

# Factors involved in sow mortality

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# Multi-factorial issue

- Historical perspective from the ‘90s
- Improvement in early 2000s
- Industry expansion in 2014 – 2019
  - Movement to group housing
  - Increased sow prolificacy
  - Overall herd health post PEDv of 2013 – 2014
  - Labor shortage, experienced & inexperienced
- Acknowledgement of increasing sow prolapses
- Increasing welfare awareness

# Historical Perspective

We've been here before

# Historical sow mortality

- PigCHAMP® and PigTales® databanks show a trend of increasing sow mortality from 1993 to 1998
- To address this industry wide concern, PIC assembled a team of experts to objectively evaluate causes of sow mortality from both an epidemiologic and diagnostic perspective.
- 3.6 million parity records (1996-1998) were analyzed and 272 sows were systematically necropsied.
- The necropsy data was collected from 8 ( $>10,000$  sows) systems with sow mortalities  $\geq 12\%$ .
- Postmortems took place between December 1998 and June 1999.

# **Sow Mortality – Description and Conclusions**

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<sup>1</sup>PIC, Franklin, KY, <sup>2</sup>Abilene Animal Hospital, P.A., Abilene, KS;

<sup>3</sup>University of Minnesota

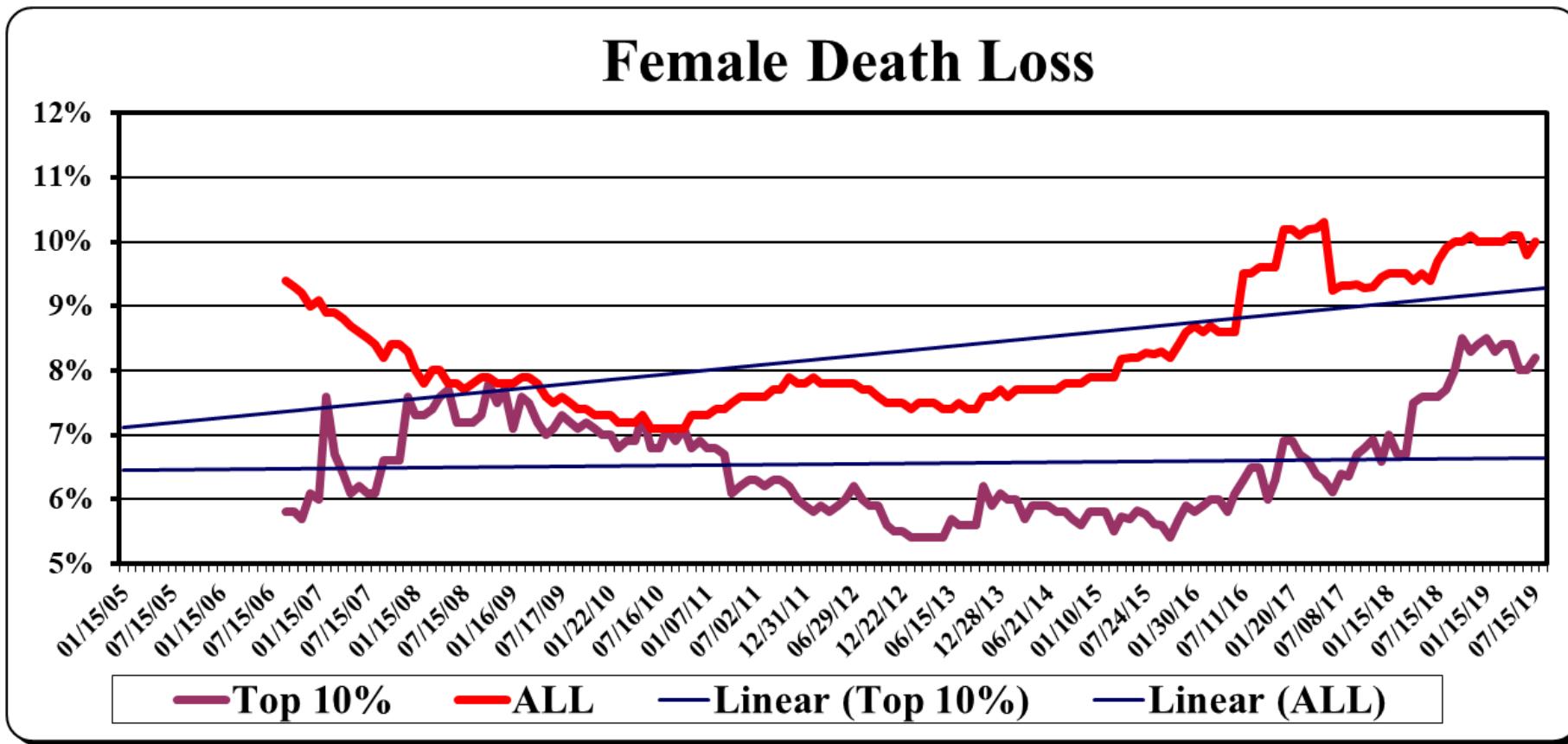
# Necropsy results

- Sow mortality is influenced by many factors.
- Locomotor problems were the primary cause of death/euthanasia, followed by gastrointestinal and then reproductive complications.
- Severe ulcers were identified in over 45% of the animals. The range between systems was 16-79%.
- There was no common underlying cause of death.

# Historical perspective

- Employee turnover, the shift toward larger farms and systems has contributed to the increased mortality problem.
- Gilt development and acclimatization influence sow mortality.
- Inappropriate selection rates, young parity retention, culling protocols and strict breeding targets.
- The sow herself is significantly different than ten years ago (C15 & C22 transitioning to Camborough).
- The sow is now a performance animal.

