



Unit : Fluid therapy in cattle
Lesson : 5

Heat stress

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Heat stress

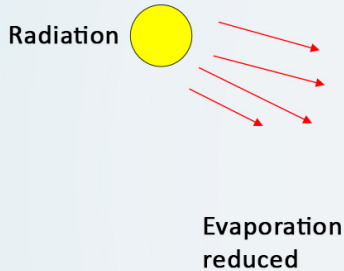
The point at which a dairy cow cannot dissipate an adequate quantity of heat to maintain normal body temperature

Risk factors

- Abnormal / sudden rise in temperature
- Continued high temperature on a given day
- High temp with high humidity coupled with low wind speed
- Wide difference in day and night temperatures

Risk factors

- Air temperature= 94°F
- Relative humidity= 90%
- Cattle is not under shade



Reduced conduction
& convection

- Heat production > net heat loss → body temperature raises

Risk factors

Temperature humidity index (THI)

$$\text{THI} = 0.72 (\text{Cdb} + \text{Cwb}) + 40.6$$

where Cdb = dry bulb temperature (0C)

Cwb = wet bulb temperature (0C)

Dairy cattle show signs of

heat stress when THI is higher than 72

Relative humidity

C	20	30	40	50	60	70	80	90	100
22	66	66	67	68	69	69	70	71	72
24	68	69	70	70	71	72	73	74	75
26	70	71	72	73	74	75	77	78	79
28	72	73	74	76	77	78	80	81	82
30	74	75	77	78	80	81	83	84	86
32	76	77	79	81	83	84	86	88	90
34	78	80	82	84	85	87	89	91	93
36	80	82	84	86	88	90	93	95	97
38	82	84	86	89	91	93	96	98	100
40	84	86	89	91	94	96	99	101	104



Heat Stress

➤ Dairy cattle show signs of heat stress when THI is higher than 72

Direct Effects of Heat Stress

- Feed intake reduced
- Changes in behavior
- Metabolic changes
- Immune status reduced

Direct Effects of Heat Stress

- Buffalo are highly sensitive to heat stress
- Reports indicate that milk yield, growth and fertility are all reduced during periods of high ambient temperature
- The incidence of silent heat or poor expression will be more common at high temperatures during summer particularly in buffaloes

Indirect effects

- Increases severity and distribution of livestock diseases and parasites.
- Spread of disease and parasites into new regions
- Produce an increase in the incidence of disease

Clinical manifestations

- Reduced feed intake
- Reduced milk yield
- Salivation



Clinical manifestations

- Protruded tongue
- Shallow rapid respiration
- Depression
- Comatose



- **Increased metabolic state**
- **Increased oxygen consumption**

- **Hypoxaemia, skeletal muscle weakness, acidosis**
- **Deterioration of cellular function/ integrity**
- **DIC**
- **GI (desquamation, endotoxin, bleeding)**
- **Cerebral and cardiac function**

Strategies

- **NSAID -----???**
- FLUID THERAPY....
- ENEMA
- LAVAGE
- DRINKING WATER

Environmental modification

- ▶ Shades
- ▶ Ventilation
- ▶ Wetting
- ▶ Mist

Trees

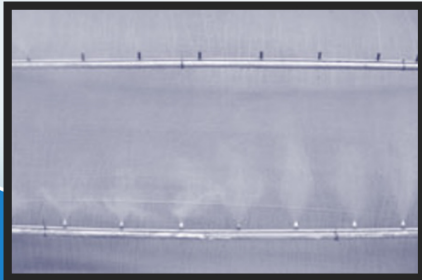


- ▶ Tree shades have proved to be more efficient

- It is necessary to provide some misters or sprinklers
- The goal is to increase **evaporative cooling** by wetting the skin



- ▶ Wind flow at a rate of 5 km/ hr
- ▶ Fans -increasing air flow
- ▶ It is necessary to provide sprinklers





- Dietary protein density, Ration protein level should be balanced
- Buffers (sodium bicarbonate and magnesium oxide) should be added
- Potassium Magnesium level, Maintenance energy in the ration should be increased
- Supplemented with antioxidants (Vit E and Selenium)
- Adding yeast or yeast cultures to the ration
- Sufficient watering facility for all the animals.
- **Mineral mixture supplementation, Sodium bicarbonate supplementation and Yeast supplementation improved the milk yield (9.43%) and fat content (4.9%).**

Fluid therapy in cattle

1. Fluid distribution in body and Diagnosing dehydration
2. Calculation of fluid deficit and choice of fluids
3. Acid- base imbalances and rehydration management
4. Acid- base imbalances and rehydration management- Part II
5. Heat stress



Thank you