

Elevating the Future of the Herd: Gilt Development Updates

What we know about Gilt **Fertility**
Quadrant, **Minimum Age** at First
Insemination and **Peripartum**

PIC team

PIC[®]



Table of contents


Never Stop Improving

Where we are today

PIC

© Pig Improvement Company | 15

What we know Today



Never Stop Improving

Field Data Analysis

PIC

© Pig Improvement Company | 20

What we are learning



Never Stop Improving
Your Success

What we need to consider

PIC

© Pig Improvement Company | 30

What can be implemented





 Never Stop Improving

What we know Today

Key points:

- Industry trend – Retention
- Age at Puberty
- Estrus at service
- Growth genetic trends
- Teat count – Weaning capabilities

What We Know Today

Let's start with the end in mind

- Sow retention was and it is a challenge today in the industry
- Gilt reproduction and puberty development is key to maximize lifetime performance
- Today's gilt have higher and more efficient growth rates
- Lactation feed intake is a key driver to balance weaning capacity and body reserve mobilization, mostly on P1 females
- Gilt development has to evolved into P1 development

Sow lifetime productivity – Trends and Opportunities

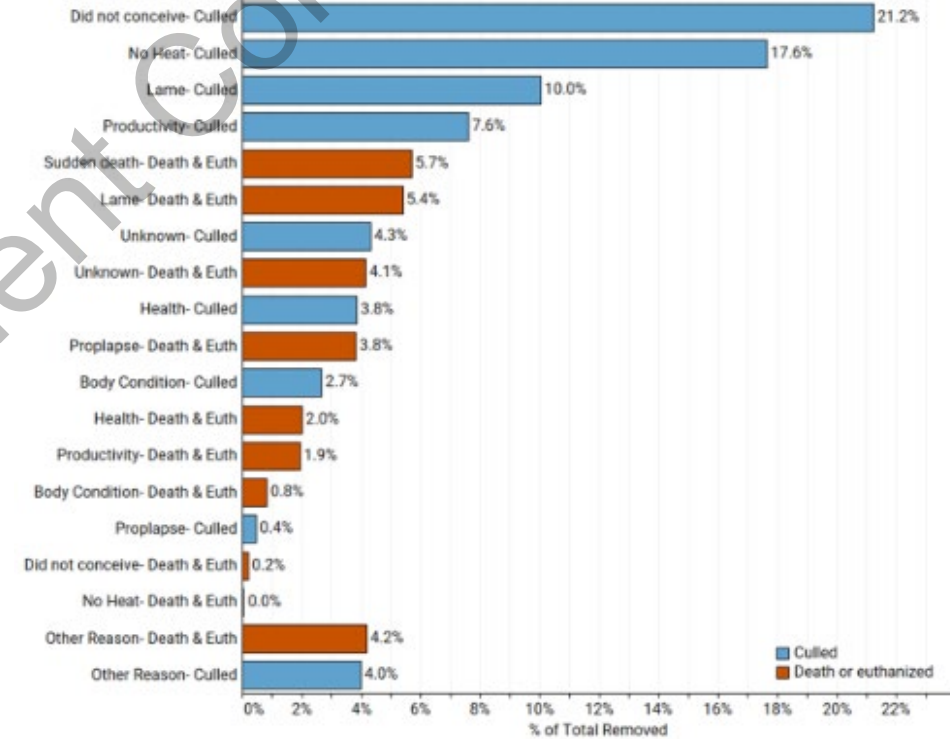
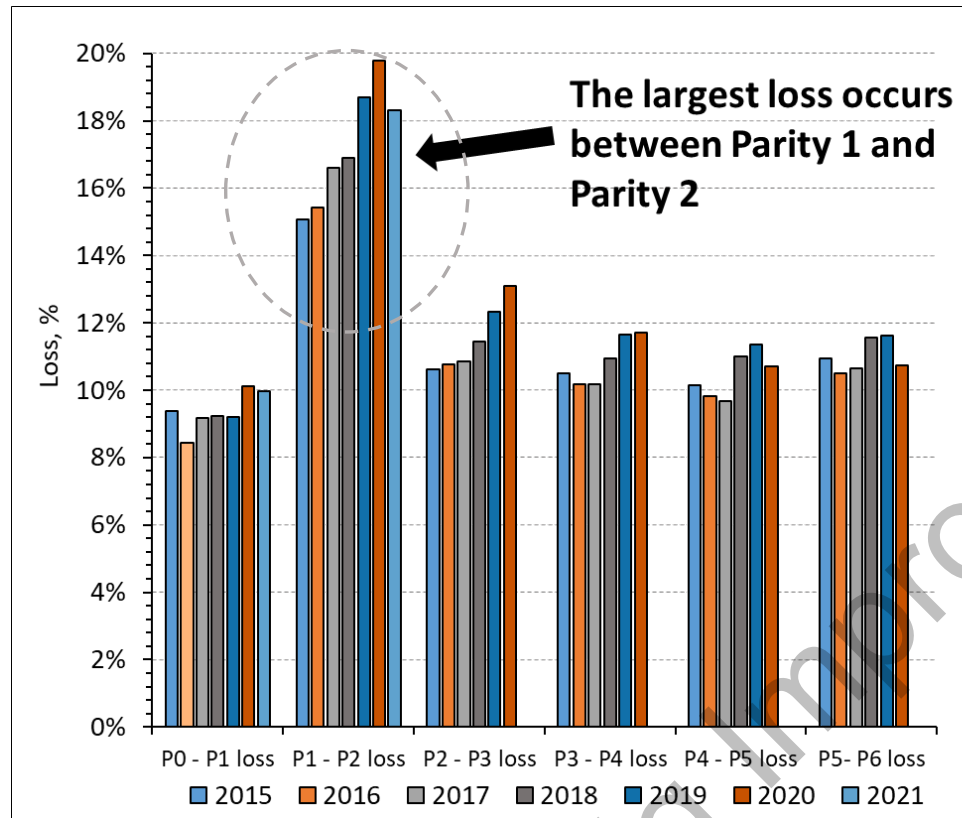
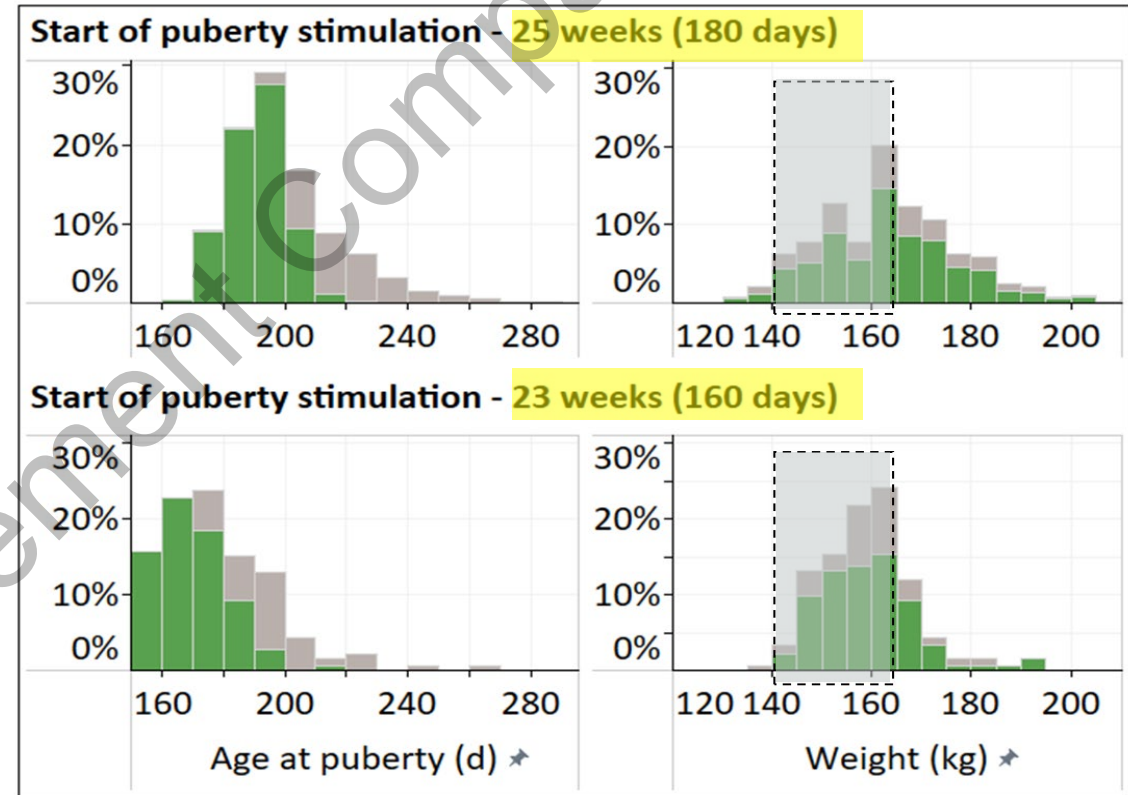
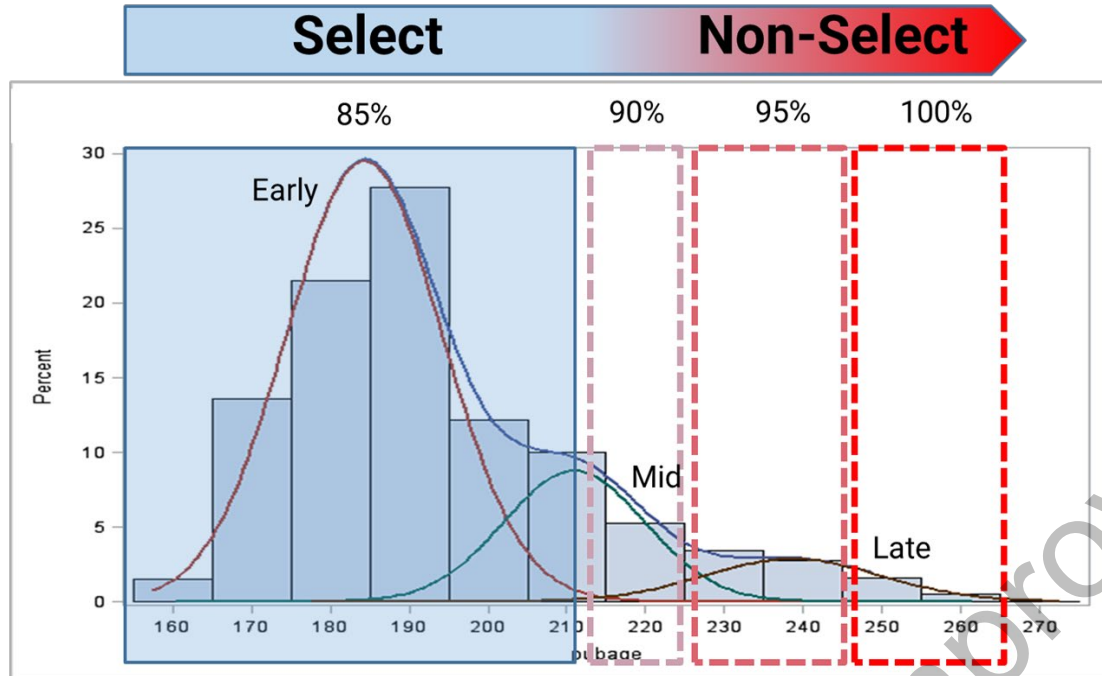


