



### 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

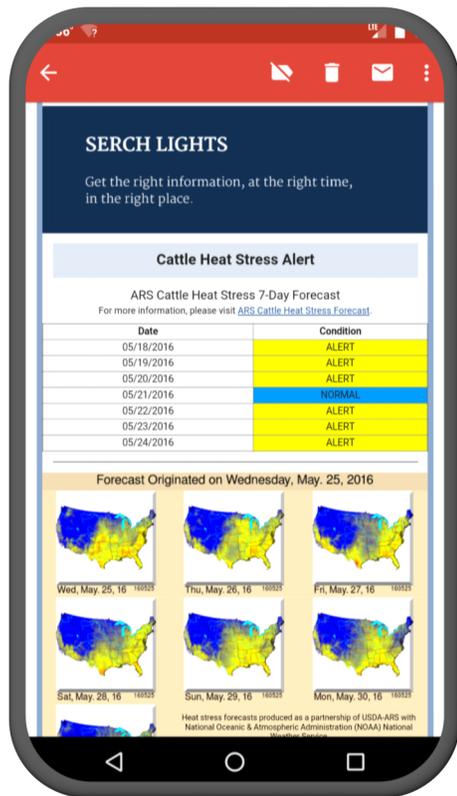
### Heat stress impacts on cattle:

- 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												
Temp °F	Humidity %																Temp °F	Humidity %											
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75		80	85	90	40	45	50	55	60	65	70	75	80
72	64	65	65	65	66	66	67	67	67	68	68	68	69	69	69	70	70	70	71	71	72								
74	65	66	66	67	67	67	68	68	69	69	70	70	70	71	71	72	72	73	73	74									
76	66	67	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75	76									
78	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75	76	76	77									
80	68	69	69	70	70	71	72	72	73	74	75	75	76	76	77	78	78	79	79	80									
82	69	69	70	70	71	72	73	73	74	75	75	76	77	77	78	79	79	80	80	81									
84	70	70	71	72	73	73	74	75	75	76	77	78	78	79	80	81	82	83	84	84									
86	71	71	72	73	74	74	75	76	77	78	78	79	80	81	81	82	83	84	84	85									
88	72	72	73	74	75	76	76	77	78	79	80	81	81	82	83	84	85	86	86	87									
90	72	73	74	75	76	77	78	79	79	80	81	82	83	84	85	86	87	88	88	89									
92	73	74	75	76	77	78	79	80	81	82	83	84	85	85	86	87	88	89	90	90									
94	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	92									
96	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94									
98	76	77	78	80	80	82	83	83	85	86	87	88	89	90	91	92	93	94	95	95									
100	77	78	79	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	98									
102	78	79	80	82	83	84	85	86	87	89	90	91	92	94	95	96	97	98	100	102									
104	79	80	81	83	84	85	86	88	89	90	91	93	94	95	96	98	99	100	101	104									
106	80	81	82	84	85	87	88	89	90	91	93	94	95	97	98	99	101	102	103	106									
108	81	82	83	85	86	88	89	90	92	93	94	96	97	98	100	101	103	104	105	108									
110	81	83	84	86	87	89	90	91	93	95	96	97	99	100	101	103	104	106	107	110									

- Stress threshold for lactating cows. Respiration rate may exceed 60 BPM. Milk losses begin - 2.5 lbs/cow/day. Reproductive losses are detectable and rectal temperatures exceed 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 rate may exceed 75 BPM. Milk losses begin - 6 lbs/cow/day. Rectal temperatures exceed 102.2°F. Extreme Caution for people depending on age, exposure and activity.
- Moderate to severe stress for lactating cows. Respiration rate may exceed 85 BPM. Milk losses begin - 8.7 lbs/cow/day. Rectal temperatures exceed 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: University of Minnesota Extension



## Visible signs of cattle heat stress

(from West 2003):

- decreased food intake
- decreased activity
- seeking shade
- panting (increased respiratory rate)
- sweating



Source: USDA ARS

## Subscribe Today!

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

[www.serch.us/lights/cattle-heat-stress](http://www.serch.us/lights/cattle-heat-stress)



Source: USDA ARS

## Adaptive management options for reducing heat stress impacts:

- Provide plenty of available drinking water, shade, and airflow, and remove fly habitats (Kerr 2015)
- Alternate feeding times and sprinkling can help minimize the effects of heat stress (Mader 2003)
- Apply 1/3 gallon of water to a cow's back every five minutes using fans for air flow to decrease 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

Contact the USDA Southeast Regional Climate Hub for more info:

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<https://www.climatehubs.oce.usda.gov/hubs/southeast>

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