The Sustainable Pork

NIAA Swine Committee
March 24, 2015
Allan Stokes
Director Environmental Programs
National Pork Board
Points to Consider...

• World population 9 -10 Billion by 2050

• To keep up with population growth global food production will need to increase 70% - 80% by 2050

• To keep up with population growth more food will have to be produced in the next 50 years as the past 10,000 years combined.
Points to Consider...

There are limitations to emissions reductions in the agriculture sector particularly because of the role of the sector in providing food for a global population that is expected to continue to grow in the coming decades. Therefore, it would be reasonable to expect emissions reductions in terms of improvements in efficiency rather than absolute reductions in GHG emissions.

Challenges and opportunities for mitigation in the agricultural sector
Policies & Measures – pages 7 & 8
Protecting the Environment

Safeguarding the environment comes naturally to America’s pork producers because we understand our inherent responsibility to future generations.
Protecting the Environment

• 153 Research projects ($7.5 Million) funded
Protecting the Environment

- National Air Emissions Monitoring Study (NAEMS)
  - Two-year study (2007-2009)
  - U.S. EPA designed, directed, and supervised
    - Pork, dairy, eggs & broilers
  - Conducted by Purdue University
  - Industry funded - $5 Million - Pork
  - 11 Monitoring sites in 4 states
    - North Carolina (4)
    - Indiana (2)
    - Iowa (2)
    - Oklahoma (3)
  - ALL data provided directly to U.S. EPA
Protecting the Environment

• Doing What’s Right - We Care℠
  – Produce Safe Food
  – Protect And Promote Animal Well-Being
  – Ensure Practices to Protect Public Health
  – Safeguard Natural Resources In All Of Their Practices
  – Provide A Work Environment That Is Safe
  – Contribute To A Better Quality Of Life In Their Communities
Protecting the Environment

• Addressing a Changing Marketplace
  – Consumers more removed from production agriculture
  – Consumers concerned about food quality, environment, animal welfare & health impacts associated with modern agriculture
  – Increased media coverage of food production issues & increased pressure from special interest groups
  – Agriculture & America’s pork producers need to maintain & enhance consumer trust
Protecting the Environment

• Benefits to Producers
  – Improved management efficiency
  – Reduced input costs
  – Potential new revenue sources from energy or byproducts
50 Years of Progress: 1959-2009

- Hogs marketed increased 29%
- Breeding herd decreased 39%
- Over 2X carcass wt. produced/sow/per
- Feed efficiency improved 33% / lb. carcass wt.
- Water use reduced 41%/lb. carcass wt.
- Total land use reduced 59%
  - 78%/lb. carcass wt.
- Carbon footprint reduced 35%/lb. carcass wt.
Four Pillars of Environmental Sustainability

- **Carbon Footprint 2011**
  - Greenhouse Gas
    - Methane, Nitrous Oxide, CO₂

- **Land Footprint 2014**
  - Land Use
    - Include Feed Crops

- **Environment Sustainability Program**

- **Water Footprint 2013**
  - Water Use

- **Air Footprint 2014**
  - Air Emissions
    - Dust, Ammonia, Hydrogen Sulfide

People. Pigs. Planet.
Four Pillars of Environmental Sustainability

• University of Arkansas Center for Agricultural and Rural Sustainability

• 3 Phase Approach
  – Literature Review
  – Scan Life-Cycle Assessment (LCA) - Pork Chain
    • Across entire pork chain - “field to fork”
    • Understand pig production relative contribution
  – Detailed Life-cycle Assessment – Pig Production
    • Focus on pig production - “field to farm gate”
    • Understand details of live pig production contribution
Four Pillars of Environmental Sustainability

• Goal
  – Pork Supply Chain Scan Level LCA
    • Based on 1 serving (4 oz.) boneless pork to U.S. consumer
  – Detailed Live Swine Production LCA
    • Based on 1 pound live weight sent to harvest

• Scope
  – Field to Finished Product
    • Include fuels
    • Exclude infrastructure (buildings/equipment/etc.)
Pork's Carbon Footprint

