Hog Handling – Tips for Better Pig Handling

Matt Ritter, Ph.D.
Swine Technical Consultant
ELANCO Animal Health

Ohio Pork Congress
Columbus, OH
February 6, 2008

SBU2164

Areas to Discuss

- Define transport losses
- Why are transport losses important?
- Fatigued pigs
  - Incidence
  - Symptoms
  - Metabolic characteristics
  - Pre-disposing factors
- What can we do to reduce transport losses?

SBU2164

Transport Losses: Definitions

- Dead on arrival (DOA):
  - A pig that died during transport
- Dead in Yard (DIY) or Dead in Pen (DIP)
  - A pig that died after unloading (usually in the lairage pen)
- Non-ambulatory pig:
  - A pig unable to move or keep up with contemporaries
  - Downers, subjects, slows, suspects, cripples, stressors, fatigued, injured
- Transport losses:
  - The sum of dead and non-ambulatory pigs at the plant

SBU2164

Classifying Non-ambulatory Pigs

Fatigued (Stress related)

Injured (Structure/injury related)

Ellis, M., F. McKeith, and M. Ritter. 2004. Handling Non-Ambulatory Pigs. Proceedings of the International Meat Animal Welfare Research Conference, Kansas City, MO.

SBU2164

Why are transport losses important?

- Transport losses represent many growing concerns to the U.S. swine industry:
  - Animal welfare
  - Increased regulations
  - Economic

Ritter, M. and M. Ellis. 2006. Non-ambulatory pigs: reducing incidence, handling properly. Proceedings of the Animal Care and Handling Conference, Overland Park, KS.

SBU2164

Proposed Legislation

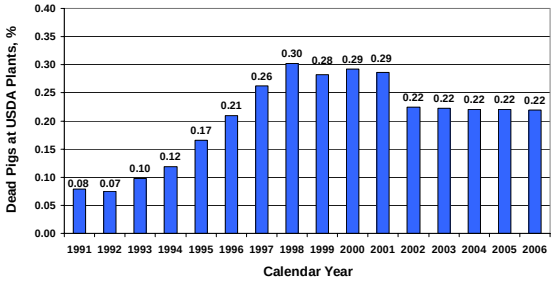
- Downed Animal Protection Act (H.R. 661 & S. 394)
  - Allows the Secretary of Agriculture to enforce regulations for handling and disposition of non-ambulatory livestock
  - Prevents movement of non-ambulatory livestock while animals are conscious
  - Requires non-ambulatory livestock to be humanely euthanized
  - Prohibits non-ambulatory livestock from entering the food chain
- Bill is being reviewed by U.S. House and Senate Ag subcommittees
- If this bill passes, fatigued and injured pigs will have zero value!

U.S. House of Representatives. 2007. H. R. 661: Downed animal and food safety protection act. http://thomas.loc.gov/cgi-bin/bdquery/D?d110:1:./temp/~bdurJU:@@@L&summ2=m&|/bss/110search.html|. Accessed Dec. 3, 2007.

U.S. Senate. 2007. S. 394: Downed animal and food safety protection act. http://thomas.loc.gov/cgi-bin/bdquery/D?d110:1:./temp/~bdurJU:@@@L&summ2=m&|/bss/110search.html|. Accessed Dec. 3, 2007.

SBU2164

Yearly Incidence of Dead Pigs at USDA Inspected Plants (1991-2006)



FSIS. 2007. Market swine condemned ante-mortem for deads in USDA inspected plants for the calendar years of 1991 to 2006. FOIA Case # 07-148.

SBU2164

Non-ambulatory Pigs at the Plant

- National statistics are not available for non-ambulatory pigs
- A summary of 22 commercial field trials (2000-2007)
  - 4,607,567 market weight pigs
  - 27,240 trailer loads of pigs

Plant Losses	Mean	Minimum	Maximum
Deads, %	0.25	0.00	0.77
Non-ambulatory, %	0.37	0.11	2.34
Total losses, %	0.62	0.14	2.39

~1 pig per load dies or becomes non-ambulatory at the plant

Ritter, M. J. 2008. A review of transport losses in market weight pigs. To be presented at the 2008 Midwest Animal Science Meetings, Des Moines, IA.

