Trends in Sow Longevity and Mortality in the U.S. Industry

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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(R) 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

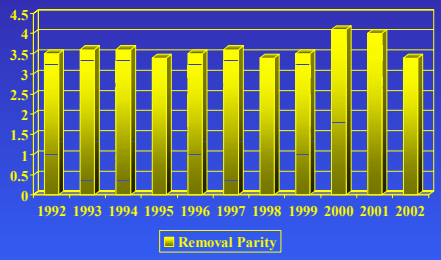
Source of Genetics

- 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

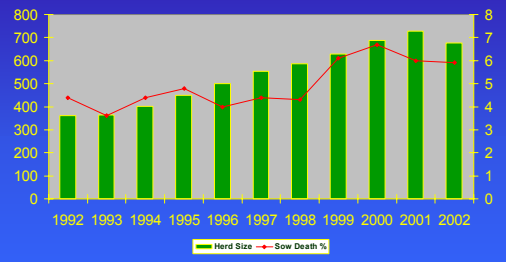
Data Extraction

- 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

Removal Reason	Percentage
Reproductive problems	49.1%
Physical problems	14.3%
Age	8.6%
Milking problems	6.2%
Management decision	3.4%
Poor performance	1.7%
Others	16.7%

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

150-330 days	331-450 days	451-570 days	571-690 days	691-810 days	Producing Through Fourth Parity	Genetic Line
18%	**12%**	**8%**	**6%**	**5%**	**50.6%**	Average 5 Lines
6%	**9%**	**5%**	**6%**	**5%**	**70%**	GPK 347

Percent of Entered Females Still in Production

Genetic Line	P-1	P-2	P-3	P-4	P-5	P-6
Amer. Diamond	77	64	57	50	40	30
Danbred	77	63	56	48	39	26
DK-44	75	65	57	50	39	32
GPK-347	92	83	77	70	63	51
NSR	76	63	57	52	43	32
Newsham	78	65	59	52	43	30

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?

Production From 25 Female Cohort

Genetic Line	Litters	Pigs
Amer. Diamond	79.7	758
Danbred	76.9	767
DK-44	80.5	843
GPK-347	109.0	1172
NSR	80.6	790
Newsham	81.4	790

NIL Performance vs (Other herdmates)

Trait	Herd 1	Herd 2	Herd 3
P0 fallout rate	7% (13%)	16% (26%)	25% (32%)
P1 FR	77%(70%)	88% (77%)	91% (86%)
NBA	10.3 (9.8)	11.8 (10.4)	11.1 (9.9)
Mort%	9% (8%)	12% (12%)	13% (14%)
W2E	6.9 (9.2)	6.0 (7.4)	5.4 (8.1)
P2 FR	80%(70%)	100%(84%)	
NBA	10.5 (9.7)	11.0 (10.3)	
Mort%	8% (7%)	12% (10%)	
W2E	6.0 (7.4)	5.0 (6.0)	
P3 FR	84%(76%)		
NBA	12.4 (9.9)		
Mort%	10% (7%)		
W2E	6.7 (7.5)		
Death Rate	2% (8%)	2% (8%)	2% (6%)
NPSD	40 (54)	54 (85)	54 (88)
Pigs wn/sow/year	24.7 (20.9)	26.1 (22.6)	25.1 (21.5)

(minimum 10 sows mated per parity)

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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