

NAVAN VETERINARY SERVICES – JULY 2011 NEWSLETTER

All animals have a zone of thermoneutral temperatures that are conducive to normal function. Once out of this zone, excess energy is required to keep their bodies cool or warm. When a dairy cow cannot get rid of adequate heat to maintain body temperature – heat stress.

Heat stress is determined by 2 factors – temperature and humidity. Once a temperature – humidity index (THI) is above 72, signs of heat stress are visible.

The following temperatures and humidity reach a THI of 72.

- 29°C - 25% humidity
- 25°C - 50% humidity
- 23°C - 95% humidity

These conditions are considered mild stress levels. On June 27 and 28 every barn I was in, was above 25°C and 50% humidity.

Cows respond to heat stress by:

- increasing respiratory rates
- decreasing activity
- increasing water intake
- increasing blood flow to the skin
- less blood flow to the body core
- decrease dry matter intake

All the above lead to reduced milk production as more energy is used for maintenance.

Reproduction is affected:

- heat signs and length decrease
- fertility rates decrease
- follicles are smaller
- more early embryonic death
- reduced fetal growth

Severity of heat stress is affected by

- temperature and humidity
- length of heat stress period
- amount of night cooling
- ventilation and air flow
- cow factors – color, size, milk production
- water availability

How can management alter heat stress impact

- adjust ration
- adjust environment

.../2

Ration adjustment

- fresh, palatable, high quality feed
- uniform mixing and delivery
- feed more at night
- feed best forages as forage digestion creates the most internal heat
 - lower NDF – faster digestion

Water

- intake will increase by 20-50%
- adequate pressure to supply needs when cows want to drink – 50% within ½ hour of milking
- clean and fresh

Ventilation

- ensure adequate air speed
- ensure adequate air inlet area
- ensure adequate air exchange per minute

Generally the following are guides as to air exchange per fan size

6 foot fan	-	40,000 CFM (cubic feet per minute)
5 foot fan	-	30,000 CFM
4 foot fan	-	20,000 CFM
3 foot fan	-	10,000 CFM

Summertime needs for your livestock are:

Adult cattle	-	600 – 1000 CFM
Young stock	-	150 – 250 CFM

Airspeed is the mechanism that fans cool cattle. Goal should be 250-400 feet per minute. Inlet opening determines air speed through the barn as long as fan sizing is adequate. Over the past 2 weeks I have seen inadequate inlet space, fan power and air speed in barns that we service. At the same time I have seen more adequate ventilation conditions. We now have instrument at the clinic which can measure wind speed, temperature, humidity as well as light intensity. An example of tunnel ventilation needs is as follows:

Herd	-	100 cows
Ventilation needs	-	600 CFM per cow
Total need	-	100 x 600 = 60,000 CFM

Fan requirement – at least: 2 x 5 foot fans

Air inlet sizing is approximately 2 sq.ft/1000 CFM
= 120 sq.ft. of inlet opening

This is affected by barn width and height.

Big Butt ceiling fans in free stall barns move a great volume of air at a lesser speed than a tunnel ventilation barn but are perfectly adequate if spaced properly.