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Trailer Design, Loading and Unloading Market Hogs

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Introduction

Transportation of livestock in general has created a significant amount of interest in regard to animal welfare, primarily transport losses. Transport losses are referred to as pigs that die or become non-ambulatory (unable to walk) during any part of the marketing process. These losses may be identified as a multi-factorial problem which includes factors such as human-animal interaction, the environment of the animal and the individual animal. Ritter and coworkers (2008) reviewed 22 field studies containing more than 4 million pigs and reported that mortality losses averaged 0.25% (10,000 out of 4 million hogs). In addition, Fitzgerald et al. (2009) collected data on more than 2 million pigs transported from nine farms to a single packing plant and also observed a mortality rate of 0.25%. Furthermore, transport losses represent multiple challenges to the entire U. S. food chain with major implications to animal well being and economics such as direct financial losses to the pork producer and pork processor. Trailer design may be one of the many factors that may influence the level of stress for pigs being transported.

Trailer types

In a study by Kephart et al (2010), the unloading of 41,474 market pigs was observed that represented 242 trailer loads (171 pig average per load). Trailer types used in this study included: 1) potbelly (PB) with a standard roll up door (37 inches wide), 2) straight-deck conventional (SDC) with a roll-up unloading door 37 inches wide and 3) straight-deck wide-opening (SDW) with a standard roll-up door (37 inches wide) and an additional hinged door (31 inches wide) adjacent to the roll-up door for a total opening of 68 inches. In this study, 73 loads were delivered on potbelly trailers, 88 loads delivered on straight-deck conventional trailers and 81 loads on straight-wide trailers. Results of this study (Table 1) indicated that the percentage of pigs exhibiting open-mouth breathing transported on potbelly trailers was greater than that of pigs transported straight deck conventional and straight-deck wide-opening trailers. The observation of more pigs exhibiting open-mouth breathing and skin discoloration that were unloaded from potbelly trailers may be directly related to pigs loaded in the “belly” of the trailer and pigs loaded in the front compartment of the middle deck had to negotiate an internal ramp of approximately 20° compared to the other two types of trailers in which no internal ramps were used.

Table 1. Influence of Trailer Type on Pig Behavior.^a

Trailer Type	Open-Mouth Breathing, %	Unloading Time, Min
Potbelly	2.99	17.3
Straight	1.62	12.4
Straight-wide	0.66	10.3

^aAdapted from Kephart et al., 2010.

Similar results were reported by Ritter et al (2008) that studied the effects of season and distance moved during loading on transport losses of market-weight pigs comparing two different trailer types. In this study, 109 loads of pigs were evaluated (53 loads loaded

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and transported on a potbelly trailer and 56 loads loaded and transported on a straight deck trailer, respectively). Results indicated that signs of open-mouth breathing in pigs unloaded from potbelly trailers were greater in the spring and summer compared to pigs unloaded from the straight deck trailer type. Additionally, the incidence of skin discoloration was greater in pigs unloaded from potbelly trailers in the spring, summer and winter. Loading times were similar for the two trailer types, however, the time to unload was considerably greater for the potbelly trailers (Table 2). This could be attributed to the difficulty experienced by handlers to move pigs easily from the potbelly trailer. Therefore, pigs may experience greater stress during unloading from the potbelly trailers compared to straight deck trailers. Moreover, it should be noted that there was no significant effect of trailer design on either transport losses or carcass trim loss.

Table 2. Effect of Trailer Design on Physical Indicators of Stress after Loading and Unloading.^a

Item	Trailer Design	
	Potbelly	Straight Deck
Open mouth breathing %, after loading	9.68	11.5
Skin discoloration %, after loading	2.81	2.58
Muscle tremors %, after loading	0.04	0.02
Muscle tremors %, after unloading	0.22	0.13
Loading time, minutes	68.7	63.7
Unloading time, minutes	35.9	20.2

^aAdapted from Ritter et al., 2008.

Take Home Message

In summary, it is imperative that producers and transporters need to be cognoscente of the many factors associated with transportation management of pigs with trailer design being one of those factors. With proper transportation management practices and an extensive understanding of animal handling techniques, the pork industry can assure that a proactive approach is being taken to address the concerns for animal well being and economics. In turn, this benefits all parties involved including the pigs, pork producers and packing plants.

Resources

Fitzgerald, R. F., K. J. Stalder, J. O. Matthews, C. M. Schultz Kaster and A. K. Johnson. 2009. Factors associated with fatigued, injured and dead pig frequency during transport and lairage at a commercial abattoir. *J. Anim. Sci.* 87:1156-1166.

Kephart, K. B., M. T. Harper and C. R. Raines. 2010. Observations of market pigs following transport to a packing plant. *J. Anim. Sci.* 88:2199-2203.

Ritter, M. J., M. Ellis, R. Bowman, J. Brinkman, S. E. Curtis, J. M. DeDecker, O. Mendoza, C. M.

Murphy, D. G. Orellana, B. A. Peterson, A. Rojo, J. M. Schlipf, and B. F. Wolter. 2008. Effects of season and distance moved during loading on transport losses of market-weight pigs in two commercially available types of trailers.

Swine Management Program in the Institute of Agricultural Technology Accepting Applicants

Certificate programs offered through the Institute of Agricultural Technology (IAT) at Michigan State University provide students with practical training in on-campus courses and off-campus internship experiences. The Swine Management program is two semesters in length and begins during the fall semester. They allow men and women the opportunity to specialize in the area of swine management with a one-year intensified program.

