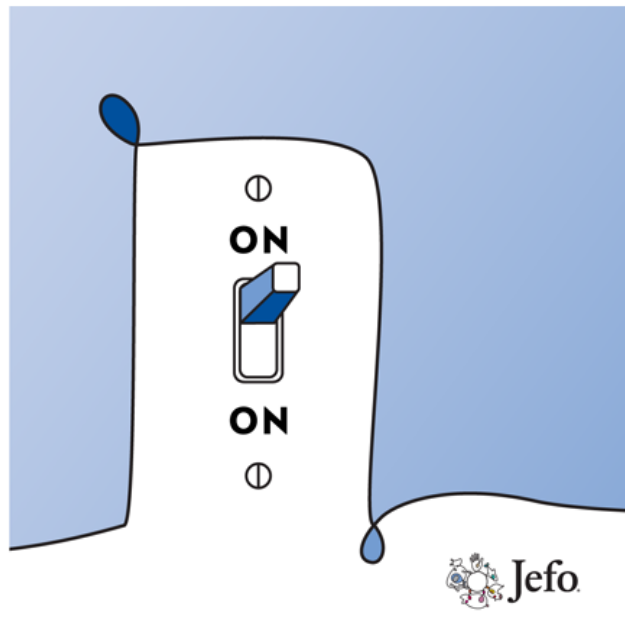


You can't turn off dairy cow stress

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Stressors resource center helps shed light on its complexities

How do you save energy? That's easy. Turn off the lights. Unfortunately, when it comes to dairy cow stress, it's not that simple. You can't turn off stress that easily.

Stress is caused by stressors. We recognize more than 30 different stressors that can affect the health and performance of a dairy cow. However, if you read through dairy-related articles, you may realize that the industry tends to focus only on a small handful of stressors and address each of them individually. Your reality at the farm level is that stressors interact with each other and compound, negatively impacting cow health, performance, reproduction and longevity.

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Dairy cow stress is complicated. Knowing how stressors work and how they affect your cows will help you reduce their negative impact on your herd — and improve your revenue.

The concept of stress and strain

Domesticated food animals are prey species. When they perceive a threat, their instinct is to avoid a predatory attack. Things are different under modern farming conditions since cows have very little risk of being eaten by a predator. Today, a perceived threat (stressor) comes from different sources and often leads to metabolic strain. As a result, your cows will make a physiological or behavioral change to maintain balance.

A key step is to understand that each cow handles these changes differently. During the Jefe RumiNation Podcast *Impacts of Stress and Strain on Reproductive Health* (Series 3, Episode 6), Dr. Matt Lucy, professor at the University of Missouri, said it's important to know the difference between stress and strain. "All cows are stressed, but the strain is how the cow responds to that stress. For example, we have a lot of cows in a herd that make 100 pounds of milk per day. The stress is the production. However, the strain is how she responds to that. We want our cows to have very little strain."

According to Dr. Lucy, the amount of strain determines the impact stress will have on production and fertility. Genetics can help as it allows a producer to select for a more resilient cow. "We want cows that can handle these stresses," says Dr. Lucy. "Once we have the right kind of cows, then, as a producer, you have to manage the remaining strain. You cannot fix everything with genetics — you have to be a top producer and manage the remaining strains like heat stress, nutrition, bunk space and so forth."

The key is to identify the stressors that are having the biggest impact on you, your cows and your team, and then incorporate solutions to reduce the strain they cause.

Know stress, no stress

You know the old adage: Knowledge is power. Knowing more about stress helps eliminate the effects of stress. Jefe Nutrition has outlined five key stress categories and identified solutions to help keep cows comfortable, healthy and productive:

- Weather
- Feed Intake Issues
- Standard Operating Procedures
- Stage of Production
- Herd health

1) Weather

As temperatures climb, we hear a lot about heat stress. A dairy cow experiences stress when her heat load is greater than her capacity to remove the heat. She often will adapt by modifying her metabolism to reduce heat production.

To minimize the impact of heat stress on your herd, a whole-farm approach is essential. The goal is to maintain good health, feed intake and production levels. That approach is even more critical when the Temperature-Humidity Index (THI) reaches 68 or higher.

