Weaned piglet transport practices in Canada

H.R. Golightly[1], T.L. O'Sullivan[1], J.A. Brown[2] and Y.M. Seddon[3]

Hannah Golightly

Yolande Seddon

SUMMARY

The objective of this study was to describe characteristics of weaned piglet transport events that occurred between 2014 and 2018 using records provided by five Canadian swine companies. The dataset included records from 6203 transport events involving the transport of approximately 6.9 million piglets (4.1–7.9 kg) from 62 farm origin sites in Alberta, Ontario, or Saskatchewan, Canada. Most transport events ended at farms in Canada (71.3%), while the remaining transports delivered piglets to one of eight American states. The predominant trailer types used were Straightdeck (51.4%) and Potbelly (36.6%), but this did not reflect the number of piglets transported as Potbelly trailers have greater load capacity. Transport events most frequently involved loading piglets from one origin barn and delivering them to a single destination barn (78.1%). Only transport events involving export to the United States picked up piglets from, or delivered them to, more than one farm site. Most transport events had very short trip distances (median distance: 48.0 km; IQR: 497.0), but a large range in distances was observed (1.8–2931.2 km). Ambient temperature during these transport events ranged from -30.3–28.7 ◦C. Overall, less than 10% of transport events had mortality occur. The average in-transit mortality rate observed was 0.027%. However, instances of mortality over 1% did sporadically occur and could translate to considerable losses given the large load sizes common for piglets of this age (median load size: 1105 piglets; IQR: 1036 piglets). These data provide a better understanding of the interconnectedness of the Canadian swine industry as well as common transport practices which may inform future research on disease transmission in swine transport networks, and piglet welfare during transport.

INTRODUCTION

Canada's swine industry relies on transport of weaner pigs from sow herds to nursery farm sites. This practice helps to minimize disease transfer to piglets and allows for sow herds to be located in more biosecure regions, with grower pig farms located closer to feed supplies and packer facilities. Canadian transport practices for shipments of newly weaned piglets are not well-described despite documentation requirements for those transporting animals. This documentation is not available for public access. Other sources of data available on weaned piglet transport in Canada include production and export records provided by government agencies. These data are aggregated by province and pig production class and are limited in terms of the information they provide related to transport event characteristics. As such, a significant gap exists when characterizing weaned piglet transport practices in Canada. Information on weaned piglet transport practices beyond what is currently available is valuable for understanding the interconnectedness of the Canadian swine industry. Information such as frequency in which multiple barns are loaded from by one truck, trip duration, average weight of piglets at transport, etc. can help assess research findings pertaining to transport practices on piglet welfare. Documenting what trip durations, load sizes, and trailer types are commonly used would be highly valuable in informing what conditions should be captured in future experimental studies. Finally, this information can inform disease spread models. Therefore, the objective of this retrospective observational study was to describe the characteristics of transport events involving piglets at or near the time of weaning using Canadian transport record data provided by industry partners.

This work has been published in Preventive Veterinary Medicine 216 (2023), 105931.

1 Department of Population Medicine, Ontario Veterinary College, University of Guelph, 50 Stone Rd E, Guelph, ON N1G 2W1
2 Prairie Swine Centre Inc, PO Box 21057, 2105 – 8th Street East, Saskatoon, SK S7H 5N9
3 Department of Large Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, 52 Campus Drive, Saskatoon, SK S7N 5B4

EXPERIMENTAL PROCEDURES

Weaned piglet transport records collected between 2013 and 2018 (n = 8891) were voluntarily provided in electronic or paper format by five Canadian companies conducting weaned piglet transport events. These five companies included three production companies (an integrator, a cooperative, and a stand-alone company) and two livestock transport companies moving piglets for private farms. Following data validation, 6692 records remained for analysis. The existing information provided was used to match additional information to each company's dataset (trip distance, departure temperature, arrival temperature), calculate additional parameters (average piglet weight, estimated trip duration, in-transit mortality) and generate categorical variables (multiple origin barns, border crossing, multiple destination barns). The dataset then underwent further cleaning including removal of transport records where average piglet weights were less than or greater than what would reasonably be classified as a piglet at the time of weaning (21 days of age). The final dataset contained 6203 transport events representing a total of roughly 6.9 million piglets transported between 2014 and 2018.