Figure 3. Breakdown of removal reason between parity 1 and parity 2.

Age at Puberty



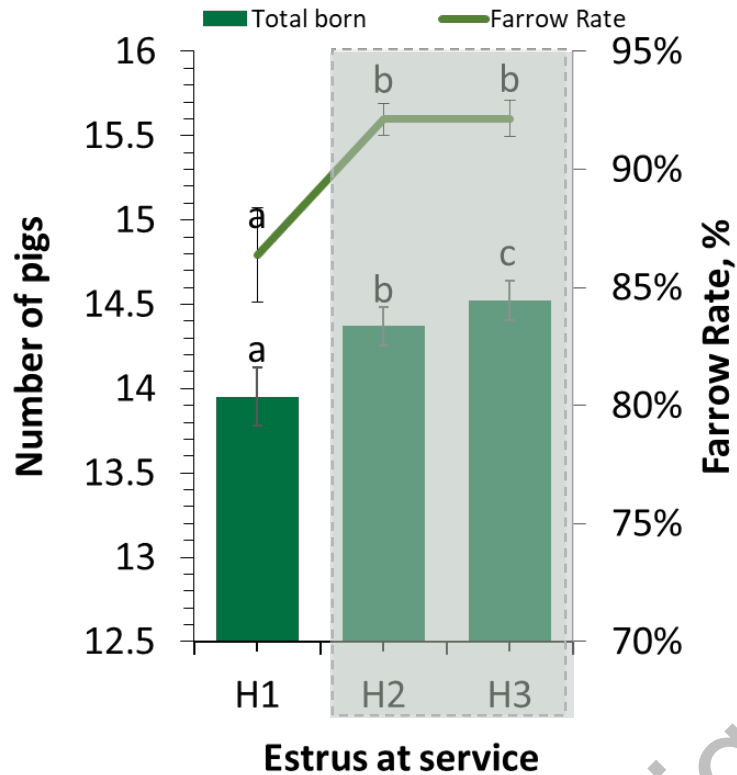
Early responses to effective boar stimuli is the critical selection tool

- Start Boar Stimulation early (23-24 weeks)
- A recorded heat not service before 190d of age
- This allows “Select” gilts to be bred at second estrus and target weight range.

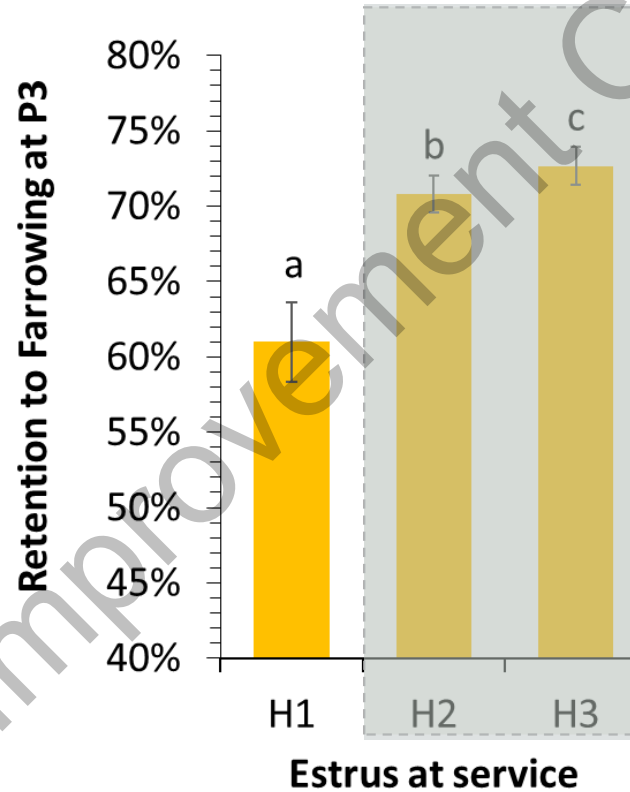
Estrus at Service

1st parity

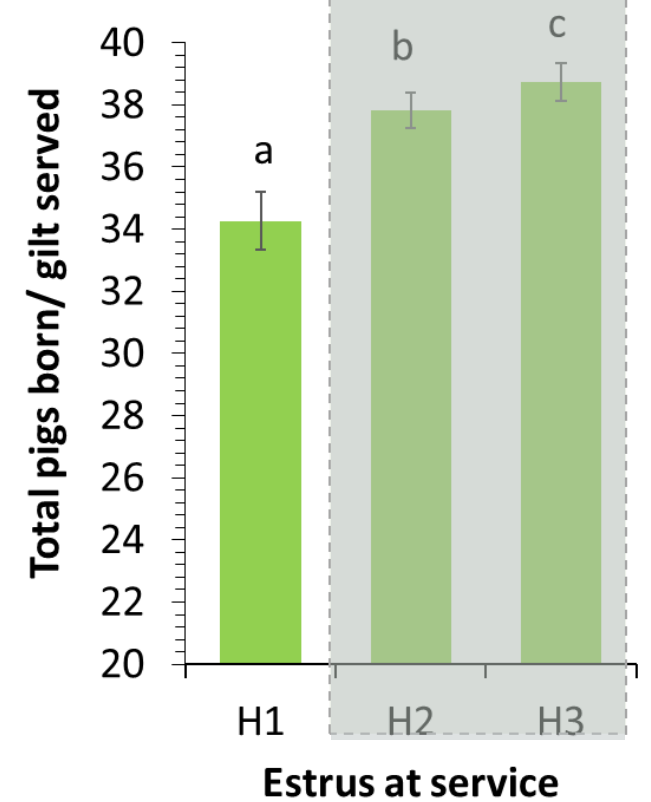
Farrow rate & total born:



Retention to P3:



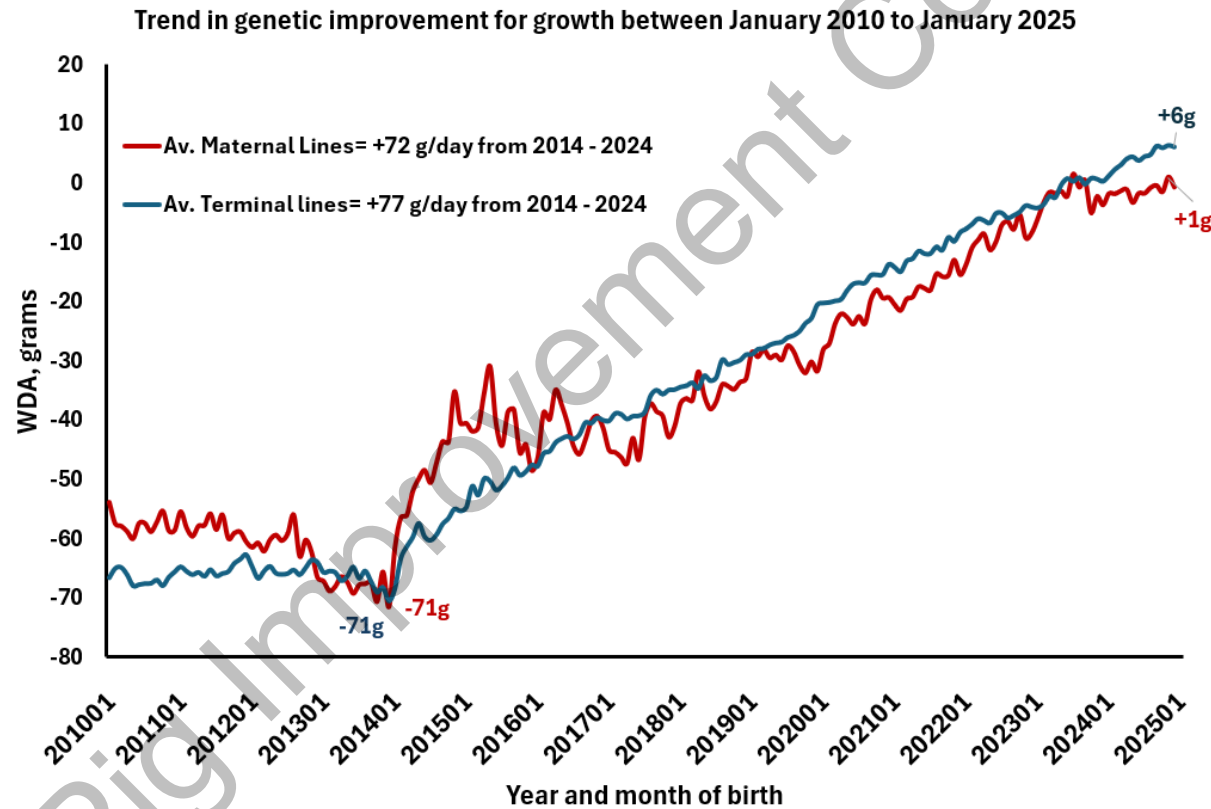
Total pigs born to P3:



Genetic Improvement Over the Years:

Growth performance: Terminal and maternal lines

