A new way forward in producing pork
What is it?

• IMPROVEST (*gonadotropin releasing factor analog–diphtheria toxoid conjugate*) is an FDA-approved, veterinary prescription product that is a safe and effective alternative to surgical castration to manage boar taint.

• FDA-approved, IMPROVEST is for the temporary immunological castration (suppression of testicular function) and reduction of boar taint in intact male pigs intended for pork.
How it works

- IMPROVEST is a protein compound that works like an immunization.
- It uses the pig’s own immune system to temporarily create the same effect as surgical castration, but much later in the male pig’s life.
What causes off odor in male pigs?

GnRF travels to Pituitary

Hypothalamus produces GnRF

Liver

Large intestine

Testes

LH

FSH

Skatole

Steroids
  • Fertility
  • Libido
  • Behavior

Androstenone
Mode of Action – Immunological Castration

Hypothalamus produces GnRF

GnRF travels to Pituitary

Anti-GnRF antibodies

GnRF travels to Pituitary

Liver

Large intestine

Testes

Results in same impact on meat quality as surgical castration

Skatole

Androstenone

Steroids
• Fertility
• Libido
• Behavior

Immunological Castration
• Efficacy
• Safety
  – Animal safety
  – Food safety
  – Environmental safety
  – Manufacturing safety

• Agricultural Marketing Service
  – Market classification - Barrow
• Food Safety and Inspection Service
  – Inspection classification
FDA-approved as safe and effective

No residues in the meat from IMPROVEST that could affect human health\(^1\)

Approved as safe and effective in 63 other countries, including the European Union and Japan, under the global related brand, IMPROVAC\(^\circledR\)

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What it is not

• Not a hormone or growth promotant
  – IMPROVEST antigen has no intrinsic hormonal activity\(^1\)
  – It is an incomplete protein analogue of GnRF
• Not added to the feed
• Not genetically modified
• Not chemical castration

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It’s effective

- It’s as effective as surgical castration at reducing off odor (unpleasant smell) in pork\(^1,2\)
- Temporary effect
- Veterinary prescription only
- IMPROVEST is not for use in female pigs, barrows or in male pigs intended for breeding

2. IMPROVAC is the related global brand
Quality attributes

- The quality is consistent with the high quality pork we enjoy today
- Consumers representative of the US population could not differentiate between pork from pigs given IMPROVEST and surgically castrated pigs¹

Capturing more value from male pigs

• Male pigs are given IMPROVEST later in the finishing phase to manage off odors, eliminating the need for surgical castration

• As a result, they’re able to grow to their full intact male potential, with all the inherent advantages until the second dose
Capturing more value from male pigs

- Increased feed efficiency
  - 6 to 10% improvement\(^1\)
- Improved cutout yield
  - 2 to 2.5% increase\(^2\)

A research summary of:

“Effects on performance characteristics of immunologically castrated male pigs using different levels of lysine in the diets”


Kansas State University

and

D.M. Meeuwse, V.L. King, P.L. Runnels, J.P. Crane

Pfizer Animal Health
Study objectives

• Demonstrate performance differences between surgically castrated males, intact males and pigs receiving IMPROVEST® (gonadotropin releasing factor analog – diphtheria toxoid conjugate)

• To determine the effect on performance and carcass characteristics of different levels of lysine in diets of male pigs receiving IMPROVEST
Study methodology

• Animals
  – PIC 337 x PIC 1050
  – Pigs allotted to treatment at 7 days of age in a randomized complete block design
  – Weight and finisher location as blocking factors
  – Barrows castrated within 3 days of allotment
  – Weaning considered treatment day 0
  – 12.8 lb (5.8 kg) average weaning weight