SBU2164

Fatigued and Injured Pigs at the Plant

- A summary of 17 commercial field trials (2000-2007)
  - 2,913,417 market weight pigs
  - 17,505 trailer loads of pigs

Plant Losses	Mean	Minimum	Maximum
Fatigued, %	0.24	0.05	1.98
Injured, %	0.06	0.04	0.45

~4:1 ratio of fatigued to injured pigs at the plant

Ritter, M. J. 2008. A review of transport losses in market weight pigs. To be presented at the 2008 Midwest Animal Science Meetings, Des Moines, IA.

SBU2164

Economic Impact of Transport Losses

- Producer
  - Complete loss of value on dead pigs
  - Potential disposal fees for dead pigs
  - Severe discount on non-ambulatory pigs at the plant
  - Carcass bruising and trim loss
- Packer
  - Increased labor costs for handling non-ambulatory pigs
  - USDA and plant welfare audits evaluate how non-ambulatory pigs are handled
  - Potential pork quality defects (DFD, PSE)
  - Meat from non-ambulatory pigs cannot be used in government food programs

Ellis, M., F. McKeith, D. Hamilton, T. Bertol, and M. Ritter. 2003. "Analysis of the current situation: what do downers cost the industry and what can we do about it?" Pages 1-3 in Proceedings of the 4th American Meat Science Association Pork Quality Symposium, Columbia, MO.

Ritter, M., M. Ellis, M. Benjamin, E. Berg, P. DuBois, J. Marchant-Forde, A. Green, P. Matzat, P. Mormede, T. Moyer, K. Pfalzgraf, M. Siemens, J. Sterle, T. Whiting, B. Wolter, and A. Johnson. 2005. The fatigued pig syndrome. Journal of Animal Science. 83(Suppl. 1):258. (Abstr.)

SBU2164

Estimated Economic Impact of Transport Losses in 2006

2006 Economic Assumptions	
Pigs slaughtered, #[1]	103,688,100
Average live price, cwt[2]	$46.60
Average live weight, lbs[1]	269.3
Average pig value, $	$125.49

Transport Losses	Pigs (%)	Pigs (#)	Average Losses ($/pig)	Total Losses ($)
Dead [3]	0.22%	228,114	$125.49	$28,626,025.86
Non-ambulatory [4]	0.37%	383,646	$62.75	$24,071,868.27
				$52,697,894.13

[1]USDA, NASS. 2007. Hog slaughter national statistics request for 2006 for all states. http://www.nass.usda.gov/QuickStats/PullData_US.jsp. Accessed Nov. 1, 2007.

[2]USDA, NASS. 2007. Agricultural prices – 2006 summary. http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1003 Accessed Nov. 2, 2007.

[3]FSIS. 2007. Market swine condemned ante-mortem for deads in USDA inspected plants for the calendar years of 1991 to 2006. FOIA Case # 07-148.

[4]Ritter, M. J. 2008. A review of transport losses in market weight pigs. To be presented at the 2008 Midwest Animal Science Meetings, Des Moines, IA.

SBU2164

Symptoms and Metabolic Characteristics of Fatigued Pigs

SBU2164

Fatigued Pig Symptoms

Normal Pig

↓ Stress

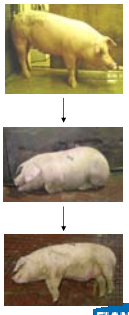
Open-Mouth Breathing
Skin Discoloration
Refuse to move

↓ Stress

Abnormal Vocalization
Muscle Tremors
Collapse = Fatigued

↓ Stress

Death



Ritter, M., M. Ellis, M. Benjamin, E. Berg, P. DuBois, J. Marchant-Forde, A. Green, P. Matzat, P. Mormede, T. Moyer, K. Pfalzgraf, M. Siemens, J. Sterle, T. Whiting, B. Wolter, and A. Johnson. 2005. The fatigued pig syndrome. Journal of Animal Science. 83(Suppl. 1):258. (Abstr.)

