



## Avoiding Heat Stress in Calves

As summer temperatures creep into the 80's (>27°C), 90's (>32°C) and above, heat stress can negatively impact calf performance. Heat stress affects calf health by causing rapid dehydration and reduced immune system function. Researchers have determined that heat stressed calves often have reduced circulating immunoglobulin concentrations and increased stress hormone concentrations <sup>(1)</sup>. Elevated body temperatures ranging from 103-108°F (39°- 42°C) can result in very sick calves.

Growth rates are reduced during periods of heat stress; secondary to lower feed intakes and higher maintenance energy requirements. When ambient temperatures exceed 80°F (26.7°C), calves must burn more energy in order to dissipate heat from the body by sweating and increasing respiratory rate. In this case, less of the nutrient consumed is devoted to growth and average daily gains suffer.

Efforts should be made to identify and avoid heat stress in calves. If you see increased respiratory rates, open-mouthed breathing, decreased appetite, and reluctance to move, your calves may be suffering from heat stress. This summer, consider the following tips to assure proper calf health and growth is maintained.

### Environment:

**Reduce sun exposure** – Use barns and hutches that do not allow sunlight to contact the calf. Eighty percent shade cloth is recommended on greenhouse barns and translucent hutches. A study performed by Lammers et al. in Pennsylvania showed daytime air temperatures inside translucent hutches were 3.6°-5.4°F (2-3°C) higher than outside air <sup>(2)</sup>. The study also noted higher calf body temperatures, higher respiratory rates, higher water intake, and lower feed intake in translucent hutches when compared to opaque hutches.

**Improved air flow** – Naturally ventilated buildings should have all vents completely opened including ridge and eave vents, as well as sidewall curtains. In addition to open vents, hutches may also have the back end elevated using wooden or concrete blocks to improve ventilation. Hutches should also have enough space in between them to provide for adequate air flow. For mechanically ventilated calf barns assure a 45 second air exchange rate <sup>(3)</sup>. This means that all of the air within the barn should be replaced with fresh air every 45 seconds.

**Bedding** – Consider the use of sand bedding. Sand bedding does not insulate the calf. It also may help reduce the fly population.

## Avoiding Heat Stress in Calves (cont.)

### Diet and Management:

**Free choice water** – Constant access to free choice, fresh water is a must for summertime calf rearing. Calves exposed to heat stress can consume 3-6 gallons (11-22 liters) of water per day. If calves are running out of water between feedings, a third water feeding may be necessary to prevent dehydration and assure proper health.

### Stresses

Perform stressful events in the early morning. Examples of stressful events include moving, grouping, vaccinating, dehorning, and castrating. Evening temperatures seem cool, but animal body temperatures lag behind ambient temperature by 4-6 hours. The morning is the best time to conduct potentially stressful activities.

### Sources:

- (1) Stott, G.H., F. Wiersma, B.E. Menefee, and F.R. Radwanski. 1976. Influence of environment on passive immunity in calves. J. Dairy Sci. 59: 1306.
- (2) Lammers, B.P., J.W. Van Koot, A.J. Heinrichs and R.E. Graves, 1996. The effect of plywood and polyethylene calf hutches on heat stress. Applied Engineering in Agriculture 12(6): 741.
- (3) Bungert, Kimberlee. "Calves Feel the Heat, Too". Dairy Herd Management (1 May 1998).