

Effects of heat stress on milk yield in Sardinian dairy sheep farms

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ABSTRACT

The effects of heat stress on milk production of dairy ewes have been very little studied, especially under Mediterranean conditions. For this reason, such effects were studied in ten Sarda dairy sheep farms associated to the Sardinian Breeders Association, located throughout Sardinia. They had whole farm milk yield records registered every 48 hours from April 1st until July 15th, in the years 2003 and 2004. Meteorological data were obtained from data collected by meteorological stations of the Weather Forecast Service of Sardinia located near each farm. To determine the effects of meteorological conditions on milk yield, analysis of variance using the SAS (SAS Institute Inc., Cary, NC, USA) mixed procedure was performed. The results showed that Sarda dairy sheep were highly sensitive to high temperatures, especially when they persisted for long periods. All analysed meteorological factors, except for wind speed, significantly influenced milk yield. Milk yield was more influenced by minimum air temperatures than by any other meteorological parameter. Increases in minimum temperatures from the optimal range of 9-12 °C up to 27-30 °C caused on average a decrease in milk yield of 36% (0.35 kg/d per head). The highest milk yields were observed at maximum air temperatures ranging from 24 to 30 °C and at mean temperatures varying from 15 to 18 °C, with progressive decreases, up to 20% (about 0.22 kg/d per head), at higher temperatures. The effects of duration of temperatures higher than some threshold values on milk yield were also relevant. Optimal air relative humidity for milk production was between 65 and 75%, in accordance with values reported in the literature. Rainfall negatively influenced milk yield, probably because it disturbs grazing, with decreases up to 23% (0.20 kg/d per head) under conditions of 6 mm-cumulative rainfall in two days. Milk production was also influenced by Temperature Humidity Index (THI), with a decrement of 25% (0.23 kg/d per head) as THI increased from 60-65 to 72-75. Wind influenced milk yield only when associated with other meteorological factors; it alleviated the negative effects of heat stress on milk yield at higher speed values. In conclusion, despite of their small body size, which should favour heat exchange and thermoregulation, milk yield of Sarda ewes was markedly reduced by heat stress.

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