# 14.5 Year Trend line In the SMS Data Set



1.6 million sows on 900+ farms in North America

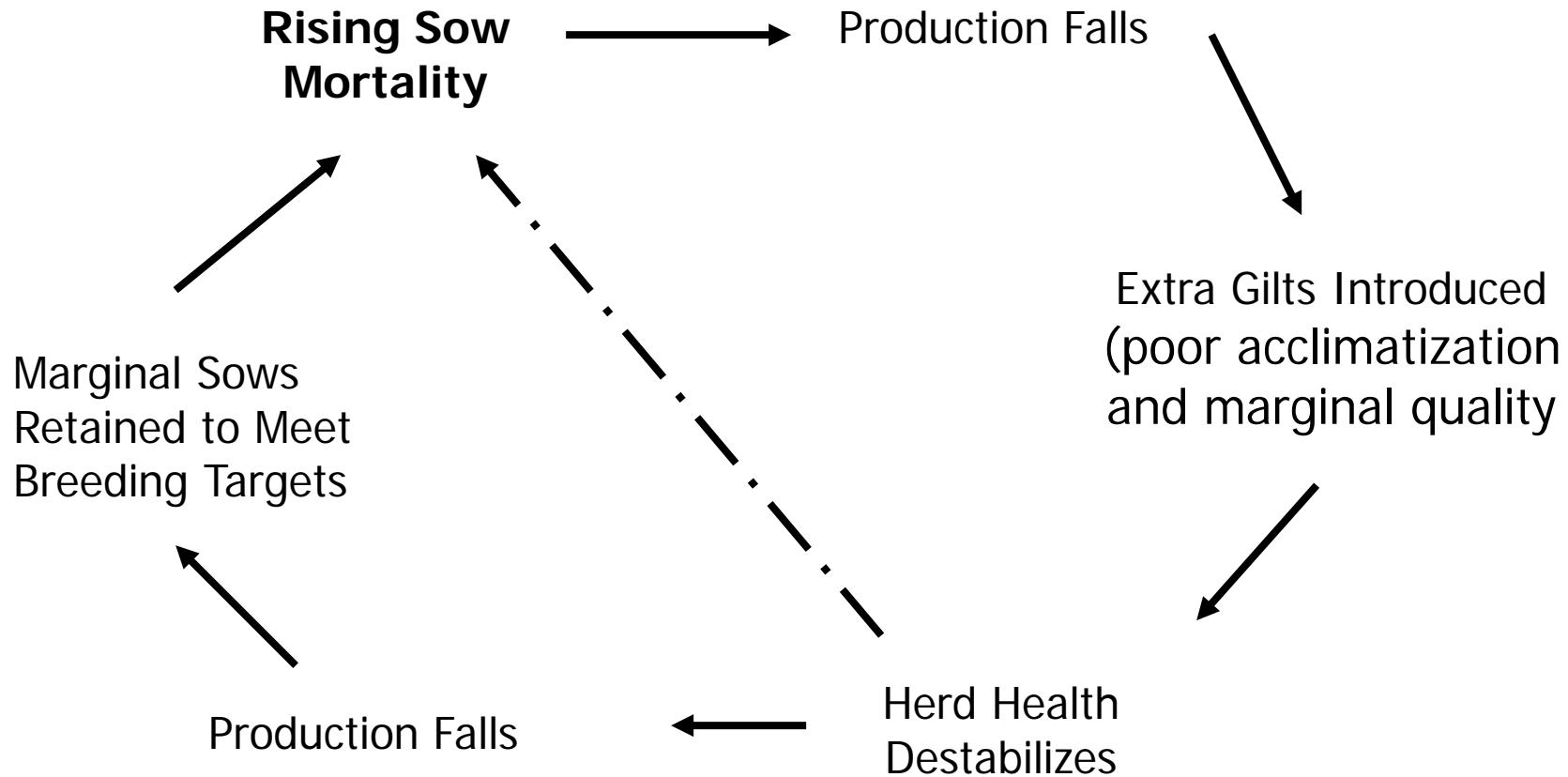
# PigCHAMP Data

Sow mortality	Median	Upper 10%	Lower 10%
US 2018 – 375*	11.8%	16.2%	7.2%
CA 2018 – 37*	10.5%	13.7%	3.2%

\* Number of Farms

Sow mortality	Median	Upper 10%	Lower 10%
US 2nd Q '19 – 369*	11.1%	17.5%	6.4%
US 3rd Q '19 – 343*	12.6%	19.1%	7.2%
CA 2nd Q '19 – 33*	8.7%	12.4%	1.3%
CA 3rd Q '19 – 35*	9.3%	17.9%	4.2%

# A Cycle of Increasing Sow Mortality



## **11,000 sow farrow to wean site**



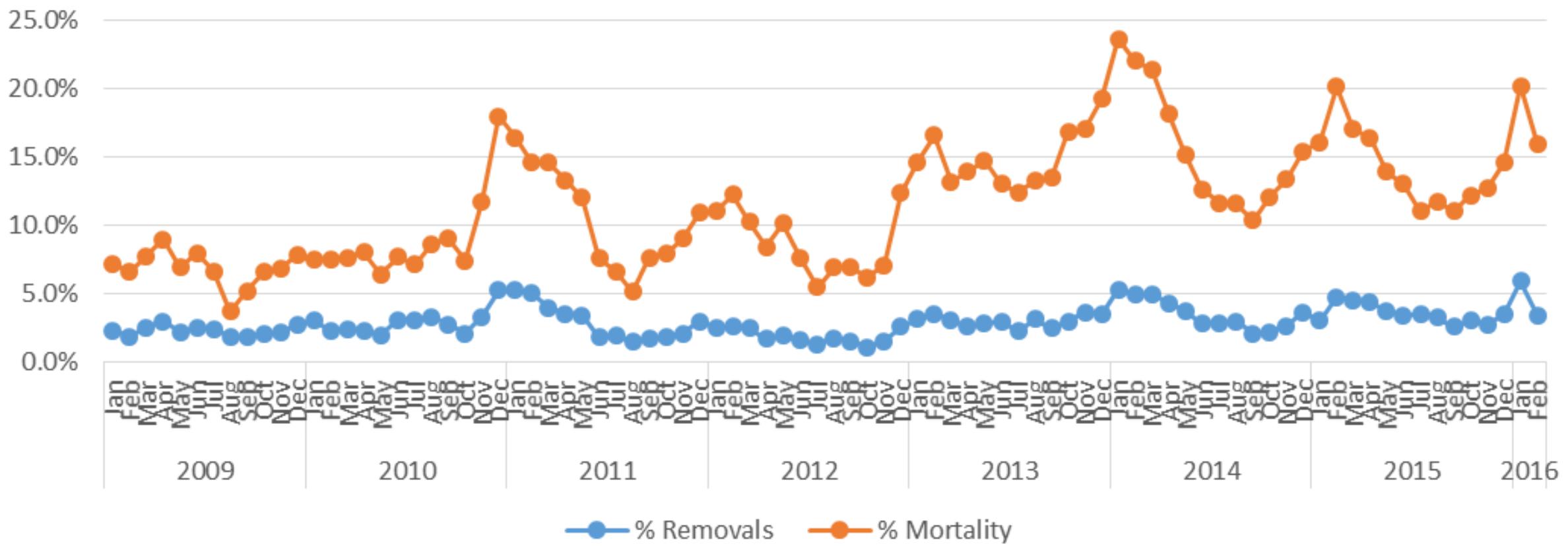
# Increasing current sow mortality

- Little research on this topic until recently
- Prolapses an increasing concern
- Producers transitioning to group housing
  - Retro-fit gestation a bigger challenge depending on age at gilt entry
  - ESF systems – numbers of sows per station
  - Static or dynamic groups
- Increasing welfare awareness
- Immigration policy changes – labor shortages
- Increasing total born trend on prolific sows

# Pelvic organ prolapse (POP)

- Sow prolapse working group formed AASV 2015
- Focus on uterine prolapses only
- Group had a wide array of experiences and roles
  - Production
  - Diagnostic medicine
  - Nutrition
  - Physiological research
- Created survey & submission forms to ISU VDL

## Sow Prolapses - North Region



Provided by Dr. Jeremy Pittman, Smithfield- North Division

# Sow Prolapse Working Group

- Objectives
  - Describe the variation in prevalence of uterine prolapses in sow herds
  - Identify the cause(s) and/or risk factor(s) of periparturient sow uterine prolapses

# Sow Prolapse Project Overview

- The Sow Farm Survey and Sow Prolapse Submission Form are used to examine areas of management that could be contributing to this problem as well as evaluating the following potential risk factors:
- 1) Hypocalcemia
- 2) Calcium/phosphorus imbalance in serum, urine, and feed
- 3) Phytase in feed
- 4) Mycotoxins in feed
- 5) Omega-3 fatty acids
- 6) Epinephrine in serum
- 7) Relaxin in serum

# Downfalls of this Project

- Veterinarians not on farm for every prolapse
- Incomplete sample submissions
- Large affected population and small sample size
- Lack of project funding

# An industry-wide approach to better understand the putative causes of pelvic organ prolapse in sows

Amanda Chipman, Chris Rademacher, Colin Johnson, Ken Stalder, Anna Johnson, Aileen Keating, John Patience, Nick Gabler, Daniel Linhares, Kent Schwartz, Suzanne Millman, Zoe Kiefer, Stephan Schmitz-Esser, Gustavo Silva, Jason W. Ross