SBU2164

Muscle Energy Metabolism: Normal Resting Conditions

Oxidative Metabolism

Carbohydrates (Glycogen + Glucose) → **Oxygen** → **Energy** (37 ATP)

Hedrick, H. B., E. D. Aberle, J. C. Forrest, M. D. Judge, and R. A. Merkel. 1994. Pages 87-92 in Principles of Meat Science, Third Edition. Kendall/Hunt Publishing Company, Dubuque, IA.

SBU2164

Muscle Energy Metabolism: Stressful Conditions

Anaerobic Glycolysis

Carbohydrates (Glycogen + Glucose) → **~~Oxygen~~** → **Lactic Acid** + **Heat** + **Energy** ~~(37 ATP)~~ **3 ATP**

Hedrick, H. B., E. D. Aberle, J. C. Forrest, M. D. Judge, and R. A. Merkel. 1994. Pages 87-92 in Principles of Meat Science, Third Edition. Kendall/Hunt Publishing Company, Dubuque, IA.

SBU2164

Metabolic Changes in Fatigued Pigs

- **Fatigued pigs are in a metabolic state of acidosis**

Measurement	Normal Resting Values	Normal Pig During Unloading	Fatigued Pig During Unloading
Blood lactic acid, mmol/L	3.23	11.1	32.2
Blood pH	7.39	7.35	7.11

Anderson, D. B., D. J. Ivers, M. E. Benjamin, H. W. Gonyou, D. J. Jones, K. D. Miller, R. K. McGuffey, T. A. Armstrong, D. H. Mowrey, L. F. Richardson, R. Seneriz, J. R. Wagner, L. E. Watkins, and A. G. Zimmermann. 2002. Physiological responses of market hogs to different handling practices. Pages 399-400 in Proceedings of the American Association of Swine Veterinarians, Kansas City, MO.

Bertol, T. M., M. Ellis, M. J. Ritter and F. K. McKeith. 2005. Effect of feed withdrawal and handling intensity on longissimus muscle glycolytic potential and blood measurements in slaughter weight pigs. Journal of Animal Science. 83:1536-1542.

Bertol., T. M., M. Ellis, D. N. Hamilton, E. W. Johnson, and M. J. Ritter. 2005. Effect of dietary supplementation with L-carnitine and fat on blood acid-base responses to handling in slaughter weight pigs. Journal of Animal Science. 83:75-81.

Hamilton, D. N., M. Ellis, T. M. Bertol, and K. D. Miller. 2004. Effects of handling intensity and live weight on blood acid-base status in finishing pigs. Journal of Animal Science. 82:2405-2409.

Ritter, M. J. 2007. Effects of animal handling and transportation factors on the welfare, stress responses, and incidences of transport losses in market weight pigs at the packing plant. PhD Diss. University of Illinois, Urbana-Champaign.

SBU2164

Metabolic Changes in Fatigued Pigs

- **Fatigued pigs may have elevated body temperatures**

Measurement	Normal Resting Values	Normal Pig After Handling	Fatigued Pig After Handling
Body temperature, °F	102.3	104.6	106.2

- Anecdotal field data has suggested that the body temperatures of fatigued pigs may reach as high as 105-110°F in the summer

Bertol, T. M., M. Ellis, M. J. Ritter and F. K. McKeith. 2005. Effect of feed withdrawal and handling intensity on longissimus muscle glycolytic potential and blood measurements in slaughter weight pigs. Journal of Animal Science. 83:1536-1542.

Bertol., T. M., M. Ellis, D. N. Hamilton, E. W. Johnson, and M. J. Ritter. 2005. Effect of dietary supplementation with L-carnitine and fat on blood acid-base responses to handling in slaughter weight pigs. Journal of Animal Science. 83:75-81.

