Commodity Pork Production Trends

- Erosion of the average profit per pig
- Increased awareness of economies of scale
- Payment based on lean percentage
- Comprehensive effort to lower cost of production
- This requires maximizing output from farm

Approaches to Maximizing Output

- Management
  - Early weaning production schedules
- Housing
  - Increased usage of inside crated gestation
- Genetics
  - Maximize reproduction (litter size)
  - Maximize leanness
- Result is the potential for animals to be less fit in terms of longevity and livability

Purpose of This Presentation

- Examine the phenotypic trends in sow longevity and sow mortality in commercial herds of swine over the past 10 years
- Problem:
  - Getting access to data that is comprehensive, accurate and available

Data Description and Limitations

- Data came from PigChamp® records of 42 cooperating commercial swine herds
- Herd size ranged from 110 sows to 2500 sows in annual average sow inventory
- Data analyzed were records of sows removed from the herds from 1992-2002
- Total data set size was 142,494 removed sows

Source of Genetics

- All herds in this data set used seedstock suppliers that were National Swine Registry members
- This then limits the inferences that can be drawn from the data
Data Extraction

- Data was extracted using the Database Applications subroutine, List Data option.
- Output variables included sow ID, removal date, removal parity, removal reason, genetics and farm ID.
- Sow longevity was defined as lifetime number of litters produced by a sow prior to her removal (Removal Parity).
  - Brisbane and Chesnais (1996)

Least Squares Means for Sow Removal Parity by Year

Changes in Average Herd Size and Sow Death Rates

Sow Removal Reasons

<table>
<thead>
<tr>
<th>Removal Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive problems</td>
<td>49.1%</td>
</tr>
<tr>
<td>Physical problems</td>
<td>14.3%</td>
</tr>
<tr>
<td>Age</td>
<td>8.6%</td>
</tr>
<tr>
<td>Milking problems</td>
<td>6.2%</td>
</tr>
<tr>
<td>Management decision</td>
<td>3.4%</td>
</tr>
<tr>
<td>Poor performance</td>
<td>1.7%</td>
</tr>
<tr>
<td>Others</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

Summary

- Based on a data set from commercial swine producers using NSR purebred genetics:
  - Sow longevity (defined as removal parity) did not appear to change over the past 10 years.
  - Sow mortality did appear to increase from 4% to 6% over the past 10 years.

Summary

- Reasons for sow removal were primarily reproductive problems such as failure to conceive or not cycling.
  - Physical problems such as unsoundness and lameness were the second leading reason for sow removal.
  - Poor performance was a minor reason for sow removal.
Genetic Effects on Sow Longevity

NPB Maternal Line Genetic Line Evaluation Program
- A genetic evaluation of six maternal lines
- Included all reproductive traits plus post weaning traits
- Two 1600 sow farms were populated with gilts from these six maternal lines
- Each line was represented by approximately 600 females
- Allowed to go through parity 4

Maternal Genetic Populations
- American Diamond Swine Genetics (LY)
- Danbred USA (LY)
- Monsanto Choice Genetics DK44 (LY)
- Monsanto Choice Genetics GPK347 (NLY)
- National Swine Registry (LY)
- Newsham Hybrids

Project Protocol
- Gilts from each maternal line were delivered to an SEW station at 10-20 days of age
  – this was done over two replicates
- After 60 days, they were taken to a finishing facility
- At 165 days of age they were placed in one of the two new 1600 sow breeding gestation units

Project Protocol
- Only gilts that died, were injured, had an abnormality (hernia, etc) were rejected.
- No gilts were culled for poor growth or backfat
- 3283 gilts entered the sow facilities and were checked for estrus daily and bred on second or later heat period (minimum age 210 days)
- All matings were done using AI

Project Protocol
- After 300 days of age, if gilt not mated she was slaughtered
- After weaning, sows were given 50 days to rebreed.
- No sow was culled for poor performance or structure
- Average weaning age was 15.4 days
Sow Fallout Rates by Age of Breeding Female

<table>
<thead>
<tr>
<th>Age of Breeding Female</th>
<th>Producing Through Fourth Parity</th>
</tr>
</thead>
<tbody>
<tr>
<td>150-330 days</td>
<td>18%</td>
</tr>
<tr>
<td>331-450 days</td>
<td>12%</td>
</tr>
<tr>
<td>451-570 days</td>
<td>8%</td>
</tr>
<tr>
<td>571-690 days</td>
<td>6%</td>
</tr>
<tr>
<td>691-810 days</td>
<td>5%</td>
</tr>
<tr>
<td>811-1000 days</td>
<td>6%</td>
</tr>
<tr>
<td>101-2000 days</td>
<td>5%</td>
</tr>
<tr>
<td>Average</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

Cohort Analysis

• “Cohort Group” is a group of 25 females either purchased or entered into the herd
  – this is a group of animals that share a common environment within a defined period of time
• What do you get from a purchase of 25 SEW gilts?

Genetic Effects on Sow Longevity and Performance

• There are significant difference between maternal genetic lines in sow fallout rate, sow longevity, litter production and litter size
• This significance was the GPK347 (NIL cross) being better than all others
• The pigs from these NIL cross females were significantly poorer in post-weaning performance