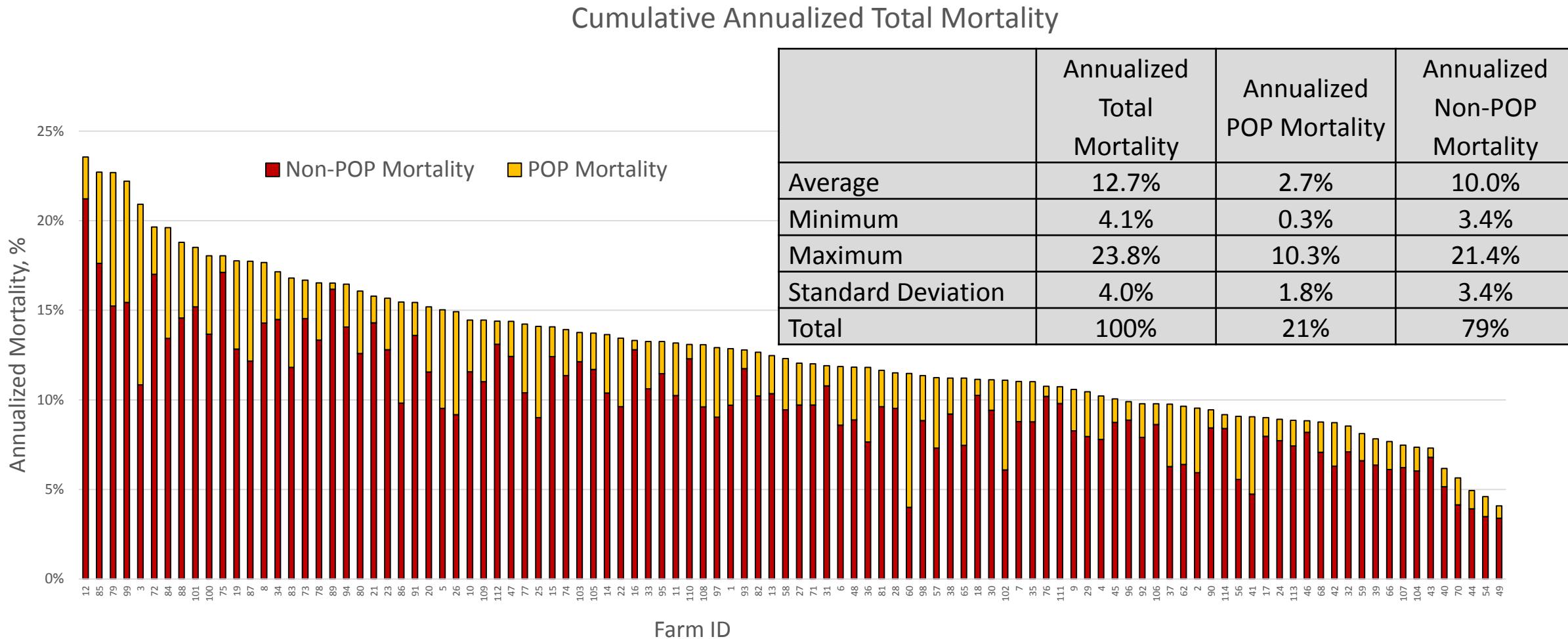
# Identification of putative factors contributing to pelvic organ prolapse (POP)

- National Pork Board funded this project NPB#17-224
- It was a controlled prospective study, Dr. Jason Ross lead
- 104 farms across the USA, 385,000 sows
- Survey based project that included 15 states
- Comprehensive survey conducted on all farms, 62 of them had visits from IPIC staff to collect individual sow data
- Each week all farms reported mortality grouped by POP or non-POP
- Annualized average POP rate – 2.7% of the total inventory

# POP study results of 52 week period

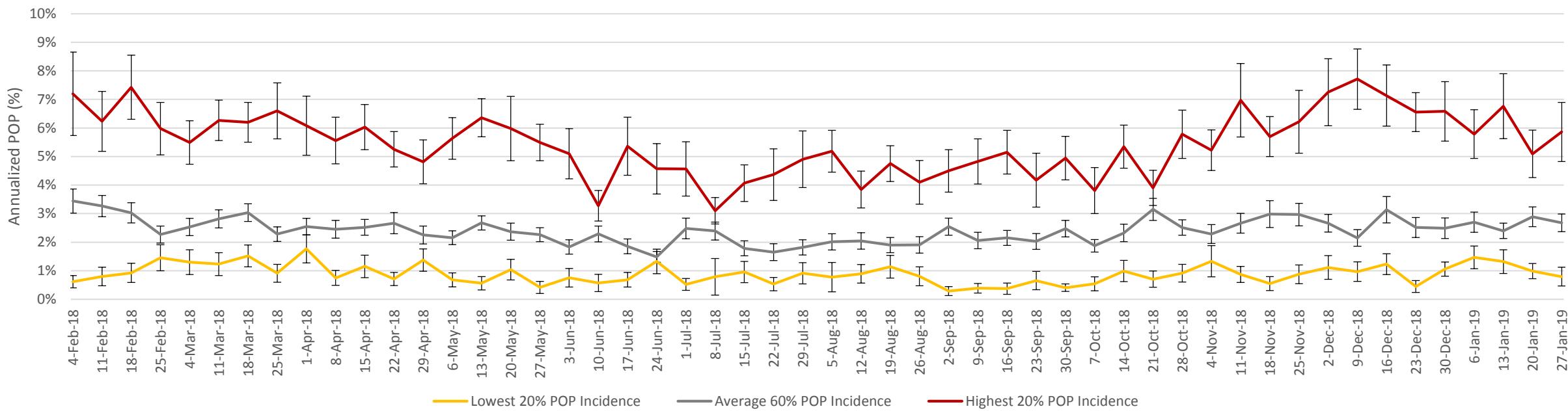
- POP was 21% of all mortality reported
- Sow farms with higher rates of POP had more variation, 0.3% - 10.3%
- Factors **not** associated with POP
  - Herd size
  - Farrowing induction
  - Assisted farrowings
  - Tail length
  - Water delivery type in gestation

