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## Effects of high air temperatures on milk efficiency in dairy COWS

J. Brouček, Š. Mihina, Š. Ryba, P. Tongel, P. Kišac, M. Uhrinčať, A. Hanus

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26 herds with 71 586 individual records were used. We tested a hypothesis that milk efficiency was influenced by the elevation of the farm, housing system, breed, area of altitude, and by the cooling of dairy cows. There were 20 herds from lowlands and 6 herds from mountains, 20 herds from free-stall housing, 6 herds from tie-stall housing. 8 herds consisted of Slovakian Pied cattle, 4 herds of Red Holstein cattle, 11 herds of Black-Pied Lowland cattle and 3 herds of Slovakian Pinzgau cattle. The herds were divided into 4 groups according to the nearest meteorological station, and they were distributed according to the type of cooling. 10 herds were cooled by misting, 16 herds by fans. We recorded from 96 to 117 summer days and from 49 to 63 tropical days in lowlands for this summer period. Ninety days with temperature-humidity index (THI) above 72.0 were found in the lowest-elevation area. During 55 days we recorded the values higher than 78.0. Production of milk was higher in lowlands than in mountains (8 761.4 kg vs. 6 372.0 kg;  $P < 0.01$ ). Differences were also recorded in the evaluation of fat and protein production (346.0 kg vs. 275.9 kg;  $P < 0.01$ ; 282.6 kg vs. 205.9 kg;  $P < 0.001$ ). Milk and protein production was higher in free-stall housing than in tie-stall housing (8 656.3 kg vs. 6 722.1 kg;  $P < 0.05$ ; 278.7 kg vs. 218.9 kg;  $P < 0.05$ ). The highest milk production was recorded in Black-Pied Lowland cattle (8 832.7 kg) and the lowest in dairy cows of Slovakian Pinzgau cattle (6 058.0 kg). The mist cooling of dairy cows increased ( $P < 0.05$ ) the amount of produced milk and protein (9 234.4 kg vs. 7 569.7 kg; 293.5 kg vs. 247.1 kg).

**Keywords:**

dairy cows; milk production; milk composition; high air temperatures; elevation; housing; breed; cooling

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