Lactanet – Canadian Network for Dairy Excellence

The story of Buddha: The stressful life of a cow

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There is more stress in a cow's life than one might imagine. And like for humans, stress can be useful in some situations. But when there is too much stress being experienced too often or for long periods the consequences can have an adverse effect on a cow's health and productivity.

Using the story of a cow named Buddha, we will examine the stressors that arise in the life of a cow, and discover she might not be as Zen as her name suggests.

The story of Buddha

With a name like Buddha, this calf seemed destined for a stress-free life. But it was not to be. Buddha was exposed to the effects of the stress experienced by her dam before she was even born. Last year, one hot day followed another while her dam was drying off. The ventilation system in the barn where dry cows were housed at Temple Farm was inadequate to mitigate the effects of extreme heat. The aftereffects of heat stress can last a lifetime.

Buddha was born four days early with a low birth weight of 5 kg, a deficit that would persist until puberty. When it was Buddha's turn to give birth to a calf, she would produce 5 kg of milk per day less than her congeners whose dams were not exposed to extreme heat during dry-off. What the producer didn't know was that the stress experienced by Buddha's dam during the first weeks of pregnancy permanently altered her calf's genes.

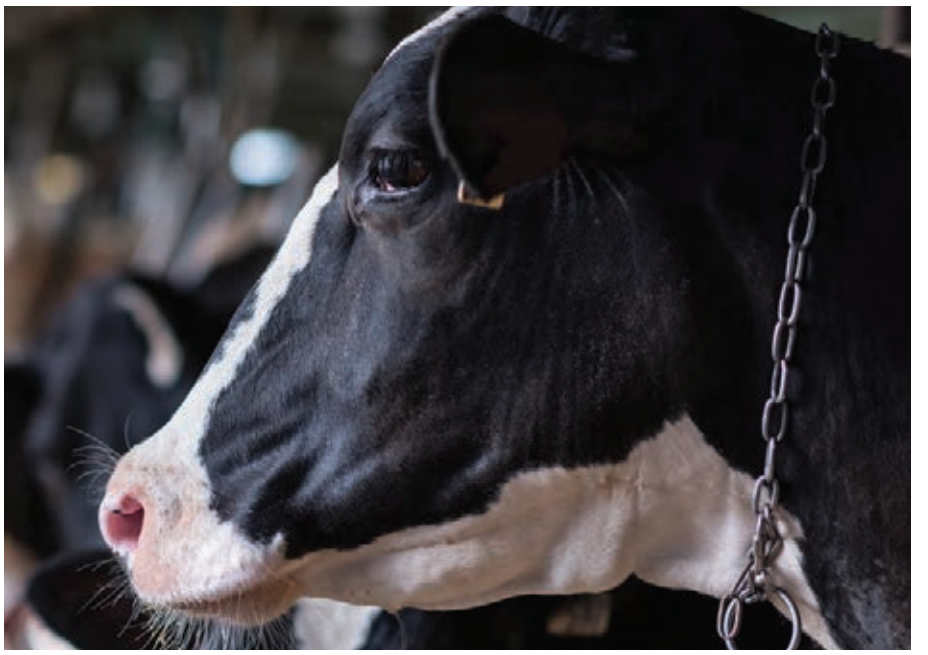
A lot of stress for a little calf

Although chains weren't required to extract Buddha from her warm and cozy nest, the birth itself was an unsettling event. Despite the fact that she promptly received colostrum freshly milked from her dam, Buddha was less able to absorb antibodies than were her companions whose dams did not suffer from thermal stress during the dry-off period. As a result, her natural immunity was weakened. Buddha was quickly transferred to the small pen where she would be housed alone until she was weaned.

About 10 days later, Buddha suffered from an episode of diarrhea, became dehydrated and required veterinary attention. In the weeks that followed, Buddha received all the care she needs, including vaccines and dehorning, and then it was time for weaning. Buddha was then housed in a larger pen with older congeners, which meant she was exposed to a host of new microbes against which she was not yet fully equipped to defend herself. All these disruptions led to a state of physiological stress, causing inflammation and hindering her intestinal development. This would have a lifelong impact on the health of her immune system and her susceptibility to disease.

Lactation: A period of major adjustment

Like the neonatal period, the first weeks of lactation were among the most stressful in Buddha's lifetime. To begin with, she had to adapt to a new environment and new habits (handling for milking, a new ration, etc.). Simultaneously, her body was going through abrupt hormonal changes that would enable her to produce large quantities of milk. The transition period was crucial in preparing for that upheaval. Would Buddha's owner be able to provide her with better living conditions than her dam enjoyed?



After calving, Buddha seemed to have been doing well, but a routine BHB test revealed subclinical ketosis. This was not surprising since more than 50 per cent of cows suffer from a metabolic disorder in early lactation. The early culling that resulted had a significant impact on herd productivity. Despite all the efforts made to minimize the incidence of health issues in early lactation, the problem remained significant.

Could the best way to deal with this be to manage her stress and inflammation?

All cows experience some level of systemic inflammation in the first few days after calving. The inflammatory state plays an important role – for example, in initiating calving, producing contractions and expelling the placenta. But when prolonged, an inflammatory state is also associated with a higher risk of disease, reduced feed intake and lower milk production over the whole lactation.

In spite of her outstanding genetics, an impeccable ration and a comfortable environment, Buddha's milk production proved disappointing. And, as if this wasn't enough, mastitis added to the mix! Buddha's owner was slowly realizing that she was costing him much more than she was bringing in.

Stress 101

When an animal is in a stressed state, oxygenation and energy expenditure increase, digestive processes are disrupted and behaviour is altered. When such disturbances are too intense or occur too frequently, however, they eventually damage organs and disrupt their functions. This is what is known as chronic stress, a state that can lead to a greater risk of disease and metabolic disorders and disappointing production levels.

Stress: a new avenue to explore

Who would suspect that a series of stressors of varying importance could lead to fragile health and so-so production? Nonetheless, research findings over the past few years have steered us in that direction. It is an interesting avenue to explore to enable cows to reach their full potential.

So where do we start?

We don't yet have the means to measure stress directly, but we do have access to other tools, like the Transition Cow Index®, KetoLab and the milk fatty acid profile. These can be used as stress indicators, and we can then take action to address the underlying factors. The Lactanet team is always ready to help you interpret your data and guide you in developing an action plan.

There's more than heat involved! Here are some of the sources of stress for our dairy cows: