Never Stop Improving

Animal Husbandry Skills for Better Handling

Saskatchewan Pork Industry Symposium 2019

Nat Stas M.S.
PIC North America
Leading up to loading

• Walk pens daily, allowing pigs to get used to you but making them respect your space
• Minimize stressful events (vaccination, treatments, etc.)
• Allow pens of pigs to walk aisles days before shipping
• Feed withdrawal can help with pig movement
• Pre-sort pigs for market if space allows (large pens 80+)
• Prepare route and acquire necessary tools
• Prepare load plan for each compartment (Driver is apart of the team and needs to know the plan)
Receiving/Load-out Biosecurity
It is easier to keep diseases out than to remove them from an infected site

• Clean, disinfected trucks – who inspects? Where?
• Clean, disinfected chutes
• Clean/dirty line – one way flow
• Disinfection protocol that includes dilution rates and cold weather accommodations
Keys to Success

- Recognize the need for improved handling and Transport
- Understand the pig
- Properly designed facilities & trucks
- Plan for moving/loading pigs according to conditions
- Properly trained people
The Cost of Poor Handling/Transport

- Stressed/fatigued pigs (NA, DOA, PSE)* - Welfare
- Injuries (damaged skin, bruises, broken bones) - Welfare
- Trim loss = lower HCW* (decreased income)
- Compromised pigs that:
  - never leave the farm
  - are sold to a secondary market
  - never make it to the stunner

* NA = Non Ambulatory (downer)
* DOA = Dead on Arrival.
* PSE = Pale, Soft and Exudative (meat quality problem)
* HCW = Hot Carcass Weight
Estimated Cost of Poor Handling*

Transport

$31,694,000

Lairage

$23,770,500

Bruises

$0.08 / pig

Color

$0.43 / pig

PSE

$0.90 / pig

“Total lost opportunity for the U.S. swine industry of $2.44 per finisher head per year, or $254,104,500.00.”
Handling and Transport Stresses Have an Additive Effect*

Over a given period of time, the pig is exposed to one stressor after another and the animal does not have time for its body to return to baseline.

Each time a new stressor is added the stress response of the animal continues to become more intense.

*Handling and Loadout of the Finisher Pig, Jeff Hill, PSF, Anna K. Johnson, ISU
Understand the Pig – The Science

• Senses
  • Vision, Smell, Hearing
• Curiosity
• Flight response
• Herd tendencies
• Good memory
• Temperature response
  • High temperatures increase the chance of fatigued pigs
  • Temperature extremes, both hot and cold, impact animal well being

Understanding the Pig – The Art

• Read the pigs - observe & recognize
  • Signs of stress
  • Health challenges/injuries
• Anticipate -
  • Recognize & remove distractions
  • Be in position
• Open road – pathway should be obvious to the pig and as distraction free as possible
• Application/release of pressure
• Know when to say “no” to moving/loading a pig.
**Vision, Hearing and Smell**

**Smell:** well developed, used to investigate

**Hearing:** well developed, sensitive to sudden, loud noises (threat?)

**Binocular Vision**
Narrow with relatively poor distance & depth perception

**Monocular Vision**
To the side has priority is used to detect danger, food, other pigs, and escape routes

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Picture: “Smart Pig Handling – Basic Pig Behavior,” Manitoba Pork Council
Pigs’ Instincts

Work with them, not against them

Flight Response

• Normal response to a perceived threat is a larger flight zone
• Keep visual contact with potential threat
• Circling – without an escape route pigs tend to circle to keep a perceived threat in sight and at a distance

Herd Tendencies

• Social animals who prefer to be with friends/pen mates
• Visual & physical contact with group
• Move as a group rather than single file
• The group provides protection against a threat
Flight Zone
Each pig’s flight zone is different based on size, age & experience

The sum of the flight zones creates a “bubble” around the handler.
## Summary of Group Movement Patterns

