

ABSTRACT

Forty-eight cows were assigned randomly to shade (15 Holsteins, 8 Jerseys) or no shade (16 Holsteins, 9 Jerseys) for 102 days beginning 12 June 1977 to examine effects of solar heat load on milk yield and composition. Rectal temperatures, respiration rates, and rumen contractions/min were monitored between 1200 and 1700 h on 20 randomly selected days. Morning and evening milk weights were recorded daily. Once weekly, morning and evening milk samples were collected from each cow and analyzed for fat, protein, acidity, freezing point depression, and somatic cell number. Black Globe temperature, rectal temperature, and respiration rate were elevated in no shade 38.8°C, 39.6°C, and 114.8/min from 30.1°C, 38.7°C, and 78.5/min. Afternoon Black Globe temperatures had little effect on morning or evening milk yield of the same day, whereas Black Globe temperatures 24 and 48 h prior were associated with depressed yield. Milk composition did not differ between shade and no shade cows. However, freezing point depression and fat were greater in evening milk in both shade and no shade cows, and treatment interacted with time so that evening milk contained less water per unit solids, and this was more pronounced in no shade cows. Benefit of shade is in reducing total heat load while preserving sensible avenues of heat loss. Time delay of temperature effects in milk yield indicates that reduced feed intake and possibly reduced rate of passage are major reasons for reduction in yield of milk.