• Housing
  – Pigs were housed 25 per pen
  – Feed and water available ad-libitum
  – 6 treatments with 8 pens/treatment
SID lysine treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Lysine regimen</th>
<th>Percent lysine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day 55-76</td>
</tr>
<tr>
<td>Barrows</td>
<td>Low</td>
<td>1.04</td>
</tr>
<tr>
<td><strong>IMPROVEST</strong></td>
<td>Low</td>
<td>1.04</td>
</tr>
<tr>
<td><strong>IMPROVEST</strong></td>
<td>Med low</td>
<td>1.13</td>
</tr>
<tr>
<td><strong>IMPROVEST</strong></td>
<td>Med high</td>
<td>1.22</td>
</tr>
<tr>
<td><strong>IMPROVEST</strong></td>
<td>High</td>
<td>1.31</td>
</tr>
<tr>
<td>Boars</td>
<td>High</td>
<td>1.31</td>
</tr>
</tbody>
</table>

Approx. wt, lb:
- 66-110 lbs (30-50 kg)
- 110-143 lbs (50-65 kg)
- 143-203 lbs (65-92 kg)
- 203-287 lbs (92-130 kg)

Corn-soybean meal and synthetic amino acid diets with 1% added fat to day 94 (3.54 Mcal ME/kg) and no added fat after day 94 (3.48 Mcal ME/kg)
Findings

• Boars & pigs given IMPROVEST had lower feed intake & better feed-to-gain vs. barrows

• Compared to barrows, pigs given IMPROVEST had better feed efficiency

• Increasing lysine in the diet above barrow diets resulted in:
  – Improved average daily gain
  – Improved estimated lean percent
Results: Improved feed efficiency

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Lysine regimen</th>
<th>Avg. Daily Gain (lbs)</th>
<th>Average Feed Intake (lbs)</th>
<th>Feed Efficiency (F/G)</th>
<th>Body Weight (lbs), Day 160</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrows</td>
<td>Low</td>
<td>1.96&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.37&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.66&lt;sup&gt;a&lt;/sup&gt;</td>
<td>276.1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>Low</td>
<td>2.03&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>5.08&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.42&lt;sup&gt;b&lt;/sup&gt;</td>
<td>281.6&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>Med low</td>
<td>2.12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.19&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>2.40&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>289.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>Med high</td>
<td>2.12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.31&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.41&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>291.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>High</td>
<td>2.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.10&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.41&lt;sup&gt;b&lt;/sup&gt;</td>
<td>286.0&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>Boars</td>
<td>High</td>
<td>2.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.81&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.24&lt;sup&gt;c&lt;/sup&gt;</td>
<td>286.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Means within a row differ (P < 0.05)
## Results (cont.): Opportunity for higher lean content

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Lysine regimen</th>
<th>Carcass Yield, %</th>
<th>Average Carcass Weight (lbs)</th>
<th>FOM Back Fat (inches)</th>
<th>FOM Loin Depth (inches)</th>
<th>FOM Lean, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrows</td>
<td>Low</td>
<td>74.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>204.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.76&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.61&lt;sup&gt;b&lt;/sup&gt;</td>
<td>55.1&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>Low</td>
<td>71.7&lt;sup&gt;cd&lt;/sup&gt;</td>
<td>199.3&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.75&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.54&lt;sup&gt;c&lt;/sup&gt;</td>
<td>55.0&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>Med low</td>
<td>72.0&lt;sup&gt;bcd&lt;/sup&gt;</td>
<td>208.8&lt;sup&gt;abc&lt;/sup&gt;</td>
<td>0.73&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>2.67&lt;sup&gt;a&lt;/sup&gt;</td>
<td>55.7&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>IMPROVEST</td>
<td>Med high</td>
<td>72.5&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>210.76&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.71&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.69&lt;sup&gt;a&lt;/sup&gt;</td>
<td>56.1&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>IMPROVEST</td>
<td>High</td>
<td>73.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>208.3&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.66&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.71&lt;sup&gt;a&lt;/sup&gt;</td>
<td>57.0&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Boars</td>
<td>High</td>
<td>71.3&lt;sup&gt;d&lt;/sup&gt;</td>
<td>204.8&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>0.57&lt;sup&gt;d&lt;/sup&gt;</td>
<td>2.67&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>58.2&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Means within a row differ (P < 0.05)
6 studies – Production Parameters

• Studies conducted in large commercial barns with ability to feed and track multiple treatments
• Studies with multiple report numbers were fed different diets to each group or had multiple harvest points
• SC = Surgical castrates
• IC = Improvest (immunocastrates)
Wean to Finish Average Daily Gain