Hamilton, D. N., M. Ellis, T. M. Bertol, and K. D. Miller. 2004. Effects of handling intensity and live weight on blood acid-base status in finishing pigs. Journal of Animal Science. 82:2405-2409.

Ritter, M. J. 2007. Effects of animal handling and transportation factors on the welfare, stress responses, and incidences of transport losses in market weight pigs at the packing plant. Pages PhD Diss. University of Illinois, Urbana-Champaign.

Elanco Trial #AF7CA0101. Data on file.

SBU2164

Can Fatigued Pigs Recover?

- Anderson et al. (2002) and Hamilton et al. (2004)
  - Body temperature, blood lactic acid, and blood pH values of aggressively handled pigs return to baseline resting values after 2 h of rest
- Ritter et al. (2006)
  - Monitored 25 pigs that became fatigued on the trailer during loading and followed these pigs to the plant after a 3 h transport time
  - 18 (72%) were normal during unloading
- **These data suggest that the vast majority of stressed and fatigued pigs will recover, if the stressors are removed and pigs are allowed to rest for 2 to 3 h**

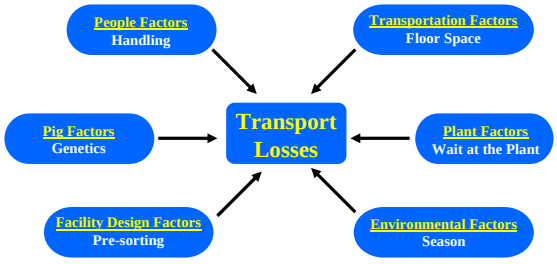
Anderson, D. B., D. J. Ivers, M. E. Benjamin, H. W. Gonyou, D. J. Jones, K. D. Miller, R. K. McGuffey, T. A. Armstrong, D. H. Mowrey, L. F. Richardson, R. Seneriz, J. R. Wagner, L. E. Watkins, and A. G. Zimmermann. 2002. Physiological responses of market hogs to different handling practices. Pages 399-400 in Proceedings of the American Association of Swine Veterinarians, Kansas City, MO.

Hamilton, D. N., M. Ellis, T. M. Bertol, and K. D. Miller. 2004. Effects of handling intensity and live weight on blood acid-base status in finishing pigs. Journal of Animal Science. 82:2405-2409.

Ritter, M. J., M. Ellis, J. Brinkmann, J. M. DeDecker, M. E. Kocher, K. K. Keffaber, B. A. Peterson, J. M. Schlipf, and B. F. Wolter. 2006. Effect of floor space during transport of market weight pigs on incidence of transport losses (dead and non-ambulatory pigs) at the packing plant and relationships between transport conditions and losses. Journal of Animal Science. 84:2856-2864.

SBU2164

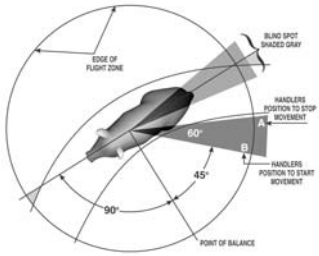
Multi-factorial Problem



Growers, loading crews, truck drivers, and handlers at the plant can impact transport losses!

Ritter, M., M. Ellis, M. Benjamin, E. Berg, P. DuBois, J. Marchant-Forde, A. Green, P. Matzat, P. Mormede, T. Moyer, K. Pfalzgraf, M. Siemens, J. Sterle, T. Whiting, B. Wolter, and A. Johnson. 2005. The fatigued pig syndrome. Journal of Animal Science. 83(Suppl. 1):258. (Abstr.)

Flight Zone and Point of Balance

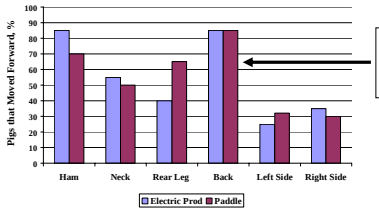


(Photo courtesy of the National Pork Board's TQA Handbook, 2004)

National Pork Board. 2004. Trucker Quality Assurance Handbook. C. Stahl, ed. National Pork Board, Des Moines, IA.

