	72	72	73	73	74	74	75	75	SAFE
76							70	70	70	71	72	72	72	73	74	74	74	75	76	76	
77						70	70	71	71	72	72	73	73	74	74	75	75	76	76	77	
78					70	70	71	71	72	72	73	74	74	75	75	76	76	77	78	78	
79				70	70	71	72	72	73	73	74	74	75	75	76	77	77	78	78	79	
80			70	70	71	72	72	73	73	74	74	75	76	76	77	78	78	79	79	80	
81		70	70	71	71	72	73	73	74	75	75	76	77	77	78	78	79	80	80	81	
82		70	71	71	72	73	73	74	75	75	76	77	77	78	79	79	80	81	81	82	
83	70	71	71	72	73	73	74	75	75	76	77	78	78	79	80	80	81	82	82	83	

84	70	71	72	72	73	74	75	75	76	77	78	78	79	80	80	81	82	83	83	84	
85	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84	84	85	
86	71	72	73	74	74	75	76	77	78	78	79	80	81	81	82	83	84	84	85	86	
87	72	73	73	74	75	76	77	77	78	79	80	81	81	82	83	84	85	85	86	87	
88	72	73	74	75	76	76	77	78	79	80	81	81	82	83	84	85	85	86	87	88	DANGER
89	73	74	74	75	76	77	78	79	80	80	81	82	83	84	85	86	86	87	88	89	
90	73	74	75	76	77	78	79	79	80	81	82	83	84	85	86	87	87	88	89	90	
91	74	75	76	76	77	78	79	80	81	82	83	84	85	86	86	87	88	89	90	91	
92	74	75	76	77	78	79	80	81	82	83	84	84	85	86	87	88	89	90			
93	75	76	77	78	79	80	80	81	82	83	84	85	87	87	88	89	90				
94	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90					
95	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90						EMERGENCY
96	76	77	78	79	80	81	82	84	84	86	87	88	89	90	91						
97	77	78	79	80	81	82	83	84	85	86	87	88	90	91							
98	77	78	79	80	82	83	84	85	86	87	88	89	90								
99	78	79	80	81	82	83	84	86	87	88	88	90									
100	78	79	80	82	83	84	85	86	87	88	90	91									
105	80	82	83	84	86	87	89	90	91												

Alert livestock men will adjust ventilation and bedding to the prevailing temperatures. If livestock must be transported, vehicles should be bedded with sand, sawdust, shavings or a combination of these in the summer. Avoid the use of straw, particularly oats straw, in vehicles with solid sides or tight boxes during hot weather. Use "wet" bedding in "shirt sleeve" weather. Sprinkling animals in confined areas may be advisable when the temperature is above 80 degrees outside.

Using the Livestock Weather Guide

Obtain the current or expected temperature and relative humidity by listening to a weather forecast or read your own thermometer and hygrometer. Bear in mind what the temperature and humidity is likely to be by the time the animals reach their destination.

Locate the temperature (actual or forecast) in the column at the left of Table 1.

Follow the line to the right until you come to the "relative humidity" that is equal to or less than that reported or forecast. This number tells you what weather stress category (Alert, Danger or Emergency) you are in and how safe your confined livestock may be. This stress is closely related to the "discomfort index" for humans as developed by the Weather Bureau, originally termed the "temperature-humidity" index (THI).

Stress categories

ALERT (THI of 75-78)

A forecast of temperature and humidity conditions in this range at time of handling, loading or before animals reach their destination calls for an "alert."

Additional precautions may be needed to avoid excessive losses or to prepare for higher THI.

DANGER (THI of 79-83)

Temperature and humidity readings in this range are not only dangerous to confined livestock, but there is a need to adopt additional measures to avoid severe losses.

EMERGENCY (THI of 84 and higher)

A severe situation has developed. Consider changing livestock handling and shipping plans. If plans cannot be changed, these four suggestions at a minimum should be followed:

- All handling stress should be kept at a minimum.
- Keep animals in position for free circulation of air.
- Provide shade if at all possible.
- Make water readily available for drinking.

If water is to be used to cool the animals, avoid "shock" from cold water in too huge quantities. A continuous sprinkling or coarse mist will lower the temperature to a safe level with a minimum of danger to the animals. Loading rested hogs onto wet bedding will minimize the heat stress problem during transit.

The best solution is to plan your livestock handling and shipping activities for the periods when the THI reading is below 75. Moving livestock when the THI is above 75 should be considered risky at best.

Cattle suffering from tall fescue endophyte fungus

Cattle consuming tall fescue forage that is infected with the endophyte fungus are particularly susceptible to heat stress during handling. Because humidity relationships for endophyte-stressed cattle are not yet known, a safe rule of thumb is to increase the temperature within Table 1 by 5 to 8 degrees to determine what weather stress category you are in. Handling such cattle during high temperature and humidity periods should be avoided if at all possible. If it is necessary to confine or transport them, it should be done during the night when temperatures are cooler. Even then caution should be used so cattle do not overheat.

Adapted from University of Nebraska Guide G07357 by Allen C. Wellman, Extension Economist, Marketing.

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Related MU Extension publications

- AGW1006, Hurry Up and Wait: Replanting Decisions for Pastures During Drought
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- AGW1009, Weather-Related Sales of Livestock
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=AGW1009>
- G3620, How to Reduce Heat Stress in Dairy Cattle
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G3620>
- G4669, Tall Fescue Toxicosis
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4669>
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