Variation of a temperature-humidity index in the truck transporting sows to slaughter

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The welfare of sows can be affected by climatic conditions. A temperature-humidity index (THI) is commonly used as an indicator of heat stress for cattle, sheep, horses, and more recently for sows. Until now, climatic conditions in the truck transporting sows to slaughter have not been studied. Our objective was to determine variation in THI in trucks during transportation of sows to slaughter. We hypothesized that THI increased during transport and even more during the waiting time at the slaughterhouse.
The temperature (T, °C) and relative humidity (HR, %) were recorded every minute (min) during 41 trips distributed over one year, where sows were transported from farms to slaughter by commercial vehicles and kept there at commercial stocking density. Transport duration varied between 30 and 470 min. The THI was calculated using the NWSCR (1976) formula, previously used on data from sows (Wegner et al. 2014, 2016): THI = [(1.8 * T) + 32] – [0.55 * (RH/100)] * [((1.8 * T) + 32) – 58]. For the statistical analysis, data were divided into two periods: the “TRIP period” covering the interval from entering the trucks until the trucks arrived at the slaughterhouse, and the “WAIT period” covering the interval from arrival at the slaughterhouse until the last sow has been unloaded. A linear mixed model, using time and season as fixed effects and the trip number as random, was applied on the THI data. A t-test was used to compare the THI at different time points during the transports.
For the TRIP period, the results indicated that THI increased in the first 100 min ($P = 0.03$), and was stable from 100 to 200 min ($P = 0.71$). During the first 30 min of the WAIT period, THI tended to increase ($P = 0.06$). For both periods, the THI was higher during summer compared with the other 3 seasons (THI = 65.6 ± 1.5 in summer vs. 52.7 ± 1.4 winter during TRIP period, THI = 68.2 ± 2.1 in summer vs. 54.8 ± 1.8 winter during WAIT period). THI was also higher during the WAIT period (from 20 to 30 min) compared with the last 10 min of the TRIP period (60 vs. 58, $P < 0.01$).
To conclude, THI in the trucks varied during transport of the sows to slaughter. THI mainly increased during the first 100 min of the trip. Hence prolonging trip to a duration beyond 100 min did not seem to affect the truck climatic conditions. The waiting time at the slaughterhouse prior to unloading resulted in increased THI, and may have had negative welfare consequences for the sows, especially during summer where the THI was already high. Future studies should focus on this phase of sow transport. In the current project, the next steps will be to analyze effects of pauses during transport, both numbers and duration, on THI during the TRIP period.