Understanding the Flight Zone

- McGlone et al., 2004
  - 180 pigs were encouraged to move forward through a handling course
  - Pigs were tapped/shocked on ham, neck, rear leg, back, left side or right side
  - The direction the pig moved after the tap or shock was recorded

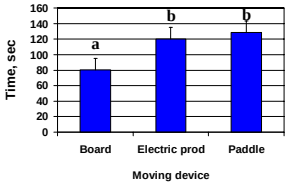


Most effective area to tap or shock a pig is on the back

McGlone, J. J., R. L. McPherson, and D. L. Anderson. 2004. Case study: moving devices for finishing pigs: Efficacy of electric prod, board, paddle, or flag. The Professional Animal Scientist. 20:518-523.

Handling Device

- McGlone et al., 2004
  - Evaluated moving pigs with a sorting board, an electric prod, or a paddle.



  - Concluded that a sorting board is the single most effective handling device
  - Therefore, all handlers should use a sorting board when moving pigs

McGlone, J. J., R. L. McPherson, and D. L. Anderson. 2004. Case study: moving devices for finishing pigs: Efficacy of electric prod, board, paddle, or flag. The Professional Animal Scientist. 20:518-523.

Handling Intensity

- Benjamin et al., 2001
  - Compared moving pigs with aggressive or gentle handling
    - Aggressive: pigs moved rapidly with hot shots
    - Gentle: pigs moved at their own pace with plastic cane

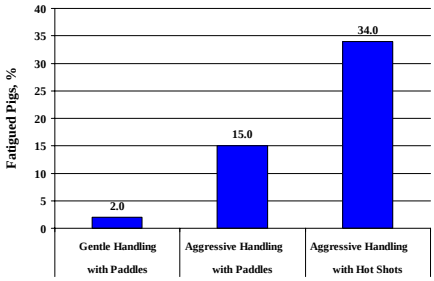
Measurements	Gentle Handling	Aggressive Handling
Lactic acid, mmol/L	4.0[a]	25.2[b]
Fatigued pigs, %	0.0[a]	20.4[b]

[a,b,c] Means with different superscripts differ

Benjamin, M. E., H. W. Gonyou, D. J. Ivers, L. F. Richardson, D. J. Jones, J. R. Wagner, R. Seneriz, and D. B. Anderson. 2001. Effect of animal handling method on the incidence of stress response in market swine in a model system. Journal of Animal Science. 79(Suppl. 1):279. (Abstr.)

Handling Intensity

- Gonyou, unpublished data



Elanco Trial #AF7CA0101. Data on file.

Minimal Electric Prod Use?

- Ritter, unpublished data
  - Moved 48 market pigs through a 164 ft course at their own pace
  - Compared 0 (paddles) vs. 2 vs. 4 shocks from a hot shot
  - Shock duration was ≤ 1 second

	Handling Treatment		
Post-handling Values	**0 Shocks**	**2 Shocks**	**4 Shocks**
Rectal Temperature, °F	102.6[a]	102.9[ab]	103.3[b]
Blood Lactic Acid, mmol/L	4.96[a]	5.30[a]	6.84[b]

[a,b] Means with different superscripts differ (P < 0.05)

Elanco trial # T2F170606. Data on file.