RESULTS AND DISCUSSION

The proportion of piglets transported in this dataset accounts for approximately 6.8%, 29.0%, and 5.9% of piglets estimated to have been weaned on Ontario, Saskatchewan, and Alberta farms, respectively, and approximately 4.7% of piglets estimated to be weaned in all of Canada between these years.

The transport events recorded during the study period involved three Canadian provinces and eight American states. The mean average weight of the transported piglets was 5.7 kg (SD: 0.5 kg, range: 4.1–7.9 kg). Most transport events (71.3%) and piglets (59.4%) were transported within Canada. The median trip distance for transports within Canada was 30 km, and the maximum trip duration was 10.4 hours.

A total of 1781 trips (28.7%) were export events to the USA. For those trips, the median trip distance was 1561.6 km and the maximum trip duration was 32.6 hours. Of the export shipments, the three states receiving the greatest number of transport events were Michigan (33.6%), Iowa (33.0%) and Indiana (12.5%), while the three states receiving the greatest number of piglets were Iowa (46.1%), Michigan (20.3%) and Minnesota (16.8%).

The median average daily temperature recorded at the departure locations was 9.1 ◦C (IQR: 18.5), ranging from -30.3 – 28.5 ◦C. The median average daily temperature recorded at the arrival locations in this dataset was 10.3 ◦C (IQR: 18.2), ranging from -30.3 – 28.7 ◦C.

Transport events with ≥1 piglet recorded to have been found dead on arrival represented 8.3% (n = 513) of all records in this dataset. In-transit mortality rate, defined as the percent of piglets shipped during the transport event that were recorded to have died during transport, ranged from zero to 6.16%, with a mean of 0.027%. Trip characteristics of the transport events with the ten highest recorded mortality rates are presented in Table 1.

IMPLICATIONS

This dataset provides valuable information on features of Canadian weaned piglet transport, thus offering insight on the implications of changing legislation and the relevance of conditions captured in previous experimental research. The presented data can also inform parameters used in models of disease spread in the Canadian swine industry, such as ranges of distances between origin and destination farms, numbers of piglets transported, and the frequency of multiple farm contacts in a single transport event.

ACKNOWLEDGEMENTS

This research was funded by the Saskatchewan Ministry of Agriculture, through the Agriculture Development Fund (ADF) [project #20160301], with core funding support from Alberta Pork, Manitoba Pork Council, and the Saskatchewan Pork Development Board. Funding was also provided by Swine Innovation Porc, Agriculture and Agri-Food Canada, provincial producer organizations and industry partners including Alberta Pork, Les Eleveurs de Porc du Quebec, Manitoba Pork, New Brunswick Pork, Ontario Pork, PEI Pork, and Sask Pork, within the Swine Cluster 3 research program [grant #17127]. The authors gratefully acknowledge the companies who provided the records for this research, the company representatives who assisted with the data, and those involved in record compiling, cleaning, and validation, including Hauwa Bwala, Ewen McCairns, and Enise DeCaluwe-Tulk.

Table 1. Characteristics of transport events with the ten highest mortality rates out of 6203 transport events between 2014 and 2018.

Mortality rate, %	No. piglets dead	Year	Month	Load size	Trailer type	Trip distance, km	Multiple pick-ups	Export event	Multiple drop-offs
6.16	157	2014	April	2548	Potbelly	2,043	Yes	Yes	Yes
4.73	57	2016	August	1206	Unclassified	1,650	No	Yes	No
4.04	35	2015	April	866	Straightdeck	90	No	No	No
3.82	96	2016	December	2515	Potbelly	1,787	Yes	Yes	No
3.56	89	2017	January	2500	Potbelly	1,641	No	Yes	No
3.28	82	2014	October	2500	Potbelly	1,795	Yes	Yes	No
3.04	78	2016	March	2565	Potbelly	1,688	No	Yes	No
2.79	67	2017	February	2400	Potbelly	1,929	No	Yes	No
2.76	70	2015	May	2540	Potbelly	2,166	Yes	Yes	Yes
2.52	63	2016	December	2500	Potbelly	2,412	Yes	Yes	No