Students enrolled in the swine management program will develop a greater knowledge of swine enterprise management. The program includes a clerkship requirement which provides a thorough “hands-on” experience with members of farm staff to accomplish day-to-day, standard procedures. The swine clerkship at the MSU Swine Teaching and Research Center is designed to develop skills in modern swine production. In addition to clerkship, students are required to complete courses with faculty and staff in the Department of Animal Science and a variety of elective areas.

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Announcing MSUE Pork Team State Wide Winter and Spring Programs!

The Pork Industry is ever changing! Can you maintain your current level of production and efficiency without challenging yourself to learn and know more about the industry your work in? Join the MSUE Pork Team to learn further how to improve your performance, your business and ultimately your bottom line. Watch for further details in the next issue of the Pork Quarterly and on-line at <http://web1.msue.msu.edu/aoe/pork/>.

Finishing Management Seminars

Co-sponsors: Automated Production Systems and Hamilton Distributing Company

Meeting Dates:

Jan. 12 – Centerville, MI

Jan. 13 – Allegan, MI

Jan. 19 – Mount Pleasant, MI

Topics to include;

- Ventilation tune-up
- Pit foam – What is it? What can be done with it? How to be safe?
- Maintenance, repairs, and remodeling
- How to decrease farm odors
- Becoming a better decision maker about euthanasia
- Emergencies - plan for them and work to avoid them

PQA Plus Certification-Recertification Sessions, 3:30 to 4:45 PM. prior to each Finishing Management Seminar by local educator; preregistration is required for attending a PQA Plus session.

2011 Green and White Education Fair and Show January 28-29, 2011

Pavilion for Livestock and Agriculture Education, MSU, East Lansing, MI.

This day long event for Youth will feature;

- Swine Quiz Bowl
- Swine Skillathon
- Powerpoint Presentation Contest
- Essay Contest
- Scholarship Contest
- Market Hog Show

2011 Professional Pork Producers Symposium

Co-sponsors: Michigan Pork Producers Association and Elanco Animal Health

Thursday, February 24, 2011

The Lansing Center, Lansing, MI

Topics to Include;

- Pre-harvest food safety
- Minimizing odors leaving the farm
- Managing production in a 20,000 grandparent sow system
- Practical ways to decrease energy use on the farm
- Feed quality assurance
- The future of feed-grade antibiotics
- Managing the “unit” budget

2011 Michigan Pork Producers Association State-wide Informational Meetings: Co-sponsors: Michigan Pork Producers Association and Pfizer Animal Health

This program is presented at four different locations across Michigan in late March. Watch for further details regarding topics, locations and dates in the January issues of the Pork Quarterly, and the Michigan Pork magazine, and on-line at Michigan Pork Producers Association website, www.mipork.org, or the MSUE Pork TEAM website, <http://web1.msue.msu.edu/aoe/pork/>.

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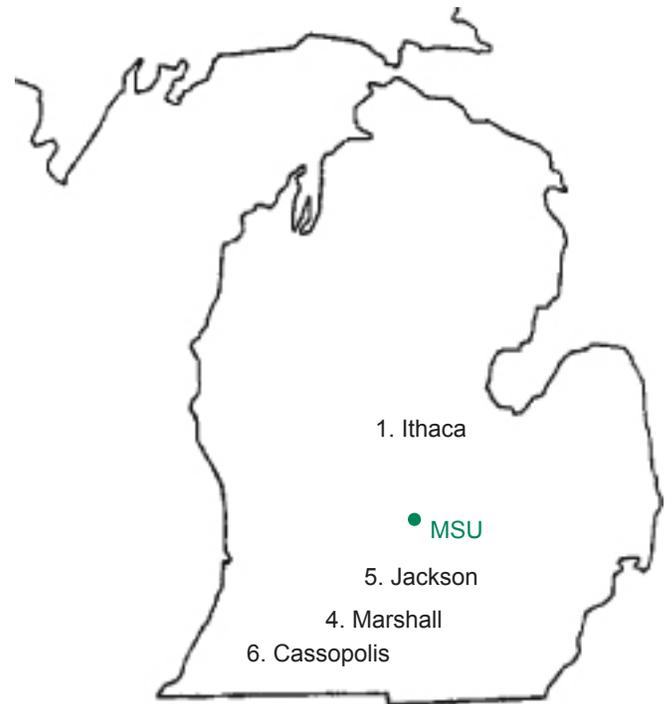
Bringing Knowledge to Life!

Pork Quarterly

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Learning goes beyond the classroom and the clerkship for the swine management students as they participate in internships. Internships are a form of placement training, compelling students to apply what they have learned in the classroom and through clerkships. They must interact with talented and experienced people in their field, from whom they continue to learn. Internships are an extremely valuable portion of the Ag Tech programs, providing students with the opportunity to broaden their knowledge of the swine industry, along with development of professional skills. In addition, the internship experience earns the students credit toward their certificate.

For admission to the Institute of Agricultural Technology (<http://iat.anr.msu.edu/>), contact the office in 120 Agriculture Hall, East Lansing, MI, 48824, or call (517) 355-0190. Admission is determined by the Institute. You may also contact Ms. Ashley Bushman, Coordinator of the Swine Management Program, at (517) 432-1389 or via e-mail at bushmana@msu.edu. Additional information can be obtained on the Department of Animal Science website (www.canr.msu.edu/dept/ans/index.html) at Michigan State University.



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