SowBridge
Breeding Herd Education Series
2010
*Timely, relevant & convenient learning*

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# Geriatric Sows: Keep or Cull

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## Parity profile of sow herd

- **Influences**
  - Performance
    1. Productivity (NB, NBA, weaning wts, etc.)
    2. Biological performance (immune status, colostrum quality, etc.)
  - Economic performance
  - Worker morale



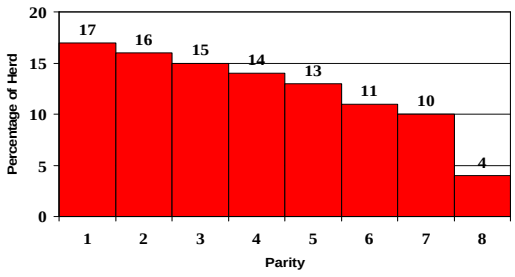
## Importance of parity profile

- **Optimum parity**
  - Mathematical function
    1. Sow removal rate
    2. Gilt availability
    3. Market price (sow and market hog price)
    4. Feed costs
- **Removal rate**
  - Sum culling rate and mortality rate



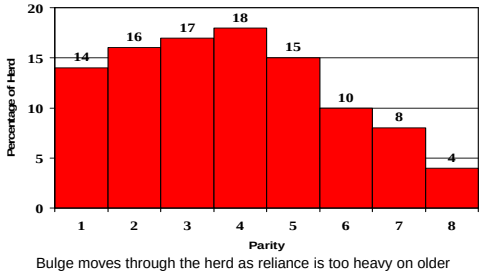
## Ideal Shape of Herd Parity Profile,

(Carroll, 1999)






## Too Much Reliance on Older Sows




Bulge moves through the herd as reliance is too heavy on older sows and herd does not replace enough gilts. Productivity remains good.

## Types of culls

- **Voluntary – producer has some say or choice in which animals are culled**
- **Involuntary – producer really has no choice when to cull animal**
  - Long wean-to-estrus
  - No estrus
  - Lameness

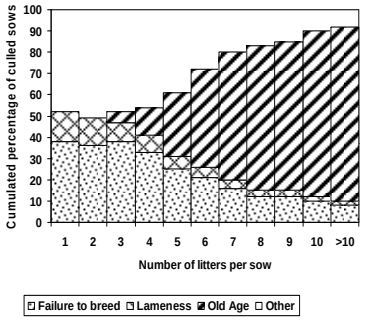


## Reasons For Culling

| Reason | Percentage Culled |
|---|---|
| Reproductive failure | 30 - 35 |
| Old age | 15 - 20 |
| Performance | 15 - 20 |
| Feet and leg problems | 10 - 15 |
| Death | 5 - 10 |
| Post-farrowing problems | 3 - 5 |
| Other | 5 - 10 |



**Incidence of failure to breed, lameness and culling for old age, in the sows according to litter parity** *Dagorn & Aumaitre, 1978*






## Target Levels

- What should replacement rates be?
  - Can certainly do better than currently
  - Can we achieve 35 to 40 percent replacement rate?
- Herd life average 4.5 to 4.8 parities
- Longer introduction periods
  - Increase their cost up to 15%
  - Payback far outweighs time, trouble, and money invested early on into the gilt and that first parity sow



## Are current replacement rates too high?

- We cull so many sows prematurely
  - Due to reproductive failure
  - Occurs at the end of the 1st, 2nd, and 3rd parity
  - Young sows produce fewer antibodies to protect young
  - Gilts entering herds too young often do NOT become exposed to normal herd pathogens



**Sow replacement-rate, related to the number of litters produced per sow**

| | Litters per sow per year | |
|---|---|---|
| **Average Number of Litters / Sow** | **2.1** | **2.35** |
| 3 | 70 | 78 |
| 4 | 52 | 59 |
| 5 | 42 | 47 |
| 6 | 35 | 39 |
| 7 | 30 | 34 |
| 8 | 26 | 29 |
| 9 | 24 | 27 |
| 10 | 21 | 24 |

## Do we need to make culling decisions based on the need to keep up with genetic progress from gilt supplier?



## Culling to maintain genetic performance

- **Assumptions**

| | Genetic Improvement Per Generation Interval | Economic Value |
|---|---|---|
| Number Born Alive: | 0.3 | $22.00 |
| 21 Day Litter Weight: | 3 | $0.70 |
| Days to Market: | 3 | $0.17 |
| Backfat: | 0 | $15.00 |
| **Generation Interval (years):** | 1.5 | |

