Public Abstract
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Title: Effects of a commercial feed additive on production losses during acute heat stress conditions in mid-lactation Holstein dairy cows

Heat stress occurs when the environmental temperature exceeds the thermoneutral zone (or comfort zone) of the dairy cow, necessitating the employment of energetically costly cooling mechanisms such as sweating and panting. Heat-stressed dairy cattle experienced reduced milk production and milk quality, decreased dry matter intake (DMI), and an increased incidence of health problems. Ultimately this costs the US dairy industry approximately $1 billion per year in lost revenue. As a result, identifying nutritional strategies that target these production losses is of paramount importance to the industry. In this experiment we evaluated the ability of the commercial feed additive Rally® to mitigate production losses during heat stress. In order to simulate heat stress conditions, forty-eight mid-lactation dairy cows were housed in temperature-controlled environmental chambers where daily cyclical temperatures ranged from 23.8 to 30.2°C, with a temperature-humidity index of 69.2 to 75.5 (designed to mimic normal daily variation during a typical summer day). Milk yield and DMI were recorded daily. Blood samples were collected twice weekly in order to examine the plasma nonesterified fatty acids, products formed from the breakdown of body fat. Ultimately, we found that Rally® supplementation increased DMI and milk yield, and decreased the plasma concentration of nonesterified fatty acids. These decreased plasma nonesterified fatty acid concentrations indicate that the cows were in a more favorable energy balance as they were not mobilizing as much fat from body reserves in order to meet their energy needs. Thus, during periods of heat stress, the inclusion of Rally® in the diet has the ability to both increase milk production as well as improve feed intake. Overall, Rally® supplementation during heat stress may help avoid lost revenue as well as promote cow health.