Seasonal effects on preweaned calves in the Southeastern United States

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Preweaned calves are quite susceptible to environmental conditions for several reasons, Their surface to body weight ratio is the greatest it will be in their lifetime. They have a nascent ability to regulate their body temperature. And their housing varies considerably. Within the last 2 years, I have reviewed four studies done with heat stress in dairy calves (Kertz 2023a,b; 2024a.b). Recently, a major analysis of calf studies done at the University of Georgia—Tifton Dairy Research Center was reported (Roper et al., 2025). "The aim of this study was to investigate the seasonal effects on growth, apparent total-tract nutrient digestibility, and metabolic responses of preweaning dairy calves born and raised in either the summer or winter in Georgia."

"The same experimental procedure was followed during both the summer and winter months. The summer months included calves born from June through August 2018 and the winter months included calves born from November 2018 through January 2019. Holstein calves (n = 96, 48 per season; summer: 23 heifers and 25 bulls; winter: 21 heifers and 27 bulls) were separated from their dams within 6 hours after birth, navel-dipped with 7% tincture of iodine and fed colostrum replacer containing at least 200 g of IgG (Day of birth was considered as 1 day of age (DOA)). Calf management followed the protocols of the dairy research center. All calves were housed in outdoor individual polyethylene hutches with no additional shade. Calves were bedded with sand, which was cleaned daily and replaced weekly."

Calves were fed 1.43 lb of DM/day of a milk replacer (MR) containing 26% CP and 17% fat twice daily (0700 and 1600 hours) from 2 to 7 DOA. At 8 DOA, calves were randomly assigned to one of the 4 treatments in a 2 × 2 factorial arrangement including 2 feeding rates (1.43 or 1.61 lb of DM/day of the 26:17 MR) and 2 feeding frequencies (2× at 0700, and 1600 hours or 3× at 0700, 1600, and 2200 hours; Orellana Rivas et al., 2022a). The MR was medicated with 96 mg/kg lasalocid and provided (DM basis) 27.98% CP and 19.01% fat during summer and 26.22% CP and 18.37% fat during winter. Calves were fed MR via bottles initially and bucket trained at 5 DOA. When being reconstituted, MR was mixed with warm water (≈44°C) to 12.5% solids. From 43 to 49 DOA, the daily MR allowance was reduced by half and only offered 1× (0700 hours) for all calves.

Water and calf starter (CS) grain were offered ad libitum beginning at 2 DOA. During summer, the CS (DM basis) contained 17.77% CP, 19.47% NDF determined using amylase and corrected for ash (aNDFom), and 3.04 Mcal/kg ME; during winter, the CS (DM basis) contained 18.43% CP, 18.09% aNDFom, and 3.02 Mcal/kg ME. Calves remained in the experiment until 63 DOA.

Average daily ambient temperature and relative humidity were 80.6°F ± 4.6°F and 83.4% ± 7.6% during the summer months and 55.1°F ± 8.1°F and 81.5% ± 15.2% during the winter (**Figure 1**).

Figure 1.

- Several references were cited that temperatures over 68°F (20°C) increased calf respiration rate. Thus, calves raised during summer months experienced heat stress (NASEM 2021, NRC 2001).
- Even at night the temperature at this southern Georgia calf site mostly above heat stress.
- During winter months the range of temperatures was greater than during summer. And the upper temperature during winter was often above heat stress.

Rectal temperatures and respiration rates followed a similar pattern in that each ws greater in summer than winter (**Figure 2**).

F**igure 2.**

Calves during the summer initially ate less MR but after week 2, they ate more MR than in winter. There was no difference in starter intake during winter and summer.

The Bottom Line

Feeding a meal calf starter with 58% corn and 5% chopped alfalfa hay resulted in poor calf performance prior to weaning. Using ground untreated corn or two different heat-processed corn in this study made little difference. Grinding or processing corn and including chopped alfalfa hay requires time, labor, equipment, and more costs versus feeding a well-texturized calf starter which provides better intake, daily gain, and rumen development.

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