

MEAT QUALITY OF PIGS TRANSPORTED TO SLAUGHTER USING TWO NOVEL TRAILER DESIGNS VERSUS A STANDARD POT-BELLY TRAILER UNDER CANADIAN CONDITIONS

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Background: Transportation is one of the most stressful events a pig experiences and results in direct financial loss (Faucitano and Goumon, 2017; Ritter *et al.*, 2009). The North American pot-belly (PB) trailer is reported to increase animal losses and meat quality defects (Correa *et al.*, 2013; Peterson *et al.*, 2017; Ritter *et al.*, 2009) due to steep internal ramps and inadequate ventilation, especially when the vehicle is stationary (Conte *et al.*, 2015; Marchant-Forde and Marchant-Forde, 2009). Flat-decked trailers featuring hydraulic decks (no ramps) improve handling ease resulting in a lower proportion of dead-on-arrivals and decreased physiological stress response compared to PB trailers (Faucitano, 2018). In summer transports, the use of trailer designs featuring fan-assisted ventilation and water misting may improve the thermal comfort of pigs reducing animal losses (Pereira *et al.*, 2018). This study evaluated and compared the bottom-front (BF), middle (MM), and top-rear (TR) compartments of two novel trailer designs featuring fan-assisted ventilation and water misters, a modified pot-belly (MPB) and an Italian flat-decked trailer (PEZZ), against the PB trailer on *longissimus* (LM), *semimembranosus* (SM), and *adductor* (AD) muscle ultimate pH (pHu) and drip loss of pigs during short transport (1h30) under Canadian summer and winter conditions.

Results: The quality of the LM was influenced by the trailer type*season and compartment*season interaction, with the pHu value tending to be lower in pigs transported in the MPB compared to those transported in the PEZZ trailer during winter ($P = 0.06$) and drip loss was lower (less exudative) in pigs shipped in the BF compared to the MM compartment (1.45 vs. 1.9 %) during summer ($P = 0.04$), regardless of trailer type. The pHu of the SM and AD muscles was lower in pigs transported in the MM compared to those transported in the TR compartment of the PB trailer during summer ($P = 0.02$ and $P = 0.04$, respectively). A lower pHu value was found in the AD muscle of pigs transported in the PB trailer BF compared to the TR compartment during winter ($P = 0.01$).

Discussion and conclusion: The results of this study indicate the negative effect of the compartment location within trailer on meat quality. Low deck height may explain the reduced meat quality in pigs transported in the MM and BF compartments respectively, within the PB trailer. The shared result of the BF compartment on pork exudation between all trailers, perhaps due to low deck height impeding sufficient airflow and handling ease, indicates that this compartment should be redesigned. Both seasons had an impact on meat quality variation, therefore improving these specific compartment microclimates could improve meat quality.

Take home message: Specific trailer compartments need to be redesigned to improve meat quality of market-hogs during short summer and winter transports.