

Effectiveness of Sprinkling During Transport



Swine Innovation Porc

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on behalf of Swine Innovation Porc

Research funded by Swine Innovation Porc has found sprinkling pigs on-farm prior to transport, and just prior to unloading at the packing plant, improve pig comfort and meat quality when outside air temperatures exceed 20 °C. Results were generated from a pan-Canadian project conducted in summer 2011 by Luigi Faucitano, Centre for Research and Development of the Dairy and Swine Agriculture and Agri-Food Canada, Sherbrooke, Quebec.

It has been generally accepted high temperatures contribute to the mortality of pigs during transport, and sprinkling during transport effectively reduces the pig's body temperature. Currently there are no standard guidelines when to sprinkle pigs during summer months, rather truckers sprinkle the pigs when they feel it is "hot". This study, the first of its kind in North America, has been conducted to provide a clear procedure to follow for the transport of pigs to the slaughterhouse under summer conditions. To accomplish this, the efficacy of sprinkling was evaluated in a trailer in hot conditions on the welfare of pigs and meat quality, in addition to identifying the most suitable temperature for the maximum efficiency of the mist.

From June to mid-September 2011, nearly 5,000 market pigs were transported (for 2 hours) to slaughter in one of two pot belly trailers with a capacity of 208 hogs. Trailer #1 was equipped with a sprinkling system designed to sprinkle the pigs 5 minutes prior to departure at loading (on-farm), and 5 minutes before unloading at the slaughter plant in order to reduce the stress associated with loading and wait before unloading.

Spraying 125 liters of water for after at loading (on-farm) and just prior to unloading (at slaughterhouse) was effective in reducing stress

body temperature. However, when conditions are extreme, these regulatory capacities may be insufficient to dissipate heat and it is at this point that death by hyperthermia may occur.

During summer, the temperature inside a pot-belly trailer can be hotter than the ambient outside temperature up to 6 ° C, especially in the lower compartments and those on the front of the middle deck. When these conditions exist it is beneficial to cool pigs through sprinkling, reducing body temperature in hot weather and improving the pig's well-being. The current guidelines for

"At 20° C or more, sprinkling during transport is beneficial"

associated with transport, and subsequently improving meat quality of pigs located in critical compartments - when outside air temperatures exceed 20 °C. Results were obtained by measuring blood lactate levels at slaughter and pH one hour after slaughter and drip loss in the loin muscle.

Negative heat

The upper limit of the thermoneutral zone of pigs during transport is 30 ° C. Above this temperature pigs must use various behavioral and physiological mechanisms to maintain constant

use of sprinkler systems are based on industry practices, and are inconsistent because some guidelines recommend watering pigs in a stationary vehicle at ambient temperatures of 15 ° C ,while other guidelines recommend sprinkling at 27 ° C.

During the experiment, the outside temperature ranged from 14.1 to 25.8 °C. Researchers collected additional data such as variations in temperature, relative humidity and ammonia levels in the trailers, in addition to the change in body temperature of pigs, stress and behavior of animals. The temperature of the pigs was

recorded using temperature data loggers (iButton) which were orally administered. Several observations were made using video cameras in four compartments - one on the upper deck, two on the middle deck, and on the lower deck - tested each of the two semi-trailers.

What is a iButton?

The iButton is a digital thermometer connected to a computer chip enclosed in a stainless steel box. In this project, the iButtons were orally administered 12 hours before loading pigs and recordings were made from the gastrointestinal tract during the handling and transport.

Relax in a shower

Pigs transported in semi-trailer equipped with a sprinkling showed a lower blood lactate level than pigs transported with no sprinkling system. The lower lactate level indicates an improvement in their physical condition caused by reduced fatigue during slaughter. An hour after bleeding, the rate of acidification of the meat, as measured by the pH in the loin muscle is lower in pigs showered, indicating a pig less stressed and a better quality of meat.

Very few Canadian trucks are equipped with a sprinkling system because of uncertainty about its effectiveness and the lack of guidelines for its use. Recommendations generated from this project will make a difference as they are now included in the training program "Canadian Livestock Transport". Results led the researchers to conclude that sprinkling may help alleviate heat stress in transport, and without increasing slipping and falls during unloading.

Acknowledgements

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(Rebuilding an Industry ... cont'd from page 1)

This article is built on the premise that things get better or worse but they do not stay the same. For the past 25 years we have grown accustomed to an industry with unlimited growth potential, a similar but shorter period took place in the mid-70's when we 'skipped a portion of the 4-year cycle' and hog prices rose when they traditionally should have declined, and it fueled an investment surge. I was in university at the time and we had classmates considering dropping out to join an expansion in the family business – some did, and successfully built careers from that moment of change.

- 1) Productivity in our barns across the country has never been better – or more consistent
- 2) Reinvestment on a large scale is starting to take place – think Shuanghui-Smithfield transaction and similar game changers with the companies we know in Canada
- 3) Grain prices are moving in the opposite direction to the past three years and stocks are projected to be catching up to increased useage growth.
- 4) World prices for pork are rising, some because of the latent effect of high feed prices, finally pushing pork prices, some driven by increased appetites and restricted availability to pork outside North America.

Of course not all change is pointing in the same direction. There are significant limitations to financial resources and some changes such as north-south trade in pigs and pork will not 'return to normal' in the short term. As a Research Centre serving the knowledge and technology needs of the industry we are rethinking – what do pork producers need now and in the next decade and how should we address that need? Some challenges that are being identified and will need to be addressed in our next 5-year business plan are listed below:

- 1) Welfare codes – with the added investment will it result in added income for producers and better welfare for pigs?
- 2) Barn age and condition – the 1990's building boom has reached a maintenance milestone, new investment and technologies are required to prepare these structures for the next twenty years.

- 3) Global growth and interdependence can result in new challenges like Porcine Epidemic Diarrhea (PED).
- 4) Avoid becoming complacent on diet costs – keep implementing those practices that helped us survive 2012-13.
- 5) The face of our labour force has changed – how are we contributing to a trained, safe and loyal workforce?
- 6) New investment in keeping cost of production low should be the priority. Given a dollar to spend where is the best investment? Do we have the tools and expertise to answer that confidently on a farm by farm basis?
- 7) Investment in new technologies for livestock production is under pressure. Why will companies invest in technology development for swine if current trends to protect markets (removal of ractopamine) and create new niches (example removal of antibiotics) seem to focus on what to "take out of pork production". This is an ominous trend to reject technology rather than making the most use of science to improve growth, efficiency and product quality.

It is our promise to you that we are and will be addressing these challenges and others. The Prairie Swine Centre downsized, economized and modified how it does business over the past five years as a result of the many external pressures on the industry. But through this change the Centre worked to maintain its unique mandate and mission. As we develop the next 5-year strategic plan for Prairie Swine Centre we will be seeking your insight and guidance on what the right questions are and how we should be addressing them.

The industry will rebuild – we are committed to looking for the opportunities. Our role is addressing the use of technology as producers redevelop their business models, providing the type of information governments and financial institutions need to re-engage with industry, and generating the breakthroughs that attract the attention of young people to seek careers as veterinarians, stockpeople, service people and researchers. This will take time. 