

CALVING EASE

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Stress and Calf Management

[Our guest author this month is Dr. David Hale, Perry Veterinary Clinic. After hearing his presentation on this subject at our February meeting, we asked Dr. Hale to expand his notes for a full newsletter. We are indebted to him for his careful and thorough job. Thanks Dave.]

The immune system is responsible for the protection of the body. It protects against invaders such as bacteria, viri, cancer cells and allergens. In order to protect the body the immune system has to do three things. First, invaders are recognized as foreign to the body. Second, these foreign materials are sought out. Finally, the immune system destroys them.

A calf's entire immune system response can be dramatically changed by stress.. The first half of the letter describes the physiological consequences of stress on a calf's immune response. The second part examines current management practices that are major stress points in a calf's life.

Consequences of Stress

When a calf is stressed the brain signals the adrenal glands to begin making a steroid hormone, cortisol. Five of the many effects of cortisol are:

1. Blood pressure increases.
2. Strength of heart muscle contraction increases.
3. Blood is diverted from peripheral organs to vital ones (for example, from toes to heart and kidneys).
4. Blood sugar goes up and sugar use by body cells goes down.
5. Acute reactions of tissue cells to trauma and/or toxins is prevented or inhibited.

We usually see these five effects of cortisol as positive. That is, they are critical for survival in life threatening situations. But! There is a downside to cortisol, too. It decreases the body's defense mechanisms in at least four ways:

1. Cortisol decreases white blood cell movement to infection sites and decreases eating of foreign material by body cells (phagocytosis).
2. Cortisol decreases interferon production (interferon is the body's alarm system for viral infections).
3. Cortisol decreases production of two types of white blood cells (eosinophils and lymphocytes).
4. Cortisol decreases antibody production.

All this adds up to the body turning off the immune defense mechanisms in an attempt to survive crisis situations. On one hand, this may increase short term survival. On the other hand, the end result is often overwhelming infection and death.

How much time does a calf's body take to get over stress-induced cortisol release? It's hard to give a short answer to that question. Stress varies a lot in its intensity and duration. Compare, for example, stress from dehorning to that from weaning. Dehorning is an intense, short-term stress. The effects of this stress-induced cortisol release are usually gone within 18-24 hours. In contrast, weaning-induced stress may result in moderate amounts of cortisol release for as long as a week. The cumulative effects of this constant suppression of the immune system are frequently seen as decreased rates of gain and/or pneumonia in calves three to five days after weaning. Fortunately, most calves experience only short-term moderate weaning stress because they respond to weaning by quickly increasing starter consumption. The effects of this weaning-induced cortisol release are usually gone within 24 hours after nutritional needs are being adequately met.

Management and Major Stresses

Dry Cow Housing, Body Condition Score and Nutrition

Nutrients pass across the placenta to the calf. Any imbalance or shortage of essential nutrients may mean weak, poor-doing calves. Overcrowded conditions, inadequate bedding or poor air quality all stress the dry cow. The cortisol release by the cow will negatively effect the calf even before birth.

Dystocia

Calving is initiated by increased levels of cortisol. Therefore, the newborn's immune system is already compromised. Dystocia or hard calving results in conditions unfavorable to the calf: oxygen deprivation, tissue trauma and fluid accumulation in the lungs to name three. These all add to normal birthing stress.

Pathogen Load

How clean is the calving environment? *E. coli* bacteria are as easily absorbed into the blood stream as are antibodies from colostrum. The first mouthful has to be one gallon of high quality colostrum, not manure.

Weather

We have no control over this. Cold, heat, dampness, humidity are all potent stresses. This is especially true for calves which are already sick. Because of cold winter weather some calves may be on a marginal plane of nutrition and be very sensitive to stress.

Environment

Air quality. How good is the air quality where your calves live? Take a breath just one foot above the bedding in calf housing - that's the air the calf breathes. Is it free of ammonia and dusts? Dry bedding. When you kneel on the calves' bedding do your knees stay dry and warm?

Management Tasks

Tail docking, dehorning, extra teat removal, weaning, and moves to group housing are all necessary steps in a calf's life. But, all can be major stresses, too. The best practice is to limit traumatic management tasks to one per week. Although this may be inconvenient, it will help calves from being immunologically overwhelmed. We have to remember that our alternative of treating sick calves is both expensive and inconvenient also. Addition of

antibiotic crumbles to the feed is very helpful before the stressful management tasks are performed.

Vaccinations

A vaccination is useless unless the immune system is capable of mounting a good response. Do not vaccinate immediately before or after any of the management tasks above.

If you know of someone that doesn't currently receive **Calving Ease** but would like to, tell them to **WRITE** to **Calving Ease**, 11047 River Road, Pavilion, NY 14525 or to **CALL** either 585-591-2660 (Attica Vet Assoc. office) or 585-343-8128 (Offhaus Farms Office) or **FAX** (585-591-2898) or **e-mail** sleadley@frontiernet.net or pams91@2ki.net. A limited number of back issues may be accessed on the Internet at www.calfnotes.com and clicking on the link, Calving Ease.