<table>
<thead>
<tr>
<th>Project</th>
<th>IC</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>803</td>
<td></td>
<td></td>
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<tr>
<td>828-03</td>
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<td>828-02</td>
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<td>775</td>
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<tr>
<td>706-05</td>
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<td>706-04</td>
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<td>706-03</td>
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<td>706-02</td>
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<td>779</td>
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</tbody>
</table>

Daily Gain, lb

- IC
- SC
Wean to Finish Percent Improvement in Average Daily Gain

<table>
<thead>
<tr>
<th>Project</th>
<th>% Change in ADG</th>
</tr>
</thead>
<tbody>
<tr>
<td>803</td>
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<tr>
<td>828-03</td>
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<tr>
<td>746</td>
<td></td>
</tr>
<tr>
<td>779</td>
<td></td>
</tr>
</tbody>
</table>
Feed Conversion

Project

803
828-03
828-02
775
706-05
706-04
706-03
706-02
776
746
779

Feed/Gain

1.8  2  2.2  2.4  2.6  2.8

IC  SC
Wean to Finish Percent Improvement in Feed Conversion

<table>
<thead>
<tr>
<th>Project</th>
<th>Feed conversion improvement, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>803</td>
<td></td>
</tr>
<tr>
<td>828-03</td>
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<td>828-02</td>
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<td>746</td>
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</tr>
<tr>
<td>779</td>
<td></td>
</tr>
</tbody>
</table>
A research summary of:

“Effects of immunization against GnRF on carcass characteristics, pork quality, and further processing characteristics of finishing male pigs”

D.D. Boler, F.K. McKeith, J. Killefer

University of Illinois
Animals

- 96 male finishing pigs
- Selected from a population of approximately 1,200 head
- Involved evaluation of barrows, immunized males and boars
- Evaluated different dietary lysine levels
Methodology: Three groups, six treatments

- **Barrows**
  - T1

- **Immunized males**
  - T2
  - T3
  - T4
  - T5

- **Boars**
  - T6
Findings

• Increasing lysine level increases fat-free lean and cutting yields of immunized males

• Immunization had no impact on pork quality measures that were reported

• Immunization did not effect further processed product quality
## Treatment group and diet schedule

<table>
<thead>
<tr>
<th>Period</th>
<th>Pig age (wks)</th>
<th>Study day</th>
<th>Pig wt (kg)</th>
<th>Percent lysine in diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>T1</strong> Barrows Low</td>
</tr>
<tr>
<td>Grower</td>
<td>6</td>
<td>24</td>
<td>22.70</td>
<td>1.2</td>
</tr>
<tr>
<td>Developer</td>
<td>11</td>
<td>59</td>
<td>45.40</td>
<td>1.0</td>
</tr>
<tr>
<td>1\textsuperscript{st} Finisher</td>
<td>16</td>
<td>94</td>
<td>68.10</td>
<td>0.8</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Finisher</td>
<td>20</td>
<td>122</td>
<td>90.80</td>
<td>0.7</td>
</tr>
<tr>
<td>Slaughter</td>
<td>25</td>
<td>157</td>
<td>120.31</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>T2</strong> Immunized Low</th>
<th><strong>T3</strong> Immunized Low/ Med</th>
<th><strong>T4</strong> Immunized High/ Med</th>
<th><strong>T5</strong> Immunized High</th>
<th><strong>T6</strong> Boars High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grower</td>
<td>1.2</td>
<td>1.3</td>
<td>1.4</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Developer</td>
<td>1.0</td>
<td>1.1</td>
<td>1.2</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>1\textsuperscript{st} Finisher</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Finisher</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Slaughter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Carcass characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>T1 Barrows</th>
<th>T2 Immunized</th>
<th>T3 Immunized</th>
<th>T4 Immunized</th>
<th>T5 Immunized</th>
<th>T6 Boars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live wt, kg</td>
<td>125.79a</td>
<td>126.67ab</td>
<td>132.14cd</td>
<td>133.85d</td>
<td>130.30cd</td>
<td>129.62bc</td>
</tr>
<tr>
<td>HCW, kg</td>
<td>91.97a</td>
<td>90.61a</td>
<td>93.82ab</td>
<td>96.38b</td>
<td>92.18a</td>
<td>90.93a</td>
</tr>
<tr>
<td>Dressing, %</td>
<td>73.12a</td>
<td>71.53bc</td>
<td>71.03bc</td>
<td>72.00ab</td>
<td>70.71bc</td>
<td>70.14c</td>
</tr>
<tr>
<td>Loin Eye Area, cm²</td>
<td>44.69a</td>
<td>46.79ab</td>
<td>46.76ab</td>
<td>48.47b</td>
<td>48.56ab</td>
<td>48.45b</td>
</tr>
<tr>
<td>Backfat, cm</td>
<td>2.42a</td>
<td>2.32a</td>
<td>2.52a</td>
<td>2.13a</td>
<td>2.22a</td>
<td>1.54b</td>
</tr>
</tbody>
</table>