SBU2164

Proper Use of Electric Prods

- Electric prods should only be used as a last resort to move pigs
- Try the following handling methods before using an electric prod
  - Tap the pigs with the wand of the electric prod
  - Shock the gates and/or ceiling with the electric prod
  - Tap the pigs with your hand
  - Push the pigs
- If electric prods are used, use the following guidelines:
  - Never use an electric prod in the pen during loading
  - Never shock a pig in a sensitive area (i.e., eyes, nose, anus, genitals, etc.)
  - The pig should be shocked on the back behind the point of balance
  - The duration of the shock should not exceed 1 second
  - Count to 5 before administering any additional taps or shocks
  - Do not exceed 2 shocks per pig during loading

SBU2164

Group Size

- Pigs that wedge or jam in the aisle during handling are more susceptible to becoming fatigued (Anderson et al., 2002)
- To minimize stress during loading, move pigs in small groups of 4 to 6 pigs
- Optimal group size is dependent upon:
  - Aisle width and pig weight
  - Need to be able to reach the first pig

Anderson, D. B., D. J. Ivers, M. E. Benjamin, H. W. Gonyou, D. J. Jones, K. D. Miller, R. K. McGuffey, T. A. Armstrong, D. H. Mowrey, L. F. Richardson, R. Seneriz, J. R. Wagner, L. E. Watkins, and A. G. Zimmermann. 2002. Physiological responses of market hogs to different handling practices. Pages 399-400 in Proceedings of the American Association of Swine Veterinarians, Kansas City, MO.

SBU2164

Handling Summary

- The single most effective handling device is a sorting boarding
- The most effective place to tap or shock a pig is on the back behind the point of balance
- Stress responses are minimized when pigs are:
  - Moved at a slow and calm pace
  - Moved in small groups
  - Moved with paddles or with ≤ 2 shocks/pig from an electric prod

SBU2164

Effects of HAL-1843 Gene on DOAs

		DOA, %		
Study	Country	Negative	Carrier	Positive
Fàbrega et al., 2002	Spain	0.02	0.09	2.29
Murray & Johnson, 1998	Canada	0.05	0.27	9.20
McPhee et al., 1994	Australia	0.30	2.20	17.5

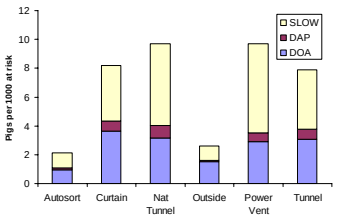
- ***Ritter et al., 2007***
  - ***98% of fatigued pigs and 95% of DOAs were negative for HAL-1843***

Fàbrega, E., A. Diestre, D. Carrión, J. Font, and X. Manteca. 2002. Effect of the halothane gene on pre-slaughter mortality in two Spanish commercial pig abattoirs. Animal Welfare. 11:449-452.
Murray, A. C., and C. P. Johnson. 1998. Impact of the halothane gene on muscle quality and pre-slaughter deaths in Western Canadian pigs. Canadian Journal of Animal Science. 78:543-548.
McPhee, C. P., L. J. Daniels, H. L. Kramer, G. M. Macbeth, and J. W. Noble. 1994. The effects of selection for lean growth and the halothane allele on growth performance and mortality of pigs in a tropical environment. Livestock Production Science. 38:117-123.
Ritter, M. J., M. Ellis, G. R. Hollis, F. K. McKeith, D. G. Orellana, P. Van Genugten, S. E. Curtis, and J. M. Schlipf. 2007. Frequency of the HAL-1843 mutation of the Ryanodine Receptor gene in dead and non-ambulatory/non-injured pigs on arrival at the packing plant. Journal of Animal Science. doi:10.2527/jas.2007-0329.

SBU2164

Facility Design

- Rademacher & Davies, 2005
  - Data based on ~1.3 million pigs marketed in the Midwest



Rademacher, C., and P. Davies. 2005. Factors associated with the incidence of mortality during transport of market hogs. Pages 186-191 in Proceedings of the Allen D. Leman Swine Conference, St. Paul, MN.

