

Do not forget your Dry Cows during Heat Stress

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You have likely invested significantly in fans and cooling systems to minimize the negative effects of Heat Stress in your Lactating Herd. Have you also invested in their extra nutritional needs during Heat Stress? Have you invested the same for your dry cows?

Heat Stressed Dry cows will produce less milk in their next lactation. Over 200\$ per year was the estimate loss in a recent study (adapted from Ferreira et al., 2016). Furthermore, recent research has demonstrated impaired future development and performance of the heifer calves born of heat stressed Dry cows. How we treat Dry cows impacts its next lactation and the life-time profitability and well-being of their heifer calves.

Dairy cows will adapt to heat stress by modifying their metabolism resulting in an increased body heat loss and reduced heat production. A reduction in dry matter intake and a shift in glucose use to prioritize the immune system at the expense of, for example, milk production and reproduction will occur. It's part of your cow's way of adapting.

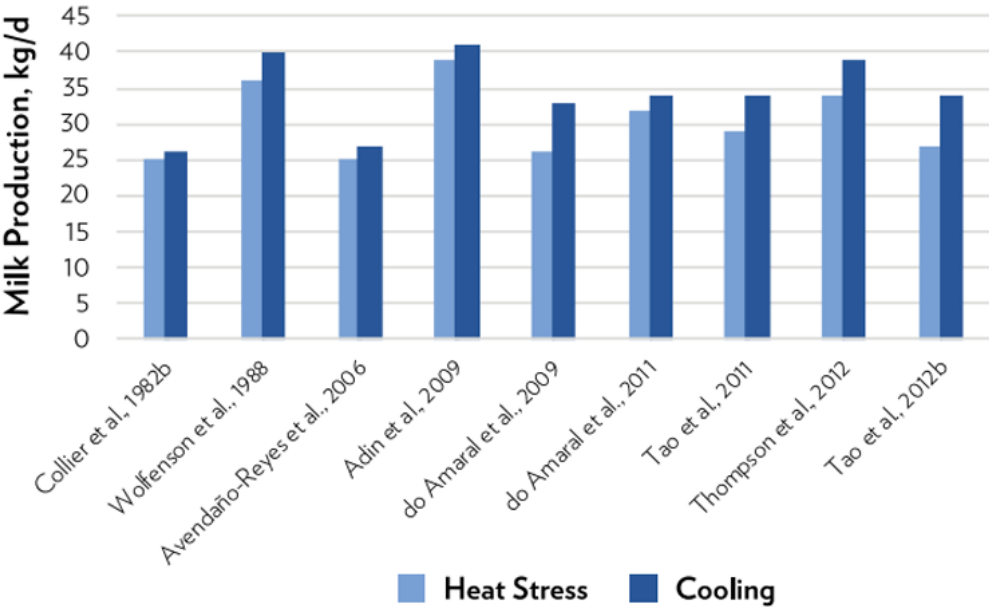


Figure 1. Effect of heat stress during the dry period on next milk production (Macko et al., 2017)

One of the negative impacts of heat stress on dry cows results in lower milk production during the next lactation period by upwards of 4 kg per day (Figure 1) (Tao et al. 2016; Macko et al., 2017). Why does this

happen? Lower pre-calving dry matter intake (upwards of 1.5 kg/day) and a compromised mammary gland development during the dry period (Tao et al. 2018) are the major reasons.

Furthermore, the Immune response pre and post-calving will be impaired when dry cows are heat stressed (do Amaral et al., 2011). This will create more health problems after calving, for example, subclinical ketosis is increased by 50% under heat stress (Figure 2).

NEGATIVE EFFECTS OF HEAT STRESSED DRY COWS ON THE NEXT GENERATION

Calves born from Heat Stressed dry cows will have lower immunity and reduced future milk and reproductive performance. Heat stress during late gestation will trigger hormonal changes at both the placenta and fetal level which will result in lower birth weight (Macko et al., 2017) and lower weight and height at 12 months of age. The mammary gland development of the fetus will be impaired and the future milk production of those first calf heifers will be reduced by as much as 5 kg per day (Dahl et al., 2016). These heifers will require more services per conception resulting in a significant delay in pregnancy.

WHAT CAN BE DONE TO REDUCE THE IMPACT OF HEAT STRESS DURING THE DRY COW PERIOD?

Dry Cows need cooling systems too. Your existing fans should be cleaned and maintained to ensure maximum cooling efficiency. Dust buildup of 1/8-inch (0.3 cm) on blades or shutters can reduce fan performance by as much as 30 percent, while loose belts can reduce efficiency a further 30%.

Reduce stocking density where possible to minimize stress and maximize lying and eating space. Ensure plenty of well positioned and clean waterers in your dry cow pens. Providing clean water along with nutritional changes to reduce the risk to the cow and fetus is essential. High dry matter intake and rumen health are always at higher risk during Heat Stress events.

Some Nutritional Strategies:

- Maintaining rumen function is crucial to the dry cow, especially during stress periods like heat stress.
- Make sure the ration has the right forage particle size, moisture, mixing homogeneity and delivering schedule and sequence to minimize sorting and empty bunks.
- Avoid heating and spoiling feeds. Heat increases the rate of growth of molds, which in turn create toxins. Ensure feeds remain cool and fresh.
- Feed a minimum 1 x per day, keeping feed well pushed up throughout the 24 hours.
- Feed nutrients to improve dry matter intake while meeting but not exceeding the specific needs of your dry cows is essential and should be fine-tuned in preparation for heat stress.
- Fine tuning dry cow diets with Rumen protected B vitamins

B VITAMIN SUPPLEMENTATION HAS SHOWN POSITIVE RESULTS TO LOWER THE NEGATIVE EFFECTS OF HEAT STRESS ON DRY COWS.