Means within a row differ (P < 0.05)
Carcass characteristics: Increasing lysine improves lean cut-out yields

<table>
<thead>
<tr>
<th>Item</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1 Barrows</td>
</tr>
<tr>
<td>¹Lean cut yield, %</td>
<td>61.51&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>²Carcass cut yield, %</td>
<td>73.70&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bnls lean cut yield, %</td>
<td>37.13&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bnls carcass cut yield, %</td>
<td>49.32&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

¹Lean cutting yield = ((trimmed ham + trimmed loin + Boston + picnic) / side wt)*100
²Carcass cutting yield = ((lean cutting yield + trimmed belly) / side wt)*100

Means within a row differ (P < 0.05)
Capturing more value from male pigs

- IMPROVEST eliminates the risk associated with surgical castration
  - 1.6 % lower piglet mortality\(^1\)
- Pigs given IMPROVEST behave similarly to barrows\(^2,3\)

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Pigs given IMPROVEST behave similarly to barrows\textsuperscript{2,3}

Intact males

Pigs given IMPROVEST
Capturing more value from male pigs

- Decreased carbon footprint
  - Production efficiencies gained by allowing male pigs to grow longer as intact males creates less waste which reduces their environmental impact
  - 3.6% in potential reduction to the carbon footprint of pork production has been estimated for the related global brand IMPROVAC (measured in CO$_2$ equivalent per kg of pig live weight)$^1$

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Environmental attributes

Impact of U.S. pork production is relatively low (0.33 percent of the total U.S. greenhouse gas emissions).\(^1\) Yet, incremental reductions remain a high priority.

If half the male pigs in the U.S. were raised using IMPROVEST, it would be like removing the CO\(_2\) equivalent of 130,000 cars for a year from our roads.\(^2,3\)

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What is the veterinarian’s role?

- Prescribe product
- Standardized application training from Pfizer
- After training is complete, veterinarians invited to be part of application process
Quality assurance and traceability

- Successful international experience with process-control teams
  - Verified, certified process
  - Prescription product
  - Administered only by trained and certified personnel
  - Full traceability and audit compliant system

- 100% compliance is the target
  - Every male pig must receive two full doses

- Priming Dose: After 9 wks age
- 2nd Dose: At least 4 wks after priming dose
- QA Inspection: At least 2 wks after 2nd dose
- Market Window: 4 – 8 wks after 2nd dose
- QA Certificate: Delivered with each load of animals marketed
Certification process from farm to market

- Valid veterinarian prescription for pig flow
- Certified, trained technicians, tracked dosing
  - 1\textsuperscript{st} dose (priming dose): At least 9 weeks of age
  - 2\textsuperscript{nd} dose: 4 to 8 weeks prior to harvest
  - Real-time data tracking with smart phones
- Quality Assurance Supervisor inspection
  - Two weeks after 2\textsuperscript{nd} dose
  - Identify and re-dose any animals that were mis-dosed
- Quality Assurance Certificate issued and delivered with animals
  - Certified, verified process with audit capability
- Potential USDA Process Verified Program
Worker safety first

All personnel handling the product will be trained to:

