Effects of Long Distance Transport on the Health and Welfare of Early Weaned Pigs

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Summary

During transport, piglets can experience numerous stressors, including feed and water deprivation, handling at loading and unloading, extreme temperatures, vibrations and noise. However, it is not known whether the combined impacts of weaning and transport overlap, are additive, or synergistic. The effects of long duration transports are of particular concern, but little research is available particularly under Canadian conditions. Research is needed on the effects of long transports, including food and water deprivation, on piglet welfare during and after transport. This research will aid greatly in identifying best practices for transport, provide a basis for transport policy, and direction for future study and improvement. Initial results on a study comparing long and short transport durations indicate there was no difference in mortality between the two groups.

Introduction

The North American swine industry relies heavily on the transport of weaned pigs. Approximately 120,000 iso-wean pigs born on Canadian farms are placed in US swine barns each week. The transport of weaned piglets across Canada, or into the US, involves travel durations ranging from one to 36 hours. The maximum acceptable transport time allowable for pigs without feed, water or rest in Canada is 28 hours (Canadian Health of Animals Regulation, C.R.C. 296) and was changed from the previous maximum of 36 hours in 2020. In the United States, the maximum limit is 28 hours (United States Department of Agriculture 49 U.S.C. 80502).

A greater understanding of the effects of long transports on weaned pigs is needed, including methods to mitigate any negative effects found. Weaning in itself is a stressful period for pigs due to separation from the sow, changes in diet, mixing with unfamiliar pigs, and introduction to a novel environment. Weaning even within a single site often results in piglets not consuming feed for >24 hours following weaning. Understanding how transport impacts the weaned pig and how this differs from weaning alone is important for improving animal welfare and economics of pork production.

Experimental Procedures

Experiment 1. Effects of long transport durations on weaner pigs

Piglets were transported under commercial conditions from two different locations in order to evaluate the effects of transport duration on their health and welfare. Transport treatments included short (~90 min) and long durations (~36 h) using a standard flat deck (short transport) and 4-deck pot-belly (long transport) trailers.

Various blood measures (cortisol, hematocrit, total protein, glucose and creatine kinase) were used as indicators of dehydration and stress before and after transport, in addition to recording body weight before, after and three days after transport. Pig behaviours (lying, standing, sitting and huddling) were recorded during transport by scan sampling using time-lapse photography inside trailer compartments. Trailer conditions including temperature, humidity and vibrations were monitored using iButton data loggers HOBO accelerometers. Piglet behaviour in the nursery was recorded following receipt using video cameras in daylight hours to observe aggression, postures, feeding and drinking behaviour. Piglet health including morbidity and mortality rates were monitored during the nursery period, up until the time of nursery exit (approx. 25 kg).

Experiment 2. Effects of providing electrolytes during transport on mitigating stress

Treatments for this phase of the study will include: 1) provision of water and electrolytes during transport; and 2) control pigs (no water or electrolytes). Data collection will take place in winter on short transports within Ontario using a flat deck trailer. Measures similar to experiment 1 will be taken, including piglet behavior monitoring, temperature and humidity measures inside the trailer. Body weight, lesions and lameness will be recorded at key time points and blood samples will be collected before and after transport. Following arrival, piglets will be kept in treatment groups within the nursery barn. Behaviour in the nursery will be monitored using live observations following receipt to observe aggression, postures, feeding and drinking. Growth performance will be recorded following arrival at the destination barn, and piglet morbidity and mortality will be monitored up until the time of nursery exit (approx. 25 kg).

Experiment 3. Evaluation of a hydraulic deck trailer design

This study will compare environmental conditions on a standard 4-deck pot-belly trailer to an alternative 4-deck hydraulic trailer, and measure their effects on piglets. Ten loads will be compared (five per trailer design) hauling weaners for a moderate duration (10 to 18 hrs) to a common nursery site.

Results and Discussion

Initial results indicate there was no difference in the risk of piglets being dead on arrival between short and long duration groups. Piglets undergoing short duration travel had higher odds of lameness observed at arrival compared to long. At arrival, piglets in the long duration group had biologically significant negative weight change from weight pre-transport. In this group, relatively heavy piglets lost more weight over the transport period than light piglets. No effect of duration was observed on net weight change from pre-transport to three days post-transport.

Implications

The results of Experiment 1 represent an essential component in understanding the effects of transport duration on piglet welfare and suggest that in these duration and temperature conditions, piglets were physiologically resilient to transport length. However, behavioural data collected during and following transit must be interpreted before final conclusions on welfare can be made.

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