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ABSTRACT BOOK

OP29-3 | Floor cooling for growing finishing pigs during warm conditions – impact on pig hygiene, thermal and gaseous environment

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The changing climate, with higher temperatures, is challenging pigs' abilities to lose metabolic heat. This study was conducted during two summers (2022 and 2023) on a commercial pig farm in Sweden, latitude 59.7°N, using a change over design. In one pig unit the solid floorings, in partly slatted pens (8.96 m², solid lying area 71% and slatted dunging area 29%), were cooled whilst the solid floorings in the adjacent pig unit had no cooling. Each pig unit had 38 pens with 9-10 pigs/pen (LYxH, mixed sexes, ~35-115 kg, undocked). Cooling was conducted by circulating chilled water (~11°C) in the waterborne pipes casted in the concrete. Concentrations of ammonia (NH₃) and carbon dioxide (CO₂) were measured with a photoacoustic gas monitor 1512 and a multipoint sampler 1409 (Lumasense Technologies A/S, Denmark) above four focal pens/pig unit, in addition to sampling points by one air inlet and by one exhaust fan in each unit. Temperature and relative humidity were continuously registered with loggers (Gemini Data Loggers Ltd., UK) mounted next to the sampling points of NH₃ and CO₂, and close to the lying area in the focal pens. Pig hygiene was assessed according to a protocol developed based on literature. Statistical analyses were performed using PROC GLM in SAS version 9.4. Preliminary results show that the proportion of pigs with the mildest hygiene score (<20 % of the body dirty) were higher in cooled compared to control pens (on average 44.6±1.30 vs. 28.8±1.03 % of pigs in the pen (LSM±SE), p<0.001). In accordance, the corresponding proportion of pigs with the most severe hygiene score (>50 % of the body dirty) were lower in cooled pens compared to control (on average 31.8±1.37 vs. 47.9±1.37 % of pigs in the pen (LSM±SE), p<0.001). In addition, the results show lower levels of both NH₃ and CO₂ with floor cooling compared to the control (2.9±0.03 vs 4.0±0.03 ppm NH₃ and 1345±3.9 vs 1376±3.9 ppm CO₂ (LSM±SE), p<0.001 for both). The average temperature was lower in the unit with cooled floor treatment compared to control, both in the sample points above the pen (20.7±0.03 vs. 21.2±0.03 °C (LSM±SE), p<0.001) and closer to the floor in the lying area (26.3±0.06 vs. 27.7±0.07 °C (LSM±SE), p<0.001) while there were no significant differences in relative humidity between treatments. The results indicate a favourable effect of floor cooling on pig hygiene, thermal and gaseous environment.

swine, heat stress, indoor environment, cleanliness



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