**Culling Rate:** 0.188 (133)
**Retention Rate:** 0.811 (867)



## Culling to maintain genetic performance

| Parity of Sow | Generation Age of Sows | Economic Loss per Parity | Parity of Forced Culling 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.6667 | $8.77 | 100 | 55 | 40 | 33 | 29 | 26 | 25 | 23 | 22 | 21 | 21 | 20 | 20 | 20 | 20 |
| 2 | 0.9630 | $15.96 | | 45 | 33 | 27 | 24 | 21 | 20 | 19 | 18 | 17 | 17 | 17 | 16 | 16 | 16 |
| 3 | 1.2593 | $24.80 | | | 27 | 22 | 19 | 17 | 16 | 15 | 15 | 14 | 14 | 14 | 13 | 13 | 13 |
| 4 | 1.5556 | $35.11 | | | | 18 | 16 | 14 | 13 | 12 | 12 | 11 | 11 | 11 | 11 | 11 | 11 |
| 5 | 1.8519 | $46.89 | | | | | 13 | 11 | 11 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 |
| 6 | 2.1481 | $59.77 | | | | | | 9 | 9 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 |
| 7 | 2.4444 | $73.97 | | | | | | | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 8 | 2.7407 | $89.46 | | | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 9 | 3.0370 | $106.07 | | | | | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 10 | 3.3333 | $124.06 | | | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 |
| 11 | 3.6296 | $143.41 | | | | | | | | | | | 3 | 3 | 3 | 2 | 2 |
| 12 | 3.9259 | $164.13 | | | | | | | | | | | | 2 | 2 | 2 | 2 |
| 13 | 4.2222 | $186.23 | | | | | | | | | | | | | 2 | 2 | 2 |
| 14 | 4.5185 | $209.69 | | | | | | | | | | | | | | 1 | 1 |
| 15 | 4.8148 | $234.52 | | | | | | | | | | | | | | | 1 |
| | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Average Loss per sow in the herd | | | $8.77 | $11.99 | $15.41 | $18.91 | $22.45 | $25.92 | $29.29 | $32.53 | $35.62 | $38.53 | $41.26 | $43.80 | $46.16 | $48.32 | $50.30 |



## Culling to maintain genetic performance

Number born alive by parity

| Parity | NBA | Pre-wean Mort | Post wean Mort | Pigs Weaned | Pigs Sold |
|---|---|---|---|---|---|
| 1 | 10.2 | 10 | 5 | 9.18 | 8.721 |
| 2 | 11 | 10 | 5 | 9.9 | 9.405 |
| 3 | 11.4 | 10 | 5 | 10.26 | 9.747 |
| 4 | 11.4 | 10 | 5 | 10.26 | 9.747 |
| 5 | 11.4 | 10 | 5 | 10.26 | 9.747 |
| 6 | 11 | 10 | 5 | 9.9 | 9.405 |
| 7 | 10.9 | 10 | 5 | 9.81 | 9.320 |
| 8 | 10.8 | 10 | 5 | 9.72 | 9.234 |
| 9 | 10.6 | 10 | 5 | 9.54 | 9.063 |
| 10 | 10.6 | 10 | 5 | 9.54 | 9.063 |
| 11 | 10.6 | 10 | 5 | 9.54 | 9.063 |
| 12 | 10.6 | 10 | 5 | 9.54 | 9.063 |
| 13 | 10.6 | 10 | 5 | 9.54 | 9.063 |
| 14 | 10.6 | 10 | 5 | 9.54 | 9.063 |
| 15 | 10.6 | 10 | 5 | 9.54 | 9.063 |



## Importance of accurate records when making culling decisions

- All too frequently, decisions to modify a sow system or a grow-finish population are based on field-collected data and can lead to incorrect management decisions.
- Accuracy of farm data is essential when it is used by producers to make business and management decisions.
- Farm data also allows researchers to quantify the economic importance of culling factors and other key production indicators.



## Breeding Herd Study Results:

**Of the sows evaluated, 209/923 (23%) were found to have an inaccurate culling code.**

| Cull code | Frequency | % | Frequency of an improper culling code[b] | % |
|---|---|---|---|---|
| Old age | 322 | 35 | 62 | 19 |
| Did not conceive | 172 | 19 | 48 | 28 |
| Anestrous | 123 | 13 | 7 | 6 |
| Body condition | 90 | 10 | 31 | 34 |
| Lameness | 83 | 9 | 0 | 0 |
| Farrowing productivity | 73 | 8 | 23 | 32 |
| Not found | 18 | 2 | 18 | 100 |
| Cesarean section | 15 | 2 | 14 | 93 |
| Prolapse | 11 | 1 | 0 | 0 |
| Other illness | 8 | 1 | 0 | 0 |
| Unknown | 5 | 1 | 5 | 100 |
| Management | 2 | 0 | 0 | 0 |
| Sudden death | 1 | 0 | 1 | 100 |
| Total | 923 | 100 | 209 | 23 |

## Breeding Herd Study - Conclusions

- **Concern over the accuracy of farm records for culling is raised from the magnitude of errors observed in the present study.**