<table>
<thead>
<tr>
<th>GROUP PATTERN</th>
<th>EMOTIONAL STATE</th>
<th>EFFECT ON MOVEMENT</th>
<th>PRESSURE and/or RELEASE</th>
<th>ATTENTION &amp; RESPONDING TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW</td>
<td>Calm</td>
<td>Easiest movement</td>
<td>Being given release</td>
<td>Herd movement</td>
</tr>
<tr>
<td>BUNCH</td>
<td>Fearful or Defensive</td>
<td>Kills movement</td>
<td>Blocked from getting release</td>
<td>Handler</td>
</tr>
<tr>
<td>CIRCLE</td>
<td>Fearful or Defensive</td>
<td>Opposite direction of pressure Accelerates</td>
<td>Taking release by circling out of handler’s pressure</td>
<td>Handler</td>
</tr>
</tbody>
</table>
Tools of the Trade

Tools extend reach and expand the handler’s bubble

**Common tools**
- Physical Barrier – sorting board (essential)
- Visual Barrier – cape, sorting board
- Audio Stimulant – rattle can or rattle paddle
- Visual Stimulant – flag
- Electric Prod – limited use tool of last resort; not recommended by PIC

**PPE Recommended by PIC**
- Sorting Board
- Steel toe boot/shoes
- Ear protection
- Gloves
- Glasses (optional)
Use of “Pressure” in Pig Handling

**Pressure** – action that increases the level of attention a pig feels they need to dedicate to their handler.

- Entering the pig’s flight zone
- Making reasonable noise
- Presenting a visual stimulus
- Lightly touching the pigs

Too much pressure, constant pressure and/or pressure at the wrong time can have a negative impact on pig movement.
Pressure and Circling

X Trying to push the pigs out of a pen results in them looking at the handler(s) rather than the exit...

+ Correct handler positioning and application of pressure promotes a calm exit from the pen

Use your bubble
Movement by Design
Barns, Ramps & Trucks

• Pen gates - large enough for the pigs to see the way out (1.8 – 2.4 m)
• Walkways/Doors/Ramps - minimum of two pigs wide (92 – 102 cm)
• Open corners instead of 90° (blind) turns
• Lighting – consistent, sufficiently bright (± 85 lux), diffused to minimize glaring and shadows
• Flooring – anti-slip, minimize changes in type, texture & color
• Ramps – properly sized/spaced cleats (2.5cm x 2.5cm cleats on 20cm centers)
• Travel distance – shorter is better (blood lactate (mmol/L) almost triples from 25m to 125m and is almost 6x higher with aggressive handling) (ELANCO study +T2F170606)
Group Size

Handler’s considerations
- Reaching the lead pig
- Right tools
- Maintain flow
- # pigs based in Pig type

<table>
<thead>
<tr>
<th>Pig Type</th>
<th>Pigs/person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weaned Pigs</td>
<td>20</td>
</tr>
<tr>
<td>Nursery Pigs</td>
<td>20</td>
</tr>
<tr>
<td>Finished /Market Pigs</td>
<td>3-5</td>
</tr>
</tbody>
</table>
Group Size Impact

- Reduce load time
- Non-ambulatory pigs at the farm
- DOAs and non-ambulatory pigs at the plant
Minimize Transitions/Distractions
Maintaining flow

• Managing the transitions (changes) on the route from the pen to the truck is a key part of a good movement plan
• Changes in lighting, flooring, temperature, humidity, air speed and air flow direction can each negatively impact pig movement as the pigs will stop to investigate
Market Hog Loading Chute Basics

- Minimum width of 2 pigs (92cm - 102cm)
- 20° Maximum incline, <15° is recommended
- Level area at each end of the ramp
- Good seal to truck
- Regular maintenance of the ramp and truck approach
- Non slip surface with properly sized & spaced cleats (2.5cm tall 20cm apart; 8cm-10cm spacing for nursery pigs)
**Effect of Weight and Temperature on Stocking Density**

**Heavy Hogs & High Temperatures**

- Heavier slaughter weight = more space per pig
- Higher temperatures = more space per pig
- Research indicates that a load density of 268 to 283 kg/m² helps reduce transport losses*
- PIC recommends adjusting load density based on weight and temperature
- Additional transport costs may be offset by reduced downers and DOAs