- Work with pigs in the finisher unit
- Understand safety measures
  - Special care should be taken to avoid accidental self injection during administration of IMPROVEST. Accidental self injection could negatively affect reproductive physiology of both men and women. Therefore, pregnant women should not administer IMPROVEST and women of childbearing age and men should exercise extreme caution when administering the product
  - There is no risk, however, of this effect on an individual that consumes pork from pigs given IMPROVEST
Technical training

- Web-based audio-visual training
- Injection technician training
  - Introduction
  - Product Detail
  - Biosecurity
  - Care and Use of the Injector Equipment
  - Administration Technique
  - Professional Behavior
  - Safety
- QA supervisor training
  - How to Do a Quality Assurance Check
  - How to Ensure an Injection Technician is Ready to Inject (in barn test)
  - Global Vet Link Training Videos
- Spanish version also available
## Tracking and certification

<table>
<thead>
<tr>
<th>Internet Web based Training</th>
<th>IMPROVEST Prescription Tracking</th>
<th>Production Data Interface</th>
<th>Field Team Data</th>
<th>Processing Plant QC Data</th>
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<tbody>
<tr>
<td>✓ Interactive web-based data and process flow management</td>
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<td>✓ Secure password protected paperless system (smart phones)</td>
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<tr>
<td>✓ Output is certified, process verified Improvest pigs to plant</td>
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<td>✓ Full tracking of all treated pigs</td>
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<td>✓ Real-time audit capability</td>
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Global Vet Link system

1. Creates full certification of verified process
2. Eliminate paper checklists/reports
3. Reduce data entry – capture live
4. Reduce data system redundancies
5. Web-based – document control/updates
6. Flexible to different system application structures
7. Efficient communications
4-step quality assurance tracking

1. Import Customer Data (# of pigs placed at a site)

2. Scheduling (weekly task list for field team leader)

3. Smartphone to capture real-time data (pigs dosed, time in/out, needles used etc.)

4. Certificate of each truckload of pigs
How does this change swine production and packing plant operations?

**Production**
- Live production
  - Eliminate surgical castration
  - Raising young intact male pigs for improved efficiency
  - Potential changes in feeding and nutrition
  - Improved animal evaluation at live site prior to shipping

**Packer**
- Packing plant
  - Plant operations – testicle removal
  - Additional variety meats/ organs or byproducts
  - Greatly reduces risk of off odors due to cryptorchid animals going to market

**USDA**
- USDA FSIS
  - Ante mortem inspection
  - Post mortem inspection
  - FSIS training and standardization between plants
Creating chain acceptance through Key Opinion Leader support

IMPROVEST
a safe, sustainable option for managing off odors to ensure pork quality

Consumers (only as needed)

Retailers

Packers/ Processors
Communication Resources for Early Adopters

Agriculture
DVMs
Physicians & Food safety
Animal behavior
Environmental
Food chain

Communication and Outreach

Scientific Reports and Consumer Research

Foundation in Science: Safety, Welfare, Economics, Environment, Quality
Conducted extensive consumer market research: Most consumers are apathetic

• Vast majority of consumers apathetic:
  – Unaware of odor issue; Uninterested in additional details or information
  – “Why are you talking with me about this?”

• For the minority who are interested:
  – Human food safety is the primary question/concern
  – Key facts on human food safety bring about positive movement

• To best be prepared:
  – Direct, aggressive consumer “education” appears unwarranted
  – Be ready with understandable facts
  – Lay a foundation of food safety reassurance via credible experts and respected authorities
Consumer market research finds majority of consumers not interested

Do they care?
80% not interested in mock New York Times IMPROVEST article

When forced to read about IMPROVEST, what is their reaction?
80% are not concerned

What actions are they likely to take?

Likely Actions
Percent of total respondents

- Nothing: 59%
- Online search: 15%
- Contact FDA: 6%
- Contact grocer/butcher: 6%
- Contact food safety group: 6%
- Eat less pork: 7%
- Contact manf.: 2%

Methodology
- Research conducted by Gallup & Robinson
- U.S. pork consumers, who eat pork at least 2x/month
- Three-phase study
- Quantitative & qualitative
Questions?

THANK YOU!