U.S. Greenhouse Gas Sources

- Swine: 0.35%
- Other Livestock: 2.77%
- Human Waste Systems: 2.46%
- All Other Sources: 94.42%

Pork’s Carbon Footprint

• 2.87 Lb. CO$_2$e / Lb. Live Wt. – At Farm Gate
  – 3.8 Lb. CO$_2$e / Lb. Dressed Carcass Wt. – At Farm Gate

• 2.48 Lb. CO$_2$e/4 oz. boneless serving-Field-to-Fork
  including Feed crop production
  – On-farm use
  – Transportation
  – Processing & packaging
  – Retail contributions
  – Consumer consumption and
  – Disposal of unused pork & packaging

National Life Cycle Carbon Footprint Study for Production of US Swine - May 2011  Thoma, Nutter, Ulrich, Maxwell, Frank & East – University of Arkansas Center for Agricultural and Rural Sustainability
Pork’s Carbon Footprint

Thoma, Nutter, Ulrich, Maxwell, Frank & East – University of Arkansas
Pork’s Water Footprint

- 18.38-18.94 Gal./Lb. Live Wt. – At Farm Gate
- 8.2 Gal./4 oz. boneless serving - Field-to-Fork including:
  - Feed crop production
  - On-farm use
  - Transportation
  - Processing & packaging
  - Retail contributions
  - Consumer consumption and
  - Disposal of unused pork & packaging
Field to Fork Water Footprint

- Swine Rations, 84%
- Retail, 1.50%
- Consumption, 0%
- Packaging, 0.70%
- Live Transport, 0.10%
- Processing, 0.30%

Per 4 oz. serving based on commodity feed

A Life Cycle Analysis of Water Use in U.S. Pork Production - Comprehensive Report – May 2014
Matlock, Thoma, Boles, Leh, Sandefur, Bautista & Ulrich – University of Arkansas Center for Agricultural and Rural Sustainability
Field to Farm Gate Water Footprint

[Diagram]

A Life Cycle Analysis of Water Use in U.S. Pork Production - Comprehensive Report – May 2014
Matlock, Thoma, Boles, Leh, Sandefur, Bautista & Ulrich – University of Arkansas Center for Agricultural and Rural Sustainability
On-farm Water Footprint

- Drinking: 87%
- Cooling: 6%
- Wash: 5%
- Other: 2%

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Pig Production Environmental Footprint Calculator  

Version 2.0

Pork producers must make decisions on their farms that involve multiple uses of energy sources, commodity intakes and animal production practices on a daily basis in order to produce high quality, nutritious pork at a reasonable cost. The purpose of this calculator is to enable the producer, planner or researcher to identify and quantify the sources of greenhouse gas (GHG) emissions and the consumption of water for a single pig barn and its associated manure system. It can also calculate the costs or savings associated with changing farm operations or hardware with regard to GHG emission and water usage.

There are several sources of GHG emissions both on and off the farm including fuel combustion, electricity production, manure management, feed production, water sourcing and many others. Water is used for animal drinking, barn cooling and washdown.

This calculator is a predictive model. That means the user does not have to know how much fuel, electricity, or feed was consumed and does not have to know the amount of manure produced, the model estimates all of this. The user enters the size and basic characteristics of the operation being modeled and the calculator returns the amount of GHGs emitted, water consumed, and the associated costs for each source.

This program developed at the University of Arkansas. Funding was from the National Pork Board and the U.S. Department of Agriculture.

Questions? Contact Us
Sustainable Pork Framework

America’s pork producers are taking public trust to the next level with their Pork Checkoff investment in research and efforts to develop an overall sustainable pork framework for pork producers.
Sustainable Pork Framework

1. Define “sustainability” in pig production
2. Define Key Performance Indicators (KPI)
3. Define impact metrics for each KPI
4. Benchmark performance for each metric
5. Develop and adopt goals for improvement across each metric
6. Implement improvement strategies
7. Measure each metric using best scientific methods at prescribed frequencies
8. Report results
9. Adjust and adapt practices as necessary
Sustainable Pork Advisory Council

- 28 Invitees
  - Restaurants
  - Food Service
  - Retail
  - Packer - Processors
  - Pork Producers