# Average Mortality for 104 farms



# Significant Variation Across Farms Exists

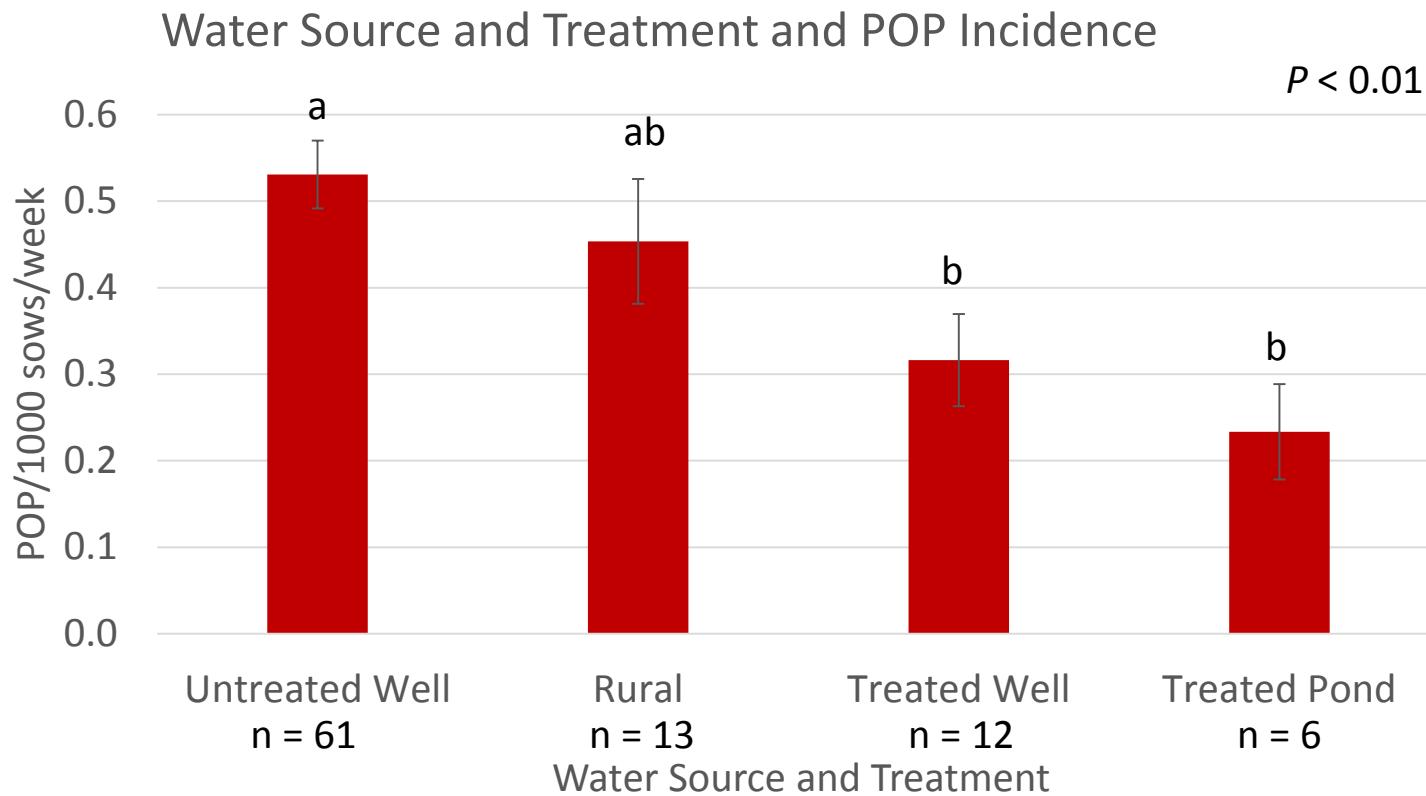
Annualized POP Mortality



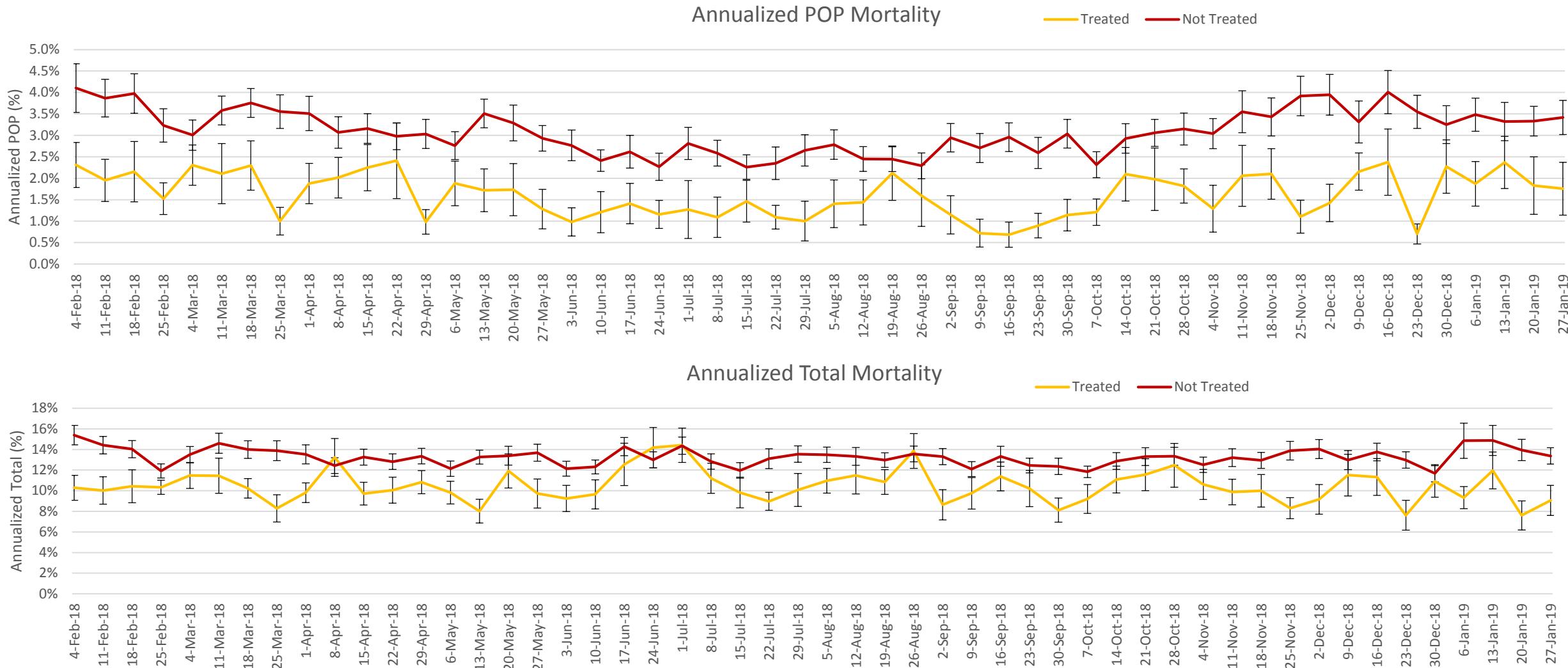
# Factors associated with POP

- Thin body condition in late gestation
- Feed amount in farrowing crates pre-farrow, < 5lbs. – P <0.01
- Untreated water source, pond or well
- Treated water source
  - Treatment with chlorine-based or Hydrogen peroxide, P = <0.01
  - Rural water not significant for POP but was for overall mortality

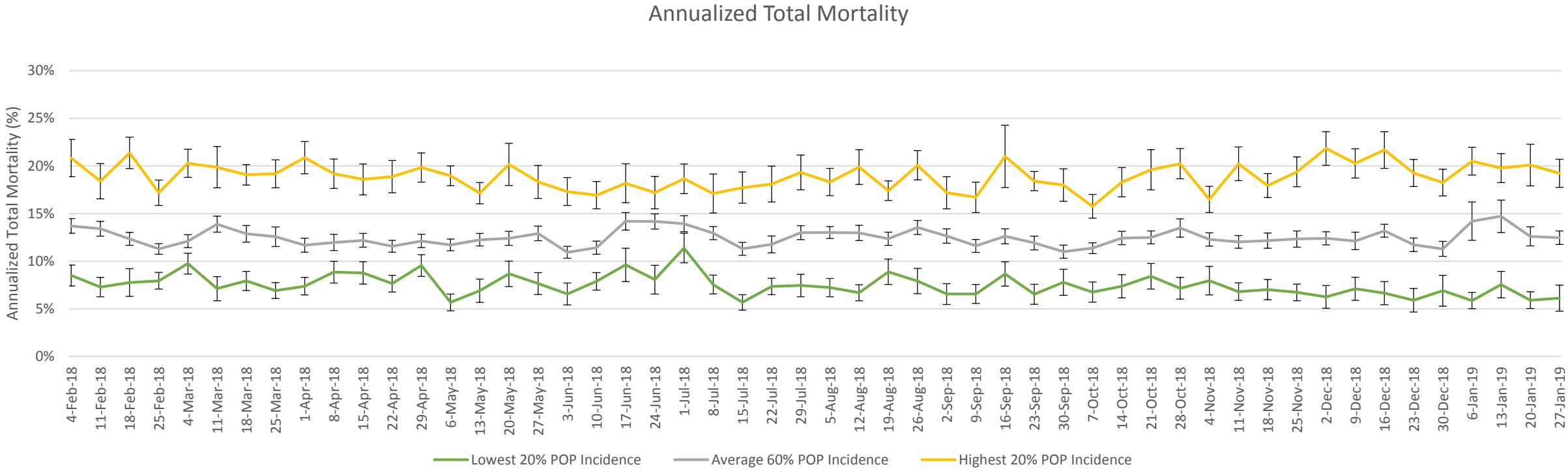
# Water Source and Treatment



# Weekly Effect of Water Treatment



# Significant Variation Across Farms Exists



# Perineal Scoring: Score 1

A scoring system of the perineal region to identify sows with potential risk for POP