**Example of Calculator**

<table>
<thead>
<tr>
<th>Weight / kg</th>
<th>kg/m²</th>
<th>27° - 32°C</th>
<th>&gt;32°C</th>
<th>&gt;32°C &amp; &gt;400 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>0.39</td>
<td>0.43</td>
<td>0.47</td>
<td>0.56</td>
</tr>
<tr>
<td>115</td>
<td>0.41</td>
<td>0.45</td>
<td>0.49</td>
<td>0.58</td>
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<tr>
<td>120</td>
<td>0.42</td>
<td>0.47</td>
<td>0.51</td>
<td>0.61</td>
</tr>
<tr>
<td>125</td>
<td>0.44</td>
<td>0.49</td>
<td>0.53</td>
<td>0.64</td>
</tr>
<tr>
<td>130</td>
<td>0.46</td>
<td>0.51</td>
<td>0.55</td>
<td>0.66</td>
</tr>
<tr>
<td>135</td>
<td>0.48</td>
<td>0.52</td>
<td>0.57</td>
<td>0.69</td>
</tr>
<tr>
<td>140</td>
<td>0.49</td>
<td>0.54</td>
<td>0.59</td>
<td>0.71</td>
</tr>
<tr>
<td>145</td>
<td>0.51</td>
<td>0.56</td>
<td>0.61</td>
<td>0.74</td>
</tr>
<tr>
<td>150</td>
<td>0.53</td>
<td>0.58</td>
<td>0.64</td>
<td>0.76</td>
</tr>
</tbody>
</table>

*Elanco Hog-Handling Update, Issue 7
Pigs Per Compartment
Each trailer configuration should be calculated individually.

Charts with the maximum pigs per compartment at common market weights can be attached to each trailer for load consistency.

### Metric Reference
- $53ft^2 = 4.9m^2$
- $78ft^2 = 7.3m^2$
- $80ft^2 = 7.4m^2$
- $4,619lb = 2,095Kg$
- $4,523lb = 2,052Kg$
- $3,068lb = 1,392Kg$

### SQUARE FOOTAGE

<table>
<thead>
<tr>
<th>Section</th>
<th>Calculation</th>
<th>Pounds per Pen</th>
<th>Pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>L</td>
<td>Square Feet</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td>Section 1</td>
<td>8</td>
<td>9.8</td>
<td>81</td>
</tr>
<tr>
<td>Section 2</td>
<td>8</td>
<td>9.5</td>
<td>80</td>
</tr>
<tr>
<td>Section 3</td>
<td>8</td>
<td>9.5</td>
<td>80</td>
</tr>
<tr>
<td>Section 4</td>
<td>8</td>
<td>9.4</td>
<td>78</td>
</tr>
<tr>
<td>Section 5</td>
<td>4</td>
<td>12.6</td>
<td>53</td>
</tr>
<tr>
<td>Section 6</td>
<td>8</td>
<td>9.8</td>
<td>81</td>
</tr>
<tr>
<td>Section 7</td>
<td>8</td>
<td>9.5</td>
<td>80</td>
</tr>
<tr>
<td>Section 8</td>
<td>8</td>
<td>9.5</td>
<td>80</td>
</tr>
<tr>
<td>Section 9</td>
<td>8</td>
<td>9.4</td>
<td>78</td>
</tr>
<tr>
<td>Section 10</td>
<td>4</td>
<td>12.6</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>743</strong></td>
<td><strong>43052.2</strong></td>
<td><strong>154</strong></td>
</tr>
</tbody>
</table>
### Recommended Truck Setup Procedures Based on Air Temperatures (Market Pigs)