SBU2164

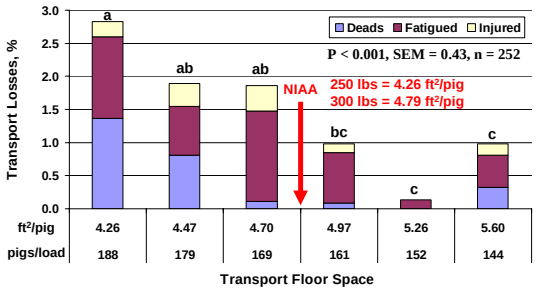
Large Pens and Pre-sorting

- Potential advantages
  - Pigs have more room to exercise during the grow-finish period
  - Pre-sorting allows pigs an opportunity to recover from the stress of being sorted from pen mates
  - Pre-sorting reduces distance moved from pen to truck
  - Feed withdrawal can be implemented on all pigs
  - Little to no mixing of unfamiliar pigs

SBU2164

Transport Floor Space

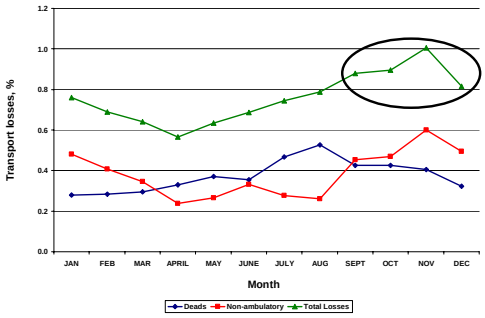
- Utilized 42 loads in spring and fall to determine the effects of transport floor space on losses at the plant



Ritter, M. J., M. Ellis, C. R. Bertelsen, R. Bowman, J. Brinkmann, J. M. DeDecker, K. K. Keffaber, C. M. Murphy, B. A. Peterson, J. M. Schlipf, and B. F. Wolter. 2007. Effects of distance moved during loading and floor space on the trailer during transport on losses of market weight pigs on arrival at the packing plant. Journal of Animal Science. 85: 3454-3461.

SBU2164

Seasonal Variation in the Midwest



Rademacher, C., and P. Davies. 2005. Factors associated with the incidence of mortality during transport of market hogs. Pages 186-191 in Proceedings of the Allen D. Leman Swine Conference, St. Paul, MN.

SBU2164

Seasonal Variation in Non-ambulatory Pigs

- Rate of non-ambulatory pigs increases in the Midwest during late fall and early winter (Ellis & Ritter, 2006)
- Potential explanations proposed by Ellis & Ritter (2006):
  - Temperature stress
  - Heavier pigs
  - Increased number of pigs transported
  - Health status
  - Summer is over!

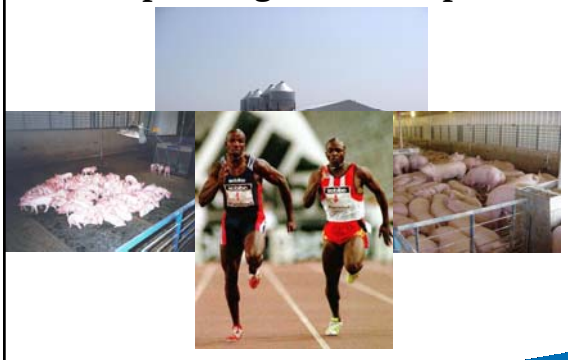
Ellis, M., and M. Ritter. 2006. Impact of season on production: transport losses. Pages 205-207 in Proceedings of the 2006 Allen D. Leman Swine Conference, St. Paul, MN.

SBU2164

What can we do to reduce transport losses?

SBU2164

Prepare Pigs for Transport



SBU2164

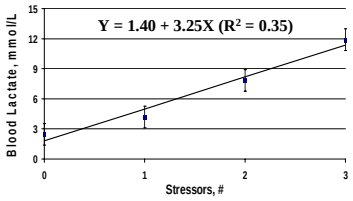
Prepare Pigs for Transport

- Walk pens daily
- Routinely move pigs prior to loading
- Pre-sort pigs prior to loading (if feasible)
- Remove feed prior to loading (if feasible)

ELANCO
SBU2164

Minimize Stress

- Aggressive handling, restricted transport floor space, and long distance moved treatments had ***additive effects*** on rectal temperature, blood acid-base balance, and loin muscle lactate values (Ritter et al., 2007)



Removing just one stressor will improve the pig's well-being!