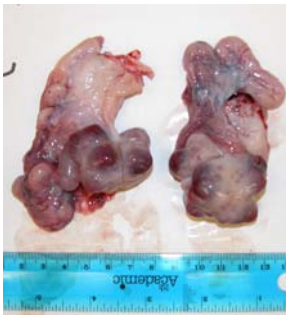
## Foot lesions %

| # of lesions | Front | Rear | Combined Front/Rear |
|---|---|---|---|
| 0 | 48.5 | 19.5 | 13.6 |
| 1 | 43.8 | 51.3 | 29.5 |
| 2 | 7.3 | 23.8 | 33.3 |
| 3+ | .4 | 5.5 | 23.6 |



## Reproductive

- **Ovaries**
  - normal 85%
  - Cystic 6%
  - Acyclic 9%
- **Pregnant 6%**





## Characterization of U.S. Midwestern cull sows

**Results- heel lesions- hind 67.5%, front 32.9%**



## Why is it so popular to cull at the 6th parity?

- Large herds operate on a proforma basis
  - Replacements are ordered up well in advance or prepared in gilt pools for automatic entry
  - Done at a convenient parity
  - Done when it fits pig flow
- Naturally acquired immunity tends to fall off in sows at this age in general
  - Can threaten younger animals
  - Viral diseases often peak again at this time
- Exercise restricting conditions for sows in large herds tend to cause culling from leg and physical problems by parity 6
  - Even as sows are otherwise healthy and productive enough
- Breeding companies encourage rapid turnover to maximize genetic improvement in the commercial operations



## Parity distribution given maximum parity and culling rate

| | |
|---|---|
| Culling Rate | 0.15 |
| | 0.85 |
| Avg. Parity of sows that farrowed | 3.5 |
| Average No. Born Alive | 10.2 |
| No. of Sows farrowed per group | 100 |

## Parity distribution given maximum parity and culling rate

| Parity | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 100 | 54.1 | 38.9 | 31.4 | 27.0 | 24.1 | 22.1 | 20.6 | 19.5 | 18.7 | 18.0 | 17.5 | 17.1 |
| 2 | | 45.9 | 33.0 | 26.7 | 22.9 | 20.5 | 18.8 | 17.5 | 16.6 | 15.9 | 15.3 | 14.9 | 14.5 |
| 3 | | | 28.1 | 22.7 | 19.5 | 17.4 | 16.0 | 14.9 | 14.1 | 13.5 | 13.0 | 12.6 | 12.3 |
| 4 | | | | 19.3 | 16.6 | 14.8 | 13.6 | 12.7 | 12.0 | 11.5 | 11.1 | 10.7 | 10.5 |
| 5 | | | | | 14.1 | 12.6 | 11.5 | 10.8 | 10.2 | 9.7 | 9.4 | 9.1 | 8.9 |
| 6 | | | | | | 10.7 | 9.8 | 9.1 | 8.7 | 8.3 | 8.0 | 7.8 | 7.6 |
| 7 | | | | | | | 8.3 | 7.8 | 7.4 | 7.0 | 6.8 | 6.6 | 6.4 |
| 8 | | | | | | | | 6.6 | 6.3 | 6.0 | 5.8 | 5.6 | 5.5 |
| 9 | | | | | | | | | 5.3 | 5.1 | 4.9 | 4.8 | 4.6 |
| 10 | | | | | | | | | | 4.3 | 4.2 | 4.1 | 4.0 |
| 11 | | | | | | | | | | | 3.5 | 3.4 | 3.4 |
| 12 | | | | | | | | | | | | 2.9 | 2.9 |
| 13 | | | | | | | | | | | | | 2.4 |
| | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Pigs Produced | | 11.09 | 11.35 | 11.47 | 11.55 | 11.55 | 11.53 | 11.50 | 11.47 | 11.45 | 11.43 | 11.42 | 11.41 |
| Pigs Produced per Group | 1100 | 1109 | 1135 | 1147 | 1155 | 1155 | 1153 | 1150 | 1147 | 1145 | 1143 | 1142 | 1141 |
| Avg Parity | | 1.45 | 1.89 | 2.29 | 2.67 | 3.03 | 3.36 | 3.67 | 3.95 | 4.21 | 4.46 | 4.67 | 4.87 |
| Culling Rate/ parity | | | 0.15 | | | | | | | | | | |

| Avg. Parity of sows that farrowed | 3.5 | Average No. Born Alive | 10.2 | No. of Sows farrowed per group | 100 |
|---|---|---|---|---|---|



## Effective sow culling begins with effective culling / selection of replacements gilts.

- **If grow-finish daily gain is in the lower 25th percentile of contemporary group.**
  - Would prefer that gilts are in the top 50-60% for growth in their contemporary group.
  - Consider taking top 75 % of gilts for growth rate.
  - After culling for other criteria (underline, feet and legs, etc.), if the number of replacements available exceeds those needed, additional culling for growth rate is possible.