Score 1: Presumed "Little to no" risk of uterine prolapse

Has none of the following: protrusion, vulva swelling, and swelling of perineal region

# Perineal Scoring: Score 2



Score 2: Presumed "Moderate" risk of uterine prolapse

Has evidence of some but not all of the following: protrusion, moderate vulva swelling, and swelling of perineal region

# Perineal Scoring: Score 3



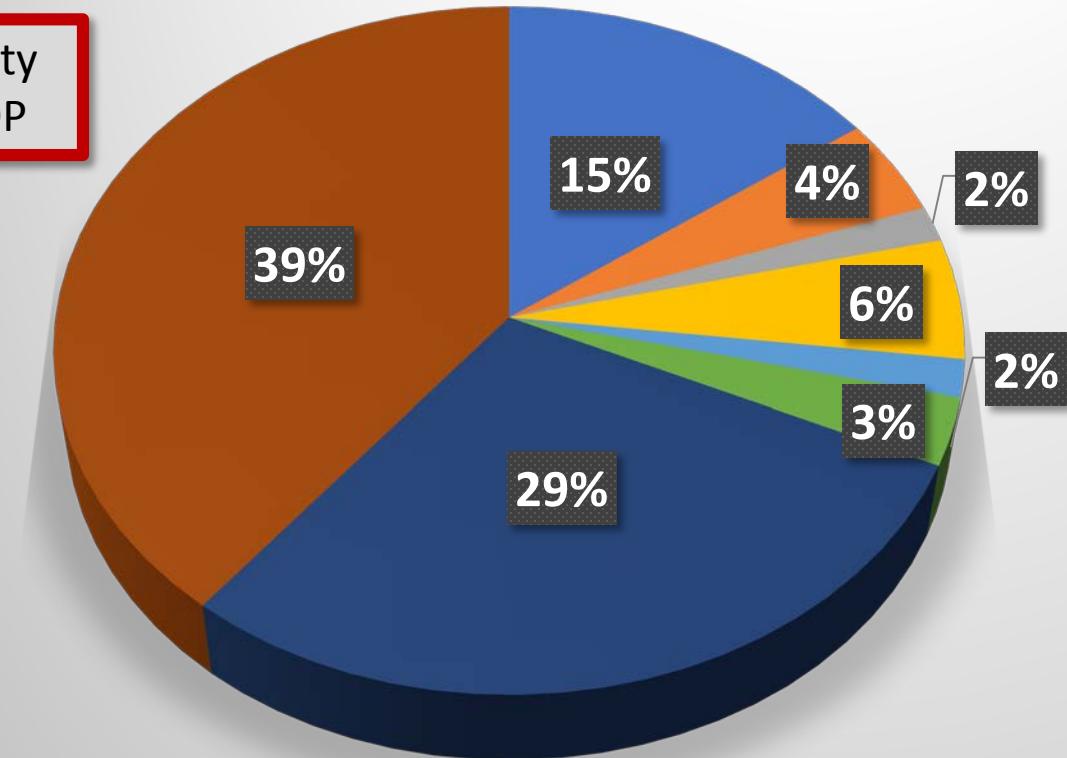
Score 3: Presumed "High" risk of uterine prolapse

Has all of the following: protrusion, moderate to severe vulva swelling, swelling of perineal region, and possible beginning of a prolapse

# Causes of Mortality

## Breakdown of Causes of Mortality

21% of Mortality  
was due to POP



- Vaginal/Uterine Prolapse
- Rectal/Anal Prolapse
- Both Rectal and Vaginal/Uterine Prolapse
- Difficulty Farrowing/Retained Pig(s)
- Disease
- Intestinal (Ulcer) Complications
- Lame/Injured/Downer
- Unknown/Other

## Time for an overhaul of sow removal reasons



**REMOVAL REASONS**

Disease/Health <ul style="list-style-type: none"><li>Discharge (C)</li><li>Downer (E)</li><li>Disease (C,D,E)</li><li>Mastitis/Metritis (C)</li></ul>	Reproduction <ul style="list-style-type: none"><li>No Heat (C)</li><li>Not in Pig/ Preg Check Neg (C)</li><li>Abortion (C)</li><li>Repeat Service (C)</li><li>Vaginal/Uterine Prolapse (D, E)</li><li>Rectal/Anal Prolapse (D, E)</li><li>Difficult Farrowing (C, D, E)</li></ul>
Performance <ul style="list-style-type: none"><li>Age (C)</li><li>Low Total Born (C)</li><li>Retained Pig (C,D,E)</li><li>Low Weaned (C)</li><li>Poor Milker (C)</li></ul>	Intestinal <ul style="list-style-type: none"><li>Ulcer (C,D,E)</li><li>Off Feed (C)</li></ul>
Locomotion <ul style="list-style-type: none"><li>Unsound (C)</li><li>Lame/Injured (C,D,E)</li></ul>	Other <ul style="list-style-type: none"><li>Transfer (C)</li><li>Other (C,D,E)</li><li>Trauma (C,D,E)</li></ul>

Reason type: C= cull, D= Death, E= Euthanized

402-727-6600 [www.swinemms.com](http://www.swinemms.com)

National Hog  
Farmer August  
2017

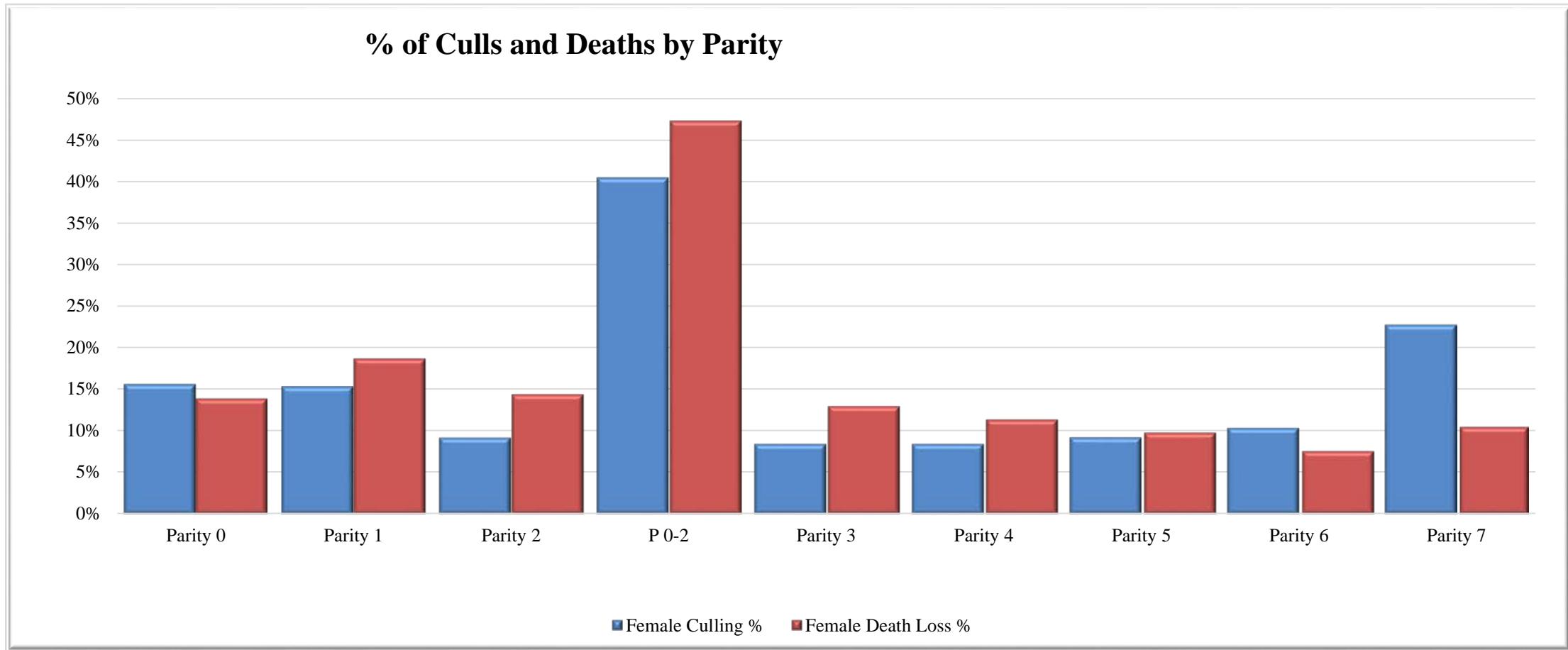
# Low sow mortality: What's the secret?

