



# Reducing heat stress on dairy cows

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**Topics Include:**

Ambient temperature guide  
Effects of heat stress on cattle  
Ration adjustments  
Other management suggestions

## AMBIENT TEMPERATURE GUIDE

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1. Optimum temperature ..... 25-65°F
2. Decreased feed intake ..... 80°F+
3. Reduced performance ..... 90°F+
  - a. Decreased production, 3% to 20% or more
  - b. Poorer conception, as low as 0%
4. Caution zone..... 100°F and 20% humidity
  - a. Take steps to ease stress and cool cow
5. Danger zone ..... 100°F and 50% humidity
6. Lethal zone ..... 100°F and 80% humidity

## EFFECTS OF HEAT STRESS ON CATTLE

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1. Cattle sweat only 10% as much as man.
2. Evaporative cooling is needed.
  - a. Body sprinkling
  - b. Good air movement
  - c. Shade
3. Feed intake is reduced by 8% to 12% or more.
4. Volatile fatty acid production in the rumen is decreased.
5. Panting can increase the cow's maintenance requirement by 20%.

## RATION ADJUSTMENTS

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1. Use high-quality forages to reduce heat produced in digesting and assimilating feed.
  - a. On many farms, whole-plant corn silage and aftermath cuttings of hay or haylage are higher in digestibility than first-cutting forages.
  - b. Make certain the neutral detergent fiber (NDF) level is at least 28% to 30% in the total ration dry matter (TRDM) to maintain production and a reasonably normal fat test. If NDF level cannot be estimated, make certain that acid detergent fiber level is at least 18% to 20% of the total ration dry matter.
2. Add extra water to the TMR, silage, or haylage if dry matter intake (DMI) drops seriously. This sometimes will increase DMI appreciably.

## RATION ADJUSTMENTS (continued)

3. Increase levels of certain minerals for lactating cows to compensate for higher losses from the body during hot, humid weather.

	<i>% in TRDM<sup>a</sup></i>	<i>Milk Response<sup>b</sup></i>
Potassium	1.50 <sup>c</sup>	+4.0%
Magnesium	.30	+7.0%
Added sodium	.50-.60	+4.0%
Example:		
Salt (39.3% Na)	.50-.60	
Sodium bicarbonate (27.3% Na) or sesquicarbonate (28.2% Na)	.80-1.00	

<sup>a</sup>Total ration dry matter

<sup>b</sup>In some research

<sup>c</sup>Part of the potassium requirement may be met from potassium carbonates to avoid excessive anionic content in the diet and to keep total chloride levels no more than .30 - .35% in the TRDM.

4. Provide most of the ration during the cooler periods of the day to minimize heat production when temperatures are higher:
- Early morning hours from 4:00 to 6:00 a.m.
  - Evening hours from 9:00 to 11:00 p.m.
  - Keep smaller amounts of feed available during daytime hours
5. Feed ensiled items more frequently to compensate for shorter bunk life during hot weather to prevent heating and improve feed intake.
- Remove from silos at feeding time, not ahead
  - Feed more frequently if heating or appreciable drop in intake occurs
6. Feed a higher fat ration (up to 5% to 7% of the total ration dry matter from all sources) if a reasonable dry matter intake (90%+ of usual) cannot be maintained. Use unprotected fat sources (i.e. oilseeds) to meet the 5% fat level. Protected fat sources should be used to meet fat levels between 5% to 7% in the total ration dry matter.
7. Keep water as cool as possible. Chilling water probably is not warranted except where water comes from the well at temperatures above 86°F or where water cannot be kept reasonably cool by shade. If chilled drinking water is offered, it should be the only source of water available. Cows prefer to drink warmer water when given a choice.
8. Consider certain feed additives that have been effective in some studies:
- Aspergillus oryzae (+ 4% to 8% milk)
  - Yeast culture or live cell yeast (+4% to 6% milk)
  - Niacin (+3% to 6% milk)
  - Dried brewers yeast
  - Fat soluble vitamins (A, D, and E)

# OTHER MANAGEMENT SUGGESTIONS

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1. Keep cows inside during the day if it is cooler for them.
2. Provide shade, especially over feeding areas and on pasture.
3. Provide extra air movement.
  - a. Install fans in stall barns
  - b. Install fans in holding areas
  - c. Reduce time in holding areas by decreasing size of groups
  - d. Spray cows with water and keep them in air stream created by fans (+22% milk)
  - e. Run water over shade or roof for evaporative cooling (+37% milk)
4. Increase sanitation during hot, humid weather.
  - a. Greater risk of mastitis and other infections from environmental microorganisms
  - b. Need more bedding, cleaning, and disease control
5. Make certain ration is balanced for dry cows and springing heifers to minimize infectious and metabolic diseases.
6. Provide a clean and abundant supply of drinking water.

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