



Cattle Heat Stress Alert

- Cattle heat stress occurs when high ambient temperature and high relative humidity causes cattle to reach a point where they cannot cool their bodies adequately
- Temperature Humidity Index (THI) incorporates both environmental temperature and humidity in order to determine a more accurate representation of effective temperature (see figure and table below)
- The USDA Southeast Regional Climate Hub has developed a **SERCH LIGHTS alert for Cattle Heat Stress** that monitors ARS and NOAA forecasts of daily THI thresholds and sends an email alert when heat stress conditions are possible for your location

Animal Type	THI Threshold
Beef Cattle	75
Finishing Beef Cattle	72
Dairy	70
Dairy Heifers (0 to 1 year)	77
Dairy Heifers (1 to 2 years)	72

Source: St.-Pierre et al. 2003

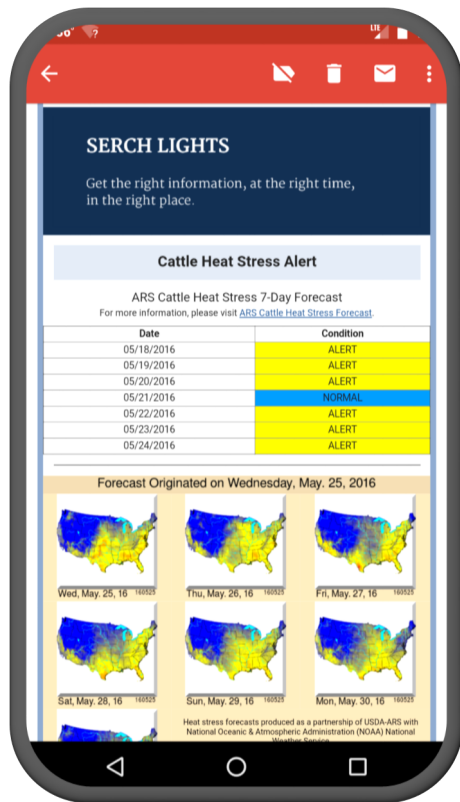
Heat stress impacts on cattle:

- Long-term decreases in *milk production and birthing rates* in dairy cattle (Klinedinst et al. 1993)
- Reduced dry matter intake, which inherently *reduces rate of weight gain*
- *Pregnancy rates decrease* above 70 THI and additionally above 74°F (Amundson et al. 2005)
- *Reduced fertility in both female and male cattle* (St.-Pierre et al. 2003)

DAIRY COW TEMPERATURE HUMIDITY INDEX (THI)																				HUMAN HEAT INDEX																												
Humidity %																				Humidity %																												
Temp °F	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	Temp °F	40	45	50	55	60	65	70	75	80	85	90																	
72	64	65	65	66	66	67	67	67	68	68	69	69	69	70	70	71	71	71	71	72	72	73	73	74	74	74	74	75	75	76	76	78	80	80	80	81	81	82	82	83	84	84	85	86				
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76	66	67	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75	76	76	77	78	78	79	80	80	81	82	83	84	83	84	85	86	88	89	90	92	94	96	98						
78	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75	76	76	77	78	79	80	81	81	82	83	84	84	85	86	87	88	89	90	92	94	96	99	101	103	105	107	109	111			
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82	69	69	70	70	71	72	73	73	74	75	75	76	77	77	78	79	80	80	81	82	83	84	85	86	86	87	88	89	90	91	92	93	94	96	101	104	108	112	116	121	126	132						
84	70	70	71	72	73	73	74	75	75	76	77	78	78	79	80	81	82	83	84	85	86	86	87	88	89	90	91	92	93	94	95	98	105	109	113	117	122											
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110	81	83	84	86	87	89	90	91	93	95	96	97	99	100	101	103	104	106	107	110	136																											

- Stress threshold for lactating cows. Respiration rate may exceed 60 BPM. Milk loses begin ~ 2.5 lbs/cow/day. Reproductive losses are detectable and rectal temperature exceeds 101.3°F. Caution for people depending on age, exposure and activity. People may not feel heat stress until 80°F and 40% humidity.
- Mild to moderate stress for lactating cows. Respiration rates may exceed 75 BPM. Milk loses ~ 6 lbs/cow/day. Rectal temperatures will exceed 102.2°F. Extreme Caution for people depending on age, exposure and activity.
- Moderate to severe stress for lactating cows. Respiration rate exceeds 85 BPM. Milk loses ~ 8.7 lbs/cow/day. Rectal temperature exceeds 104°F. Danger for people depending on age, exposure and activity.
- Severe stress! Life threatening conditions for lactating cows. Respiration rates are 120-140 BPM. Rectal temperatures may exceed 106°F. Extreme Danger of heat exhaustion and/or heat stroke for people when working in these conditions.

[Source.](#)



Visible signs of cattle heat stress (from West 2003):

- Decreased food intake
- Decreased activity
- Seeking shade
- Panting (increased respiratory rate)
- Sweating



Image source: [USDA ARS](https://www.usda.gov/ars)

Subscribe Today!

Sign up for the SERCH LIGHTS alert to receive emails when heat stress conditions are forecast for your area:

<https://www.serch.us/lights/>

Alerts come in the morning to give producers time to plan, adapt, and respond

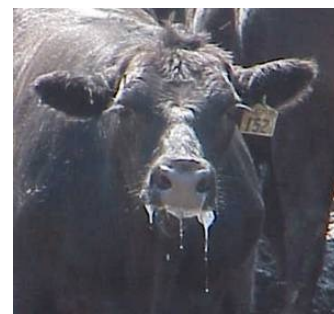


Image source: [USDA ARS](https://www.usda.gov/ars)

Adaptive management options for reducing heat stress impacts:

- Provide lots of available drinking water, shade, airflow, and remove fly habitats (Kerr 2015)
- Alternating feeding times and sprinkling can help minimize the effects of heat stress (Mader 2003)
- Applying 1/3 gallon of water to a cow's back every five minutes with fans providing air flow was very effective in decreasing heat stress (Smith et al. 2012)
- Follow weather trends and begin preventative measures before heat waves hit
- Try the [ThermalAid](#) app for detecting heat stress
- Consult the free courses available through [Animal Agriculture in a Changing Climate](#)

Contact the USDA Southeast Regional Climate Hub for more info:

Steve McNulty, smcnulty@fs.fed.us | <http://www.climatehubs.oce.usda.gov/southeast>

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