Ambient temperature and its effect on performance and udder health

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Prolonged periods of high ambient temperatures, particularly in connection with high humidity, not only affect the farms' production resources but may also have a direct impact on dairy cows. Rising ambient temperatures result in problems with regard to the regulation of the internal body temperature as the cows' ability to dissipate body heat is reduced. In high-yielding cows this effect is additionally enhanced due to higher metabolic activity. Certain construction and husbandry measures in dairy cattle farms may however alleviate the negative effect of high ambient temperature and humidity. Thus, data of the husbandry system (barn type tie stall/loose housing; forced ventilation yes/no; pasture yes/no) were collected in 150 Austrian dairy cattle farms covering the breeds Fleckvieh, Brown Swiss and Holstein (Projects StartClim2014.C and EfficientCow). Those data were merged with performance data from the central cattle data base and meteorological data from the Central Institute for Meteorology and Geodynamics. The effect of temperature (average of the maximum temperature and temperature-humidity-index, THI, up to and including three days before performance testing) on dairy performance traits (milk yield, fat and protein content) and udder health (Somatic cell score, SCS) was analyzed excluding and including husbandry systems. Taking husbandry system not into account, performance traits were significantly negatively affected by higher temperatures and higher THI while no effect on SCS was observed. However, including the husbandry system, significant but varying effects of temperature and THI within husbandry systems were found for SCS as well. Particularly with regard to the expected increase of days with high ambient temperature, the results illustrate the necessity to reduce dairy cows' heat stress in specific husbandry systems.

Evaluating climate change through month of calving effect on milk yield of dairy cattle

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Climate change is becoming a global concern. The specific objective of this study was to identify a biological method to quantify climate change effects. The effect of month of calving on dairy cattle milk yield in subsequent years could be a reliable indicator of climate change quantification. Milk data of Friesian dairy cattle, raised under South Mediterranean production conditions and recorded during two periods (1983-1987) with 74,201 lactations from 327 herds and (1998-2009) with 25,000 lactations from 156 herds were used in this study. In the first period, cows were North American Holsteins (2%), European Friesian (28%) and their progeny born and raised in Tunisia (70%). In the second period North American sired cows were (19%) and European sired cows were (14%). Statistical analyses of collected data identified significant sources of variation by region, herd-year within region countries of origin, month of calving and days in milk for dairy cattle milk yield. The effect of month of calving on milk yield was quantified by the least squares solutions obtained with the last month restricted to zero. In both periods, cows calving in the fall and early winter (September-January) yielded more milk than cows calving in spring (February-May) or summer (June-August). In the first period, cows calving in January yielded 384 kg more milk than cows calving in August. In the second period, the difference between January and August was reduced to be only 220 kg. Least squares means differences of milk yield from January to December (as a basis of comparison) were, respectively, in the first period (113, -34, -76, -100, -189, -238, -246, -271, -160, 7, 35 and 0 kg). These differences were, respectively, in the second period (-47, 6, -30, -86, -203, -226, -267, -268, -177, -76, -47 and 0 kg). Differences among month of calving effects on milk yield within periods showed a similar trend. However, differences in the second period showed a clean tendency of a decrease in differences between months especially between what is known in the first period (1983-1987) as traditional cool months and hot months which might be a climate change translation.