Ron Ketchem, SMS  
AASV 2019

Data from 17 farms over three years  
Most frequent reason codes

<b>Other/unknown</b>	<b>25.5%</b>
<b>Lame/injury</b>	<b>19.3%</b>
<b>Downer</b>	<b>17.4%</b>
<b>Farrowing difficulties</b>	<b>13.1%</b>
<b>Prolapses</b>	<b>8.89%</b>

# Breakout of SMS Data of Farm-888 farms



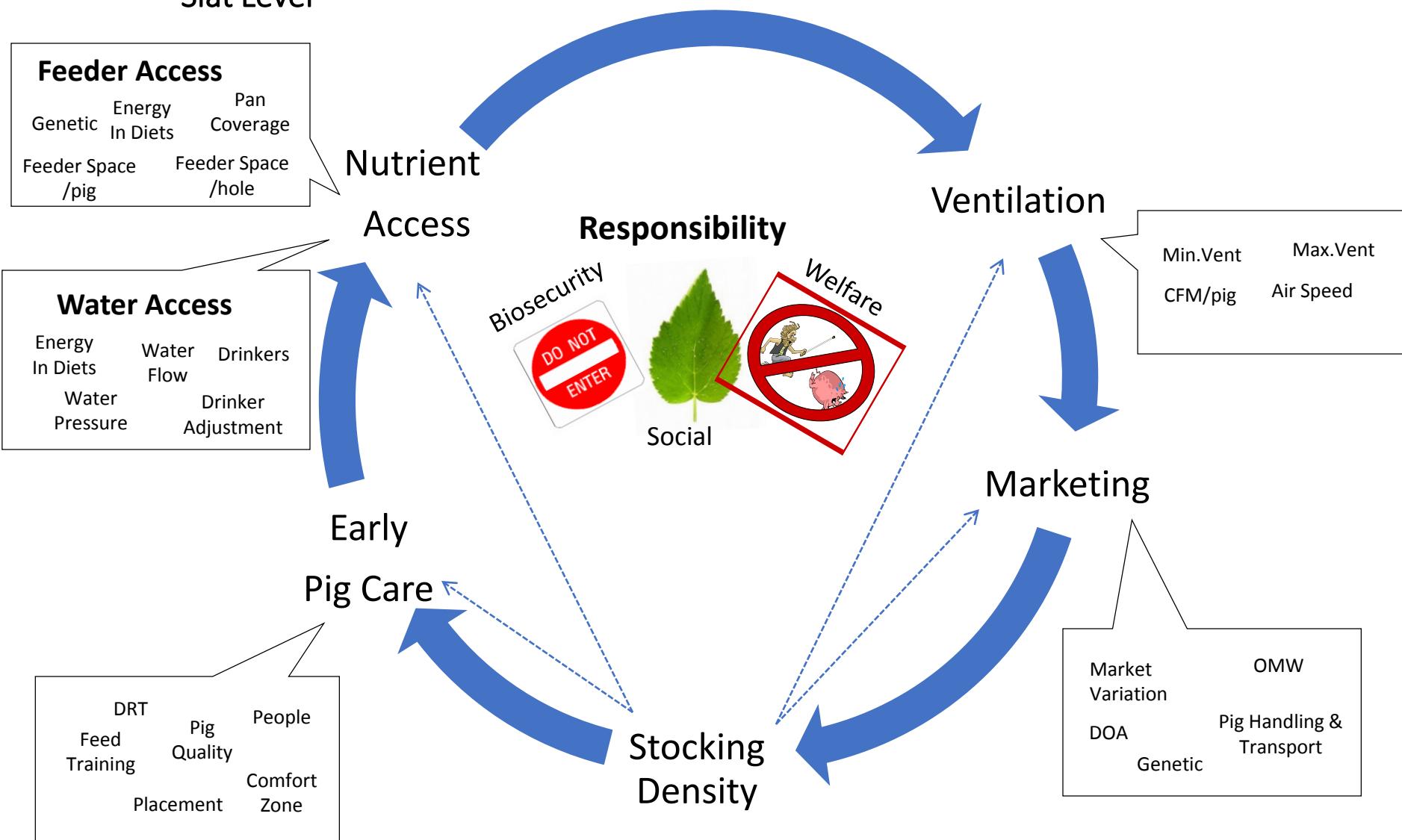
Source: NHF 3-29-2019 SMS data

# Solutions:

- Proper gilt development & acclimatization are essential
- How you receive herd replacements requires options
  - Isolation for incoming gilts is required – 6 weeks
  - Allow time for vaccinations & start acclimatization
  - Test for major viruses & Mhp before sow herd entry
  - With ESF systems start training at a younger age
  - Internal GDU give more flexibility but you must have proper selection
- Acclimatization is key
  - Major virus – PRRSV, PEDV
  - Lesser viruses – IAV
  - Bacterial – increasing factor
    - HPS, Strep suis
    - Mycoplasma's – hyopneumonia, synoviae & hyorhinus