ELANCO Study # T2F170606

ELANCO
SBU2164

Minimize Stress at the Farm

- Preparation
  - Make sure there is adequate lighting
  - Spread an absorbent material on the floor
  - Drop curtains and turn fans down prior to loading
  - Have a hose ready to shower pigs in the summer
- Communication
  - Loading crew and truck driver determine load size
  - Adjust load size for pig weight, trailer length, weather

ELANCO
SBU2164

Minimize Stress at the Farm

- Minimize the distance pigs are moved during loading
- Loading strategy
  - Front of barn loaded onto top deck
  - Back of barn loaded onto bottom deck
- Develop a plan for handling fatigued/injured pigs
  - Designate a recovery pen/area
  - Use a sled to move non-ambulatory pigs
- Everyone loading must have a sorting board

ELANCO
SBU2164

Minimize Stress at the Farm

- Use paddles and sorting boards to sort pigs from pens
  - Do not use electric prods in the pen
- Minimize the use of electric prods during loading
  - Only the person by the barn door should have a hot shot
  - Goal: ≤ 2 shocks/pig from barn pen to trailer compartment
- Move pigs in groups of 4 to 6 pigs at a slow/calm pace
  - Optimal group size is dependent upon pig weight and aisle width
  - Rule of thumb: you need to be able to reach the first pig
  - If pigs are difficult to load, take fewer pigs to the truck

ELANCO
SBU2164

Minimize Stress at the Farm

- If pigs are showing signs of stress or having difficulties walking, place them in a recovery pen and allow them to rest and recover
- Use a sled to move non-ambulatory pigs to the rest pen (NPB, 2004)


(Photos courtesy of the National Pork Board's TQA Handbook, 2004)

- If pigs have not recovered after 2 to 3 hours of rest, these pigs should be euthanized to prevent distress

National Pork Board. 2004. Trucker Quality Assurance Handbook. C. Stahl, ed. National Pork Board, Des Moines, IA.

ELANCO
SBU2164

Top 10 Loading Mistakes

- Not discussing pig weight and load size prior to loading
- Using hot shots in the pen
- Handler or driver is not using a sorting board
- Getting in a hurry - filling the aisle full of pigs
- Taking too many pigs from the pen to the truck

ELANCO SBU2164

Top 10 Loading Mistakes

- Not shocking the right pig at the right time
- Not allowing pigs enough time to respond to the hot shot
- Tapping/shocking pigs while they are moving good
- Walking down the aisle while pigs are approaching
- Not willing to adjust when things are not working

ELANCO SBU2164

Minimize Stress during Transport

- Do not mix unfamiliar pigs (if feasible)
- Use the following transport floor space recommendations

Weight	Floor Space
250-275 lbs	5.00 ft^2/pig
275-300 lbs	5.25 ft^2/pig

- Optimize the environment inside the trailer
  - Summer: shower pigs immediately prior to transport
  - Winter: provide adequate bedding and board up the trailer
- Keep the truck moving and avoid unnecessary stops

ELANCO SBU2164

Overall Summary

- Transport losses represent growing animal welfare, legal, and economic concerns to the U.S. swine industry
- ~0.6% of all pigs transported die or become non-ambulatory
- Transport losses are a multi-factorial problem
- It is well established that transport losses are increased by:
  - Aggressive handling
  - Porcine stress syndrome (stress gene)
  - Crowding pigs during transport
  - Extreme weather conditions
- Pre-slaughter stressors have additive effects in pigs
- Transport losses can be minimized by better preparing pigs for transport and minimizing stress during the marketing process

ELANCO SBU2164

Free Monthly E-Newsletter

Hog-Handling Update
By Dr. Matt Ritter
TIPS FOR BETTER PIG HANDLING

To subscribe go to:
www.hoghandlingupdate.com

ELANCO SBU2164