The supplementation of a specific rumen protected blend of B vitamins (choline, folic acid, B12 and riboflavin) before and after calving is part of the nutritional solution to reduce the negative impact of heat stress.

A recent study with multiple farms in Central Mexico during the summer demonstrated positive effects with a high return on investment. Supplemented dairy cows during the transition period were healthier: with 55%

less subclinical ketosis (Jefo Technical Research Report no 31, 2018) (Figure 2), 41% less retained placenta and 31% less metritis. Furthermore, the reproductive performance of those cows was significantly improved, along with increased milk production. (Jefo Technical Research Report no 29. 2017). A recently published Canadian study demonstrated that protected B Vitamins increases dry matter intake before calving and up to 4 weeks after calving (Morrison et al.,2018). This increase in dry matter intake during this crucial period would be beneficial to reduce the impact of heat stress.

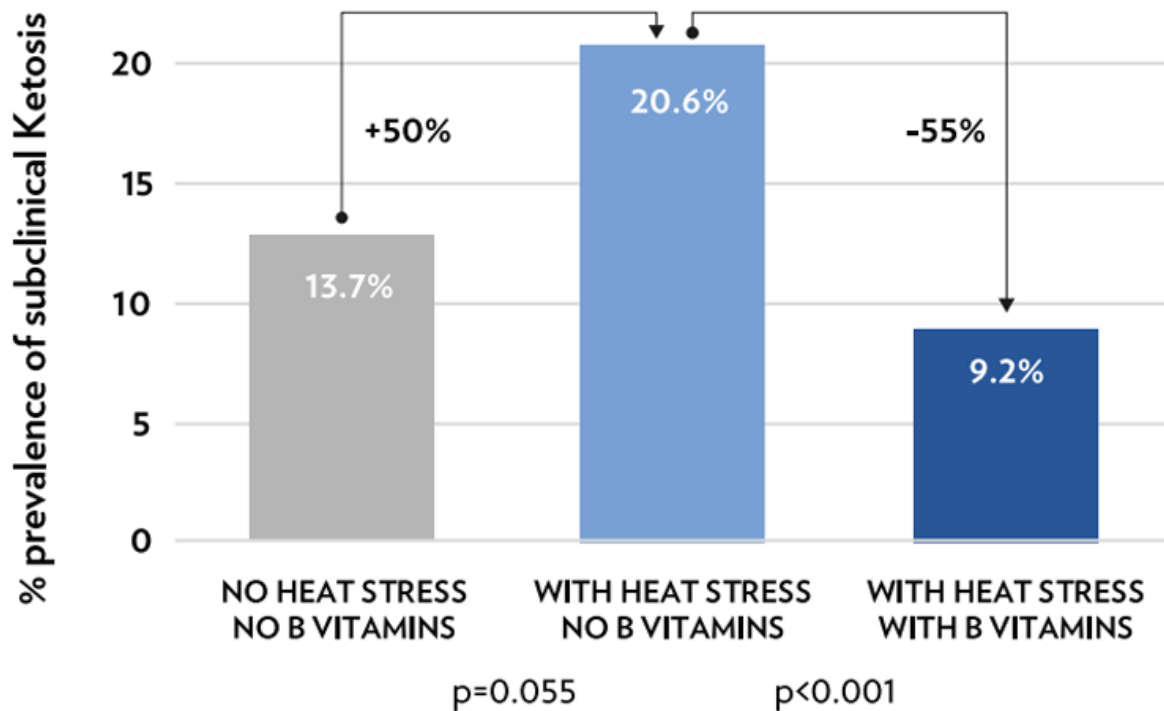


Figure 2. Effect of the dietary supplementation of a specific blend of protected B vitamins before and after calving during heat stress on the prevalence of subclinical ketosis (Jefo Technical Research Report no 31, 2018)

WHY B VITAMINS DURING HEAT STRESS?

B vitamins are essential nutrients, being enzyme cofactors with specific functions at the cellular level for the production of energy, the synthesis of protein and a healthy functioning immune response. For cows to efficiently breed back, B vitamins are required for both follicle development and early embryonic survival. Your herd's requirements for supplemental B vitamins increases during heat stress. The low and variable feed intake cows experience during hot weather impairs the rumen's ability to synthesize the large volume of B vitamins needed to maintain production, hoof health, immunity and reproduction.

TAKE HOME MESSAGE

- Heat stress during the dry cow period will impact negatively cow health and subsequent milk production and reproduction.

- Dairy calves born from cows suffering from heat stress in late pregnancy will have lower birth weight, reduced immunity and will produce less milk in their first lactation. Future reproductive performance will also be reduced.
- The reduced performance of the cow and her offspring will result in a loss of profit for the dairy producer.
- Supplementing a blend of protected B vitamins (Choline, Folic acid, B12 and Riboflavin) before and after calving was shown to be an innovative tool to provide ammunitions to your dairy cows to counteract the negative effects of heat stress impact on health, reproduction and milk production.
- The benefit of supplementing protected B vitamins during heat stress is even higher than under non stressful condition.



Since 1982, Jefo has provided solutions to meet the nutritional needs of the animal industry, based on applied research from its creative team of animal scientists, veterinarians and PhDs. Based in Ste. Hyacinthe, Que., Canada, it serves clients globally.