WRINKLE
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DakotaGold
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Heat Stress - How Dakota Gold Can Provide Benefits

Heat stress significantly impacts animal performance and profitability. In fact, research suggests that across the U.S., livestock producers lose between $1.69 and 2.36 billion each year for lower production, increased death loss, and negative effects on reproduction related to excessive heat (St-Pierre, et al., 2003). However, feeding co-products like Dakota Gold can help minimize some of these negative effects.

WHAT IS HEAT STRESS?

Animals have an optimal range of temperatures which we call the Thermal Neutral Zone (TNZ). When the combination of temperature and humidity (THI) exceed this upper range of the TNZ, we see negative effects on production, metabolism, and reproduction.

Figure 1 provides a diagram of how this relates to temperature changes throughout a typical day. During the evening hours, the temperature cools and animals don't experience negative effects. However, as temperatures rise and eventually exceed the THI Threshold, the heat starts to affect the animal.

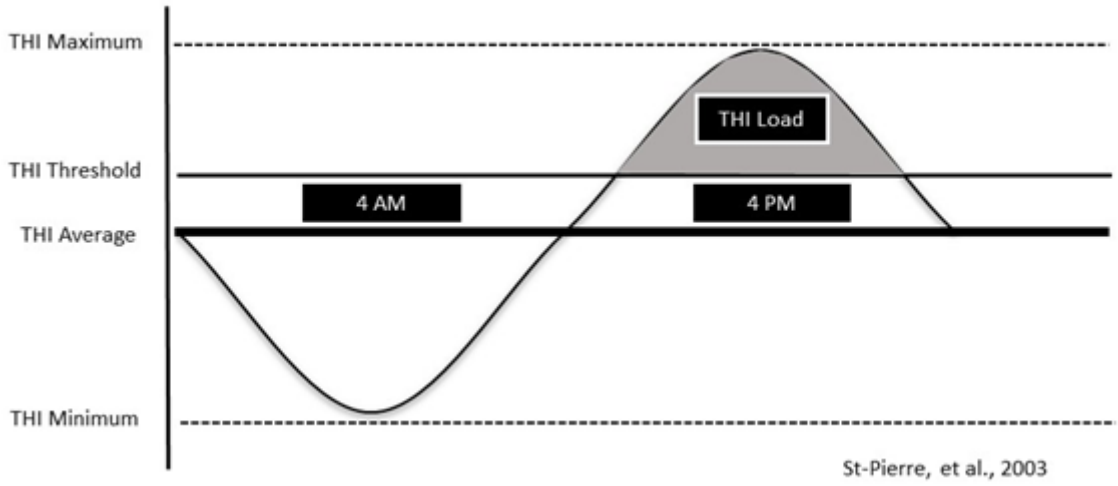

Figure 1. Heat stress effects throughout the day

WHAT AFFECTS HEAT STRESS RESPONSE IN ANIMALS?

Numerous factors can affect the intensity of heat stress. Environmental factors such as temperature and humidity play a critical role, but the amount of time exposed to excessive heat also contributes to the response. Furthermore, heat abatement strategies for facilities (fans, sprinklers) and changes in management can help to minimize some of the negative effects.

Livestock producers and nutritionists also try to minimize the effects of heat stress through diet formulation. The digestive process results in the production of energy, but it also results in the production of heat which contributes to the heat load of the animal. Certain ingredients result in less heat production than others and as a result, feeding these ingredients can minimize the amount of heat produced during the digestion process (Figure 2).

*These results are not a guarantee of nutritional value, as laboratory results are influenced by factors beyond the control of POET Nutrition.

DAKOTA GOLD BENEFITS ON HEAT STRESS

Dakota Gold helps to minimize the negative effects of heat stress through several different ways.

FEATURE	BENEFIT
Lower fiber compared with non-POET DDGS	Feeding less fiber for monogastrics means less heat production
Increased fiber digestibility of Dakota Gold	Greater fiber digestibility results in less heat produced
Composition of fiber in Dakota Gold	Helps maintain a healthy rumen - critical during periods of heat stress
Source of digestible amino acids	Improved digestibility helps to minimize amount of heat produced
Greater source of rumen undegradable protein	Balanced protein in ruminant diets results in less heat produced
Fiber and lower fat of Dakota Gold	Helps maintain components for dairy cows while simultaneously providing a good source of energy

Figure 2. Features and benefits of Dakota Gold in regards to heat stress

HEAT STRESS MANAGEMENT TIPS

- Provide clean water at all times
- Handle animals during the cooler times of the day
- Feed a correctly formulated diet
- Evaluate the use of feed additives or DCAD balancing
- Carefully observe animals for signs of heat stress
- Clean fans and sprayers
- Feed or mix multiple times a day to make sure feed remains fresh
- Consider the use of a feed preservative

SUMMARY

Heat stress represents a significant challenge for livestock producers across the world and as a result, many producers have invested in heat abatement strategies for their facilities and management. However, changes in diet formulation and selecting ingredients that contribute less heat can also help minimize the negative effects of heat stress.

Non-forage fiber sources such as Dakota Gold produce less heat during digestion than other less digestible fiber sources. This means that nutritionists can use Dakota Gold in their formulations to meet the nutritional requirements of the animal at a low cost while at the same time, reducing the amount of heat produced. This results in improved feed efficiency and profitability.

Dakota Gold's improved digestibility for both fiber and protein provide advantages compared with other ingredients. Knowing these characteristics will allow nutritionists to capture additional benefits when formulating diets during periods of heat stress.

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