- Third-party Facilitation & Technical Support
  - Dr. Marty Matlock, University of Arkansas Center for Agricultural and Rural Sustainability

- Addressing Pig Production Only

- Provide Recommendations to National Pork Board Board of Directors
Narrative Definition

“Showing how We Care: Doing more to benefit people, pigs, and the environment (planet)”

Healthy pigs produce healthy pork for consumers. Our We Care℠ principles provide standards and training programs that help responsible farmers succeed by doing the right thing for people, pigs, and the environment. We invite you to join us in our commitment to the following values:

– Protecting public health through a commitment to farm and food safety;
– Protecting & promoting animal well-being with farmer-led standards and training programs;
– Safeguarding natural resources in all of our practices through our Four Pillars of Environmental Sustainability;
– Improving the work environment and best practices through continuous research and education; and
– Contributing to a better quality of life in our communities.
Key Performance Indicators (KPI’s)

• Human Health & Safety
• Animal Care & Welfare
• Environmental Stewardship
• Economic Integrity
## Key Performance Indicators (KPI) & Metrics

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<tr>
<th>Human Health &amp; Safety</th>
<th>Animal Care &amp; Welfare</th>
<th>Environmental Stewardship</th>
<th>Economic Integrity</th>
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<tr>
<td>Employee Relations</td>
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<td>Community &amp; Neighbor Relations</td>
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<td>Energy Use</td>
<td>Community Economic Benefit</td>
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<td>Employee Safety &amp; Health</td>
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<td>Product Integrity</td>
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<td>Water Quality</td>
<td>Value Chain Collaboration</td>
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Metrics Points Under Development

- SMART (specific, measureable, achievable, relevant, & time bound)
- Science-based & technology neutral
- Outcome-based & only practice-based if measurement of outcomes is impractical
- Non-prescriptive & flexible toward practices
- Cost implications & savings opportunities are considered
- Useful to producers and stakeholders
- Producers can benchmark and compare operations
KPI Metric Points - Human Health & Safety

- Days Away, Restricted or Transferred (DART)
- Worker Injury Incidence Rate
- Workers Compensation Costs
  - Per Employee &
  - Per Pig Raised
- Violative Residues In Market Hogs
  - Sow/boars & roaster pigs
- Medication & Treatment Records
  - Measuring producers who have medication & treatment records

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KPI Metric Points - Animal Welfare

• Caretaker Training
  – Caretakers able to articulate or demonstrate training specific to their daily duties
  – All caretakers PQA Plus Certified within 6 months of hire and maintain certification while employed
  – Caretakers responsible for euthanasia have documented training & familiar with site euthanasia plan

• Timely Euthanasia
  – Animals are euthanized in timely manner as defined in common audit standard

• Welfare Audit Scores
  – Total animal welfare score on common industry audit
KPI Metric Points - Environmental Stewardship

- **Carbon Footprint**
  - Lb. CO2e/Lb. live weight at farm gate
- **Water Use Footprint**
  - Gal./Lb. live weight at farm gate
- **Land Use Footprint**
  - Acre/Lb. live weight at farm gate
- **Energy Use**
  - Purchased on-farm barn electricity & gas use/Lb. live weight
KPI Metric Points - Economic Integrity

- Sow Lifetime Productivity
  - Pigs Per Productive Sow Lifetime
- Mortality Rate
  - Pre-weaning, nursery & grow finish
- Grow Finish Caloric Efficiency
  - Calories/Lb. of gain
- Assess Consumer Perceptions & Attitudes Toward Pork
  - Annual tracking study
- Increase Pork's U.S. Market Share vs Beef & Chicken
  - Increase Pork's Market Share of Real Per Capita Expenditures in U.S.
Sustainable Pork Framework

• Define “Sustainability”
• Define Key Performance Indicators (KPI)
• Define critical impact metrics for each KPI
• Benchmark performance for each metric
• Develop and adopt goals for improvement across each metric
• Measure each metric using best scientific methods at prescribed frequencies
• Implement improvement strategies
• Report results
• Adjust and adapt practices as necessary
Questions?