

Cow Comfort and Cooling

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Keys for Cow Comfort

- Adequate feed access
- Adequate water access
- Clean, dry, comfortable resting area/location
- Adequate ventilation
- Thermal relief
 - Cold → Wind protection (barn or wind breaks)
 - Hot → Several phases/steps - *Focus for today*

Heat Stress Evaluation Tool

ThermalNet (website)

- <http://thermalnet.missouri.edu/index.html>
- Website provides educational information about the thermal environment and how it can affect dairy cows

Thermal Aid APP

- Smartphone app
- Can pull live weather data to calculate THI
- THI can be used to help determine heat stress conditions
- Has a timer use when calculated respiration rate

1. Drinking Water Systems
2. Shade Systems
3. Adequate ventilation in freestall, loafing or bedded pack barn
4. Fan Systems
5. Sprinkler Systems

IMPLEMENTING HEAT STRESS RELIEF SYSTEMS – ACTIONS TO TAKE

Drinking Water Systems

1. Daily intake – up to 50 gallons or more
2. Drinker space – one “hole” or 2’ of trough
3. Minimum of 15 to 20 cows per drinker not adequate for hot weather.
4. Provide for 25% of group when hot.
5. Provide water at exit of parlor.

Shade Systems

1. Holding pen

- a) Needed because cows crowded.
- b) Roof, if present, provides for shade.
- c) If no roof, construct frame and shade cloth structure.
 - i. Remove in fall.
 - ii. Reinstall in spring.

Shade Systems

2. Feed Bunks

- a) Improve cow comfort while eating.
 - i. Cows will tend to eat more.
 - ii. Cows will go eat.
- b) Improve “bunk life” of feed.

Shade Systems

3. Resting Areas and Freestalls

- a) Freestall barn itself provides shade
- b) Required for lots or pasture systems
 - i. Provide 25 ft² to 50 ft² per cow.
 - ii. Orient shade structure north and south.
 - iii. Watch location of shade with respect to fence.

Adequate Ventilation

- Natural Ventilation System
 - Need open area high for both winter and summer
 - Open curtains and/or remove barn siding to allow large openings in both sidewalls and endwalls.
 - If ‘cooling fans’ used, orient fans to aid wind to ventilate barn
- Mechanical Ventilation (Hot Weather System)
 - Need enough fan capacity to exchange all air in barn at least once per minute
 - Need openings distributed throughout barn as air inlets to match installed fan capacity. Inlet area (in²) = (total cfm) / 4

Fan Systems

1. Fan Location

a) Holding Pen

Front of pen, blowing toward back.

b) Freestalls

Above neck rail, tilted slightly to blow across cows lying in stalls.

c) Loafing Areas

Arranged to provide air movement across cows lying in resting areas.

Fan Systems

2. Fan Selection

- a) Effective throw – 10' per foot of diameter of fan for open propeller fans
- b) Typically (historically) most economical selection is 36", ½ h.p. direct drive fan.
- c) “High velocity” fans may have longer throw but check in barn.

Fan Systems

3. Electrical Supply

- a) 36", ½ h.p. direct drive fan uses 5 to 6 amps at 110 volts or 2½ to 3 amps at 220 volts.
- b) Installation cost of electrical system can be quickly recovered with effective cooling system which includes sprinklers.

Fan Systems

4. Operation and Management
 - a) Operate in holding pen during and potentially prior to milking.
 - b) Operate at all temperatures greater than 75 °F.
 - c) May operate at all temperatures greater than 70 °F at night.
 - d) Lower “on” temperatures may be needed for high producing cows.

Sprinkler Systems

1. Emitter Types

- a) Sprinklers
- b) Drippers
- c) Misters
- d) Foggers

Sprinkler Systems

2. System Selection and Location

a) Sprinklers

- i. Feed bunk alleys – 180° pattern
- ii. Holding pens - 360° pattern

b) Foggers on Circulating Fans

- i. Use when wet floors and surfaces not acceptable (lots & loose housing)
- ii. Air is cooled so cows must be located in throw of fans to receive cooling.

Sprinkler Systems

3. Water Supply

a) Importance of Quality

b) Quantity Issues

- i. Total daily amount used acceptable.
- ii. Rate of delivery can be a problem.
 - 15 emitters at 20 gal/hr need 5 gpm system.
 - 40 emitters at 20 gal/hr need 13.3 gpm system.

Sprinkler Systems

4. Operation and Management

- Operate at all temperatures above 80 °F except holding pen.
- Wet cows then allow to dry.
- 1 to 5 minute “on time” with 15 to 45+ minutes off time.
- Use 24-hour timer to turn off at night (desire is allow floor to dry).

Questions or Discussion

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