# Five Key WF Factors

Slat Level

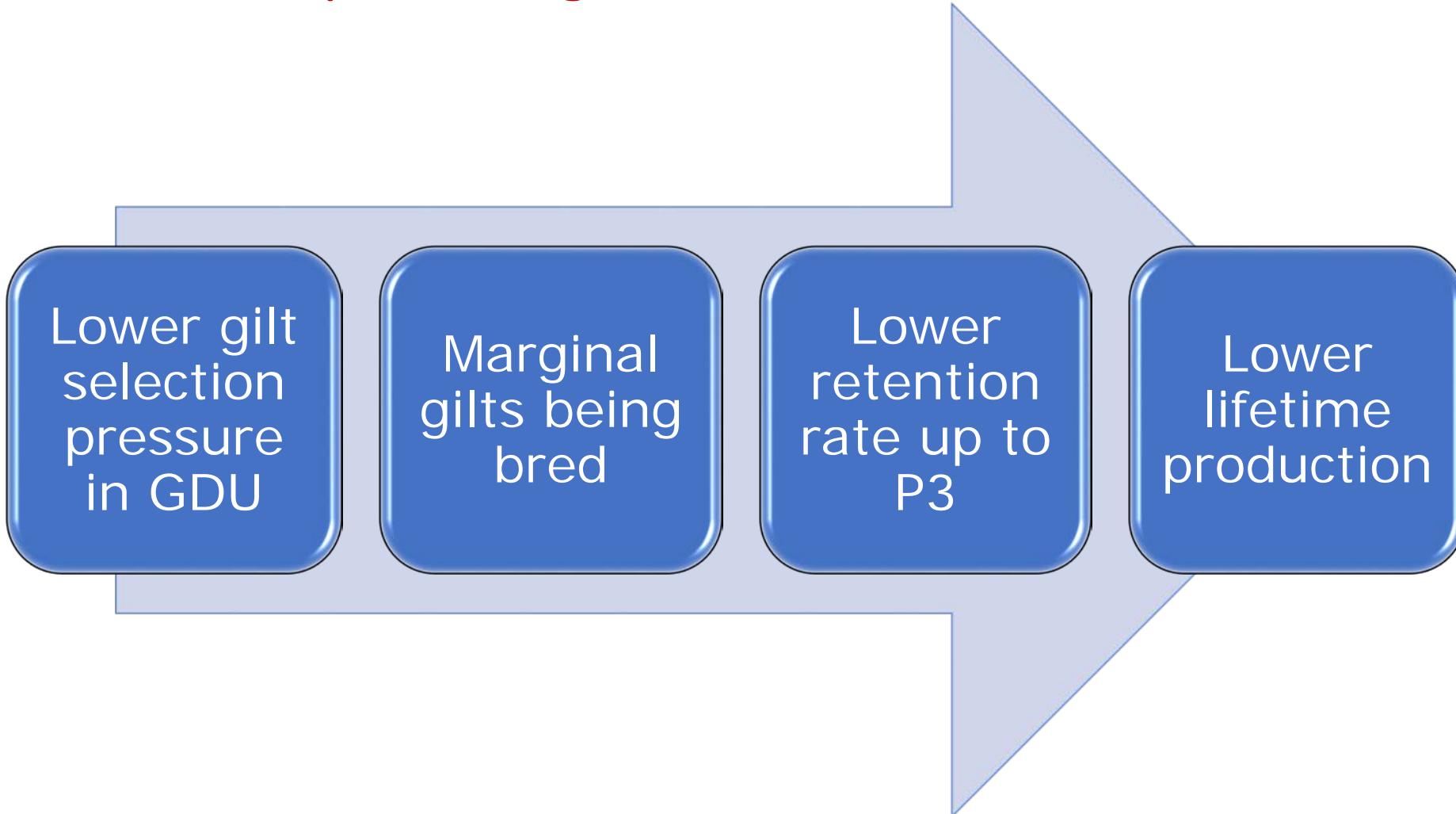


# Solutions continued

- Adequate selection pressure – replacements
- Younger parity retention
- Group housed facilities can have 2X the lameness prevalence as individual housing system, may require more replacements.
- Proper foot & hoof care are essential
- Start boar exposure at the proper age/weight & intensity
- Breed on 2<sup>nd</sup> or 3<sup>rd</sup> estrus at 136 kg.