<table>
<thead>
<tr>
<th>Estimated Air Temperature</th>
<th>Bedding* (recommended bags/trailer)</th>
<th>Side-Slats</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤10°F (-12°C)</td>
<td>Heavy (6 bags)</td>
<td>90 - 95% closed</td>
</tr>
<tr>
<td>11 – 20°F (-11.7 &amp; -6.6°C)</td>
<td>Heavy (4-6 bags)</td>
<td>75 - 90% Closed</td>
</tr>
<tr>
<td>21 – 30°F (-6.1 &amp; -1.1°C)</td>
<td>Heavy (4-6 bags)</td>
<td>50 - 75% Closed</td>
</tr>
<tr>
<td>31 – 40°F (-0.6 &amp; 4.4°C)</td>
<td>Medium (3-4 bags)</td>
<td>50 - 75% Closed</td>
</tr>
<tr>
<td>41 – 60°F (5 &amp; 15.6°C)</td>
<td>Medium (3-4 bags)</td>
<td>25 - 50% Closed</td>
</tr>
<tr>
<td>61 – 90°F (16 &amp; 32.2°C)</td>
<td>Medium (3-4 bags)</td>
<td>0% Closed</td>
</tr>
<tr>
<td>&gt; 90°F (32.2°C)</td>
<td>Light (1-2 bags)</td>
<td>0% Closed</td>
</tr>
</tbody>
</table>

*Bedding refers to a 50 pound bale of wood shavings

The ideal amount of floor coverage from 1, 3, and 5 bags of bedding on a 53 foot trailer. Note that this is the desired coverage at the time of loading. Photos courtesy of Eby.
## Take Home - Key Indicators

- Plan for moving/loading pigs according to conditions
- Remember Flight Zone & Pressure and Circling concepts during handling
- Plan for transport based in kg/m\(^2\) calculator and weather conditions
- Remember important pig handling indicators:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pig</td>
<td>Signs of Handling/ Transport Problems: NA, DOA, Injures, PSE, Trim Loss</td>
</tr>
<tr>
<td></td>
<td>Signs of Fatigued Pigs: Open mouthed breathing, discolored skin, vocalization, fall behind, refuse to walk</td>
</tr>
<tr>
<td></td>
<td>Understand the pig: Senses (vision, smell, hearing), curiosity, flight response, good memory</td>
</tr>
<tr>
<td>Barn</td>
<td>Pen gates: 1.8m - 2.4m minimum width in finishers</td>
</tr>
<tr>
<td></td>
<td>Walkways: Minimum of two pigs wide 92cm - 102cm Solid pen fronts in near doors</td>
</tr>
<tr>
<td></td>
<td>Lighting: Consistent, sufficiently bright (± 85 lux)</td>
</tr>
<tr>
<td></td>
<td>Corners: Open instead of 90°(blind)</td>
</tr>
<tr>
<td></td>
<td>Doors: Minimum of two pigs wide</td>
</tr>
<tr>
<td>Ramps</td>
<td>Slope: As flat as possible – 25°incline maximum for movable ramps / 20°or less recommended (15°- 17°preferred)</td>
</tr>
<tr>
<td></td>
<td>Cleats: Correctly sized/spaced – 2.5cm x 2.5cm cleats on 20cm centers</td>
</tr>
<tr>
<td></td>
<td>Safety: People should have a separate path, tall sides, good seal to truck. Enclosed chute can reduce distractions</td>
</tr>
<tr>
<td></td>
<td>Transition to truck: Smooth– height &amp; width should be the same as that of the truck door</td>
</tr>
<tr>
<td></td>
<td>Width: 92cm - 102cm for non-divided chutes</td>
</tr>
</tbody>
</table>
Thank You!
QUESTIONS?

Questions: nat.stas@genusplc.com
Information Resources

Transport Quality Assurance (TQA) Program

Pork Information Handbook (PIH) and Pork Information Gateway (PIG)
- [http://www.porkgateway.org](http://www.porkgateway.org)

Manitoba Pork

Temple Grandin
- [http://www.grandin.com](http://www.grandin.com)

PQA Plus
- [https://d3fns0a45ggc1a.cloudfront.net/sites/all/files/documents/PQAPlus/V3.0/BinderMaterial/Tab%202/2%20PQAhandbookSPANISH.pdf](https://d3fns0a45ggc1a.cloudfront.net/sites/all/files/documents/PQAPlus/V3.0/BinderMaterial/Tab%202/2%20PQAhandbookSPANISH.pdf)

EU Loading/Unloading Guidelines