## Effective sow culling begins with effective culling / selection of replacements gilts.

- **Cull all gilts with extremely small or infantile vulvas.**
- **Cull all gilts with a vulva that is tipped up excessively.**
  - Reproductive and urinary tract infections
- **Cull gilts having fewer than 6 functional well-spaced, properly positioned teats.**
  - 7 or even 8 functioning teats per side is desirable).
  - Poor spacing (maybe difficult for two piglets to nurse adjoining teats at the same time) or position is not correct (may not be accessible when sow lies down to nurse)



## Effective sow culling begins with effective culling / selection of replacements gilts.

- **Cull gilts that are obviously lame.**
  - Increased lameness incidence later in life
- **Cull animals that have injuries or illnesses**
  - May inhibit mothering ability
  - Result in less robust animal
- **Cull gilts that have a toe size difference greater than ½ inch.**
  - Typically occurs on the rear feet
  - Inside toe is smaller than the other
  - Contributes to heel lesions, cracked hooves, etc.



## Effective sow culling begins with effective culling / selection of replacements gilts.

- **Cull gilts that have buck kneed front legs.**
- **Cull gilts that have straight rear pasterns and are post legged.**
  - Appear high topped and have a steep rump.
- **Cull gilts that are extremely sickle hocked.**
- **Cull gilts that are narrow based and light muscled.**
- **Cull gilts that are excessively muscled so much so that normal movement is impaired which typically causes "goose stepping" rear legs.**



## Effective sow culling begins with effective culling / selection of replacements gilts.

- **Cull gilts that have "swaying" hind quarters.**
  - Seen in really long bodied gilts.
  - These animals can often cross their rear feet when walking.
- **Cull gilts that fail to cycle normally and after hormone treatment.**
  - Note gilts that were treated with hormones so they can be followed as sow for breeding problems.

## Culling recommendations

- **Once the decision to cull has been made, the sow should be immediately removed from the herd, and replaced as soon as possible by a served-gilt. Holding on to a sow to try to restore condition prior to sale is not economically justifiable as sows have an FCE of about 7:1.**
- **Following the above guidelines should ensure that a stable and productive parity profile is maintained on the unit, thus maximizing herd output, and therefore, profitability.**



## Sow culling recommendations

- **Cull sow if she is ill (unhealthy) or lame with little prospects of getting better with treatment.**
  - Choice between treating or culling immediately without treatment.
  - Concerned with withdraw times
  - How often do they respond to treatment
- **Cull sow that has had two consecutive low number of total born after the first parity.**
  - Sow cannot be culled for low number of piglets born until the 3rd parity at the earliest.



## Sow culling recommendations

- **Found open after attempting to breed the sow two consecutive estrus cycles.**
- **Cull sow based on parity only after the 10th parity (keep a watchful eye on parity distribution).**
- **Cull sow if there are more than 3 negative comments on the sow card**
  - (i.e. crushes allot of pigs, difficult to get into the crate, is aggressive with employees when moving. Etc.)



## Sow culling recommendations

- **Cull sow if she savages her young.**
  - If problem occurs at farrowing, remove pigs until she has completed farrowing.
  - If she continues to eat her young, cross-foster her piglets to other sows and cull her.
- **Cull sows failing to come in to estrus following hormone treatment. (i.e. 7 days post treatment and/or 18th day from weaning).**
- **Cull sow after the sixth parity if the total number born is below average and below the gilt average.**



## Sow culling recommendations

- **If sow has had two consecutive litters where 25% or more of the litter have a birth weight of 2 lbs. or less.**
- **Cull sow after sixth parity if over 50 percent of the piglets were still born.**

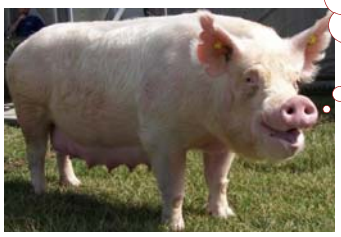


## Suggest culling thresholds based on the sow's history of pigs raised per litter.

| Parity | Cumulative pigs raised | Pigs raised in Previous 3 litters | |
|---|---|---|---|
| 2 | 19 | | |
| 3 | 30 | | |
| 4 | 40 | | |
| 5 | 50 | | |
| 6 | 60 | under 30 | The 30 value was established as a base by |
| 7 | 70 | under 30 | the total of the first 3 litters of production |
| 8 | 79 | under 30 | (gilt litter + parity 2 + parity 3 = 30) |

Thus, this number can be adjusted based on the numbers from your herd

## Thank You for Your Time and Attention

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