# Gilt Selection And Performance

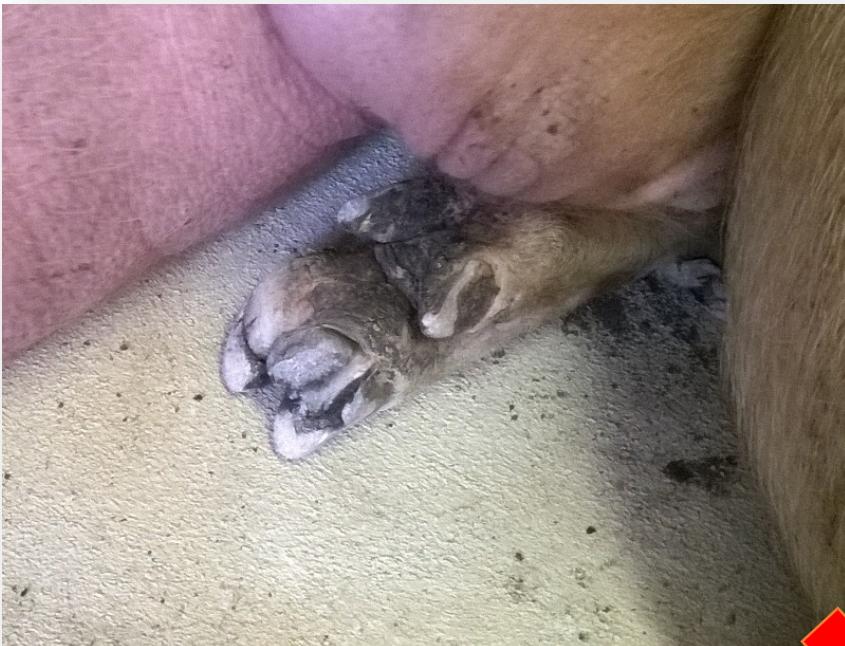
## Group Housing

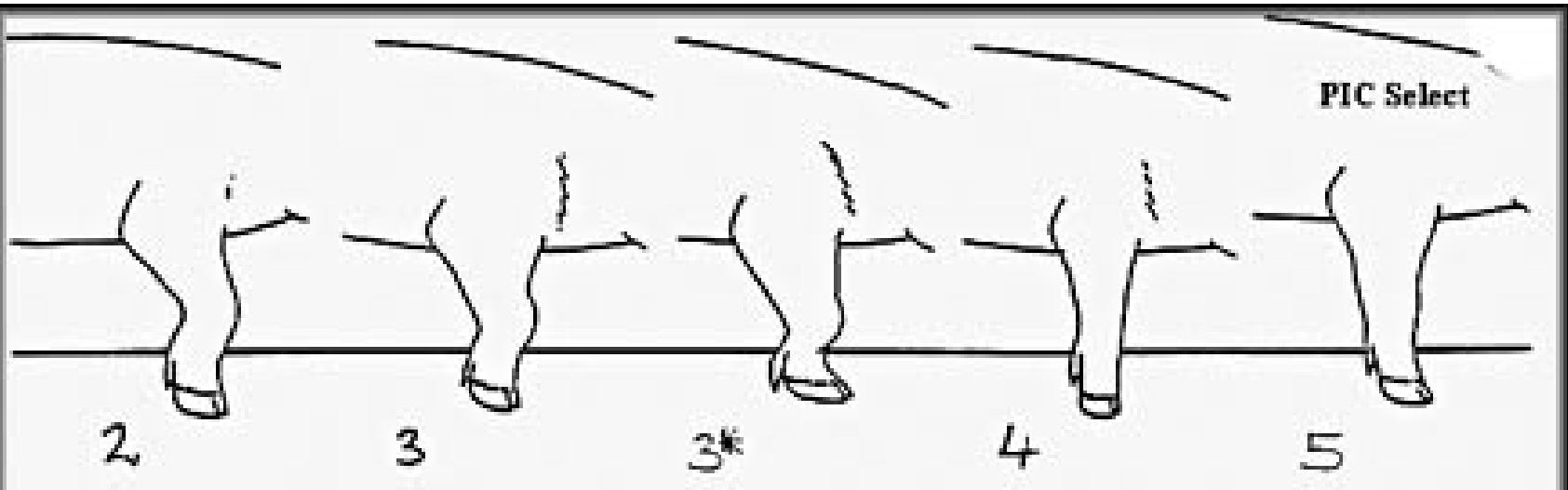


# Gilt & sow retention for group housing

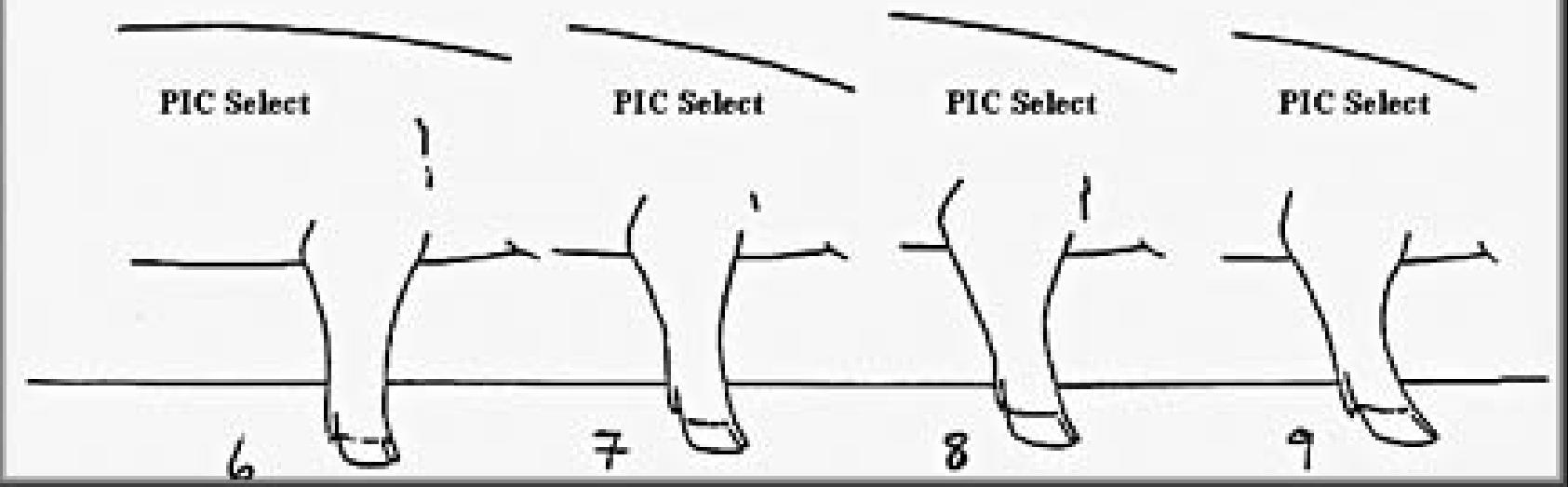
## Hoof Integrity

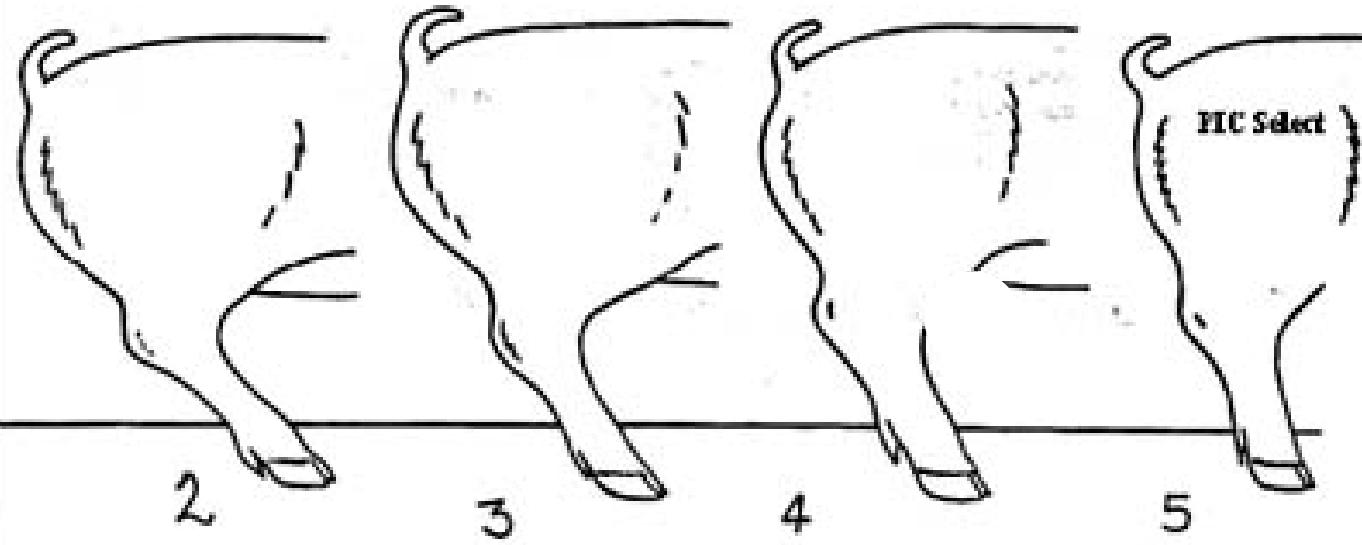
**Do not utilize these animals.**



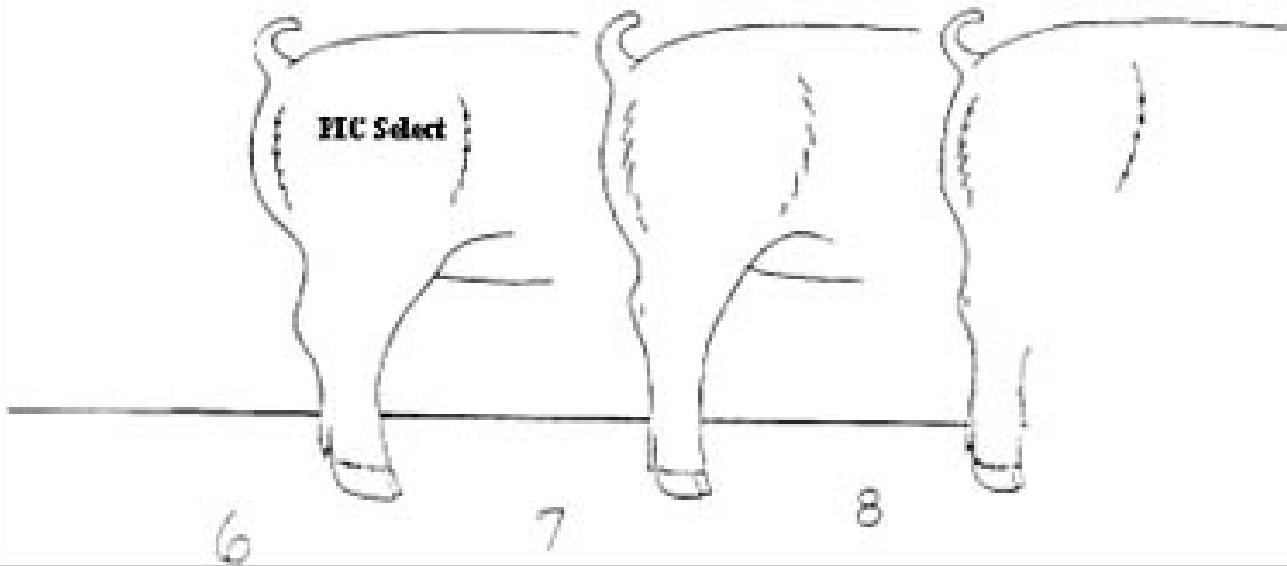


## The Full Range of Front Leg Scores





## The Full Range of Back Leg Scores



# Take home message

- Gilt replacements are the life blood of the sow farm. They need to be treated as such throughout their growing period by giving them adequate space, feed and water availability and daily treatments if needed.

# Observations of Sow Farm Visits

- Commercial farms with on-site GDUs
  - Quality of gilt replacements
  - Stress levels, for ESF training
  - Allow more time for training
- Water availability in gestation –
  - Pens - 1 water source/10 gilts or sows
  - Stalls – nipple water preferred, trough adequate availability
- Maximize lactation feed intake
- Focus on P1 retention
- Get weaned sow body condition to target by 25 days post breeding
- Be more aggressive in identifying sows lame or loosing condition in the pens.

# Food for thought

- Labor availability is an increasing concern
- Focus on employee retention & setting correct expectation for new employees
- More individual animal care
- Make one person on each farm responsible for individual animal care to improve accountability
- Group housing management is a challenge
  - We must accept the challenge and improve our husbandry skills
  - ESF systems require more training for gilts
  - Improve timeliness of detection of non-eating females
  - Foot and hoof care is essential

Thank you