Producers should rely on heat abatement strategies, such as the use of fans, misters and shade. Make sure these tools are well maintained and effective – this is an area that is sometimes overlooked but needs to be well established. In addition, it's important to increase clean water supplies and avoid overcrowding as much as possible. Other points to consider:

- deliver feed during the coolest time of the day
- increase nutrient density of the ration in anticipation of lower dry matter intake
- feed high-quality forages
- increase feeding frequency to avoid heating of the ration

During heat stress, it's also important to adopt key precision nutrients. B vitamins are essential to supporting efficient glucose and protein production, and research shows that a blend of protected B vitamins can help cows cope with heat stress. By supplementing during known stress periods, we can overcome many of the negative outcomes of strain, which in turn will help drive your farm profitability.

Don't forget dry cows in the heat. It's estimated that heat-stressed dry cows account for more than \$800 million in milk loss annually in the United States. Conversely, taking steps to cool dry cows was shown to add to farm profits. Studies show that supplementing a blend of protected B vitamins (choline, folic acid, B12 and riboflavin) before and after calving reduced subclinical ketosis, and lowered incidence of retained placenta and metritis. Another reason to focus on dry cows is to help the calf she is carrying. Research shows that calves born from cows who experienced heat stress in late pregnancy will have lower birth weight, reduced immunity and less milk in their first lactation.

Heat isn't the only "weather" stressor you need to worry about. Other weather-related stressors include extreme cold, humidity, excessive rain and snow, changes in daylight, and other adverse weather events. Take home message: Any weather event that impacts dry matter intake, impacts cow performance.

2) Feed Intake Issues

During the RumiNation Podcast *Impacts of Stressors on Physiology and Health of Dairy Cows* (Season 3, Episode 4), Dr. Trevor DeVries, University of Guelph, said cows can suffer from nutritional stress. This can be physiological, such as how her body literally reacts to a change in diet. Or it

can be perceptual as the cow simply views a diet change as different and may stop eating. Or it could be behavioral due to competition for bunk space, changing a cow's eating time and the number of meals, which in turn will negatively impact rumen health, diet absorption and digestibility. Anything that negatively impacts intake then has a trickle-down effect on energy balance, production and overall cow health.

At this year's American Dairy Science Association's annual meeting, two research reports were presented about DMI and nutritional stressors. Faith Reyes and her University of Wisconsin colleagues presented research related to stocking density and how more competition at the bunk lowered intake. She concluded the following: "As stocking density increased, cows appeared to modulate their bunk visits and eating rates to adjust for greater competition and less opportunity to gain feed bunk access."

In the second report, Francesca Mazza presented a poster on feed hygiene. The report reviewed bacteria, yeasts and molds commonly found in various feed types on farms across the United States. When ingested in high amounts, these organisms can cause negative health issues, plus lead to reduced feed intake and decreased milk production. Mazza and her colleagues surveyed 8,942 feed samples collected from farms across 35 states. The results showed that spoilage organisms and potential pathogens were more prevalent in the TMR than in the individual fermented feed components of the diet. This survey highlights the importance of proper feed management practices and reducing feed contamination as a potential stressor.

Dr. Lucy concurs. He says there is no substitution for good, quality nutrition. Dr. Lucy recommends consistency. "In a perfect world, cows get the same TMR at the same time delivered by the same person using the same tractor." He adds that this type of balance acts like a suit of armor for cows and helps them manage the strain from potential stressors.

3) Standard Operating Procedures (SOP)

Day-to-day activities can affect cows. Your daily or weekly routine procedures may seem harmless but can add up in excessive time for cows away from feed, too much time standing out of their stalls, and negative social interactions. All of which can cause issues. Having SOPs in place can help maximize efficiency and reduce stress.

Here's a short list of potential management-related stressors:

- human-animal interactions
- stocking density
- group changes
- bunk space
- housing issues
- herd health checks
- social stress

Dr. DeVries says social stress can have a negative impact and come from a variety of places. “Cows are social animals, and they like to be in social environments,” explains Dr. DeVries, “but there are aspects of a social environment that may have a negative effect on cows and can actually be stressful. For example, overcrowding at the feed bunk or in the parlor’s holding pen.”

