OmniGen® AF

The Impact of Feeding OmniGen® AF to Dry Cows Heat Challenged with an Electric Heat Blanket Model

Background

The effects of heat stress on dairy cows have been well documented, with lower milk production in lactating animals (West, 2003) and lower milk yield during the following lactation in dry cows (Tao et al., 2011).

Feeding OmniGen® AF (OMN) during the dry period has been shown to help alleviate the negative effects of heat stress on subsequent performance. Fabris et al. (2017a) demonstrated a 10 lb milk/day production loss in cows that were heat stressed during the dry period but cooled during lactation using fans and soakers. When OMN was fed, beginning in late lactation through the entire dry period under heat stress conditions and early lactation, there was no loss in milk production. The alleviation of negative impacts of heat stress on subsequent lactation production may be partially explained by the greater number of alveoli found in the mammary gland of cows fed OMN under heat stress conditions compared to the cows that were not fed OMN but were experiencing heat stress (Fabris et al., 2017b).

Study: Electric Blanket Study

This study represented a different approach to assessing heat stress responses, specifically, using controlled electric heat blankets (EB) that can individually heat challenge an animal regardless of ambient conditions (Al-Qiasi et al., 2019).

Fifty multiparous Holstein cows, housed in individual tie-stalls, were fed a top-dress with or without 56 g/d OMN and either exposed to heat stress (HT) conditions using EB or ambient cool (CL) conditions, resulting in four treatments. Treatments began at the start of the dry period and continued until calving.

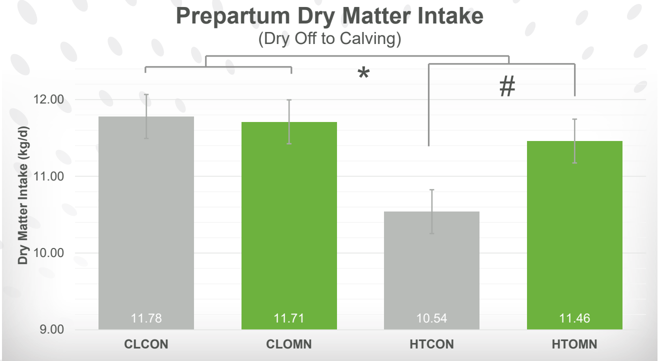
- Treatment 1: no EB + No OMN (CLCON, n = 13)
- Treatment 2: no EB + 56 g/d OMN (CLOMN, n = 12)
- Treatment 3: EB + No OMN (HTCON, n = 13)
- Treatment 4: EB + 56 g/d OMN (HTOMN, n = 12)

After calving, all cows entered the general milking group, housed in a sand-bedded freestall barn, and fed the same lactation diet. During lactation, cows were provided with mechanical cooling whenever environmental conditions warranted it.

The EB induced a heat stress challenge, with a significant increase in rectal temperatures measured in cows (CL: 38.12 C vs HT: 38.38 C; $P < 0.001$). Respiration rates were also increased in cows wearing EB (CL: 37.36 bpm vs HT: 50.68 bpm; $P < 0.001$), however the average respiration rates did not exceed 60 breaths per minute for any treatment group. All EB cows also increased water consumption compared to CL cows (CL: 52.5 L/d vs HT: 57.9 L/d; $P = 0.01$).

Prepartum DMI was decreased in EB cows compared with CL cows ($P = 0.04$; Figure 1). However, within the EB treatment groups, cows fed OMN tended to have greater DMI compared to the CON cows experiencing a heat stress challenge ($P = 0.07$).

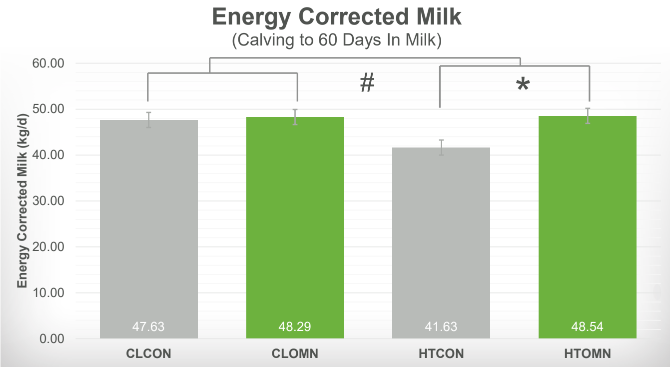
Figure 1. Prepartum Dry Matter Intake



Overall means: CLCON = 11.78 ± 0.35; HTCON = 10.54 ± 0.37; CLOMN = 11.71 ± 0.33; and HTOMN = 11.46 ± 0.33 kg/day. | CL vs HT *($P = 0.04$), HTCON vs HTOMN #($P = 0.07$). | Source: PHIBRO-JDE-424289.

Energy-corrected milk (ECM) tended to be reduced in cows exposed to heat stress conditions when compared to cool cows (*P* = 0.07). However, within the EB groups, cows fed OMN had greater ECM compared to the control cows (*P* = 0.04; Figure 2), with results similar to CL cows. These results demonstrate that cows fed OMN did not experience the negative effects of heat stress during the dry period on ECM compared to cows not fed OMN.

Figure 2. Energy Corrected Milk



Overall means: CLCON = 47.63 ± 3.04; HTCON = 41.63 ± 3.30; CLOMN = 48.29 ± 3.08; and HTOMN = 48.54 ± 2.96 kg. | CL x HT #(*P* = 0.07), HTCON X HTOMN *(*P* = 0.04). | Source: PHIBRO-JDE-424289.

Fabris et al. (2017a) reported on the production benefits and health responses of cows fed OmniGen AF, starting in late lactation and continuing through the fresh period of the next lactation, and heat challenged during the dry period. The current study reported results in cows fed OmniGen AF beginning at the time of the heat stress challenge at dry off and ending both OmniGen AF supplementation and heat challenge at calving.

Based on this research, feeding OmniGen AF at the time of dry-off when there is a heat challenge can help alleviate the negative effects of heat stress, minimizing the loss of prepartum DMI and milk production in the subsequent lactation.

References

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This information has been prepared for industry technical professionals.