Dr. DeVries also mentioned the challenges of mixed-parity groups and how mixing young animals in with older animals can cause stress, especially in the younger cows.

When it comes to reducing management-related stress, attention to cow comfort is also critical. The rule of thumb: A comfortable cow is a cash cow.

Key factors to help ensure cow comfort include:

- adequate feed and resting space
- protection from the elements
- access to high-quality feed and water
- training employees on proper animal interactions

In particular regarding this last point, cows should not fear their handlers. A fearful cow is a stressed and less productive cow. Dr. DeVries said acute stressors, such as poor handling, can have a direct impact on cow physiology and her productivity. “A clear example of that is bad handling of cows in the milking parlor,” says Dr. DeVries. “A stress like that can cause a cortisol spike in cows which may lead to a block or reduction in oxytocin release which may limit milk let down.”

There’s a new tool called farm synchronization that can help eliminate stress and maximize feed efficiency. During the RumiNation Podcast *Increase Milk Production with Farm Synchronization* (Season 2, Episodes 6 and 7), David Greene of Greene Ag Solutions and Barton, Kiefer and Associates Consulting Group, discussed how this approach can help improve milk production and labor management. According to Greene, farm synchronization marries the three main management centers: 1) feeding operation, 2) milking operation and 3) herd management. “The goal is to synchronize the milking schedule and the feeding schedule with the activities of the herd management team, whether it’s breeding or herd health checks. If we can get these three areas working together, we can maximize feed efficiency,” Greene says.

According to Greene, the goal is to feed cows about two hours ahead of their time in the parlor. This promotes more frequent smaller meals, which means extra intake, more efficiency and a healthier, more productive cow. If each department can communicate and work together, Greene said producers can see an increase of 2-3 pounds of milk for the same or less feed intake. “Every movement on the farm needs to be centered around maximizing the efficiency of milk production,” adds Greene.

4) Stage of Production

Having a calf can be one of the most metabolically stressful and challenging times for a cow. It's critical to provide a quiet, clean and comfortable maternity pen, plus reduce environmental and social stresses.

In addition, Dr. Lucy explains that stress is a big factor in getting cows pregnant. "Traditionally, we always thought about the effects of stress on ovarian function. Whether or not the cow had started cycling and come into heat. But more recently, we're trying to understand specifically how stress affects uterine function and the preparation of the uterus for that pregnancy."

According to Dr. Lucy, it's important for producers to understand that reproduction starts in the dry cow pen. "Avoid the long-term drag on cows and take care of them in the transition pen."

We know that stressors can negatively impact fertility, so it's important to direct resources toward prevention and early detection. There are tools available to help monitor how cows are reacting to stress. For example, excessive weight loss in early lactation can be monitored via body condition scoring (BCS) and by new technology such as body weight camera imaging. Why is monitoring weight loss in early lactation important? A reduction in BCS in the first 30 days in milk can lead to decreased fertility and loss of conception. Find time to monitor weight loss in early lactation and use the data to make improvements.

5) Herd Health

Exposing a cow to unnecessary stress can increase susceptibility to diseases. Manage, prevent and treat early, said University of Manitoba animal science professor Dr. Meagan King during the RumiNation Podcast *Precision Technology to Monitor and Predict Animal Health* (Season 3, Episode 5). From subclinical ketosis to moderate lameness and mastitis, she recommends jumping on any problem early.

Dr. King's research has been looking at the impact of stressors on production, whether it is from lameness, overcrowding or feed delivery. She recommends using precision technology, such as rumination or activity tracking information, to look at behavior, help identify problems promptly and make better management and nutritional decisions to treat the problem.

Research also shows that supplying essential nutrients in a form that guarantees the right level is absorbed can help support a cow's health and metabolic well-being. For example, supplementing biotin has been proven to improve hoof health, while protected choline and B vitamins have been used to reduce clinical and subclinical ketosis.

Learn how stressors affect your cows

While there is no off switch for cow stress, shedding light on its complexities can help you manage stressors more easily.

Jefo Solutions are designed to help producers cope with everyday stressors and keep cows healthy and productive. Learn more at JefoDairyStressors.com, our educational resource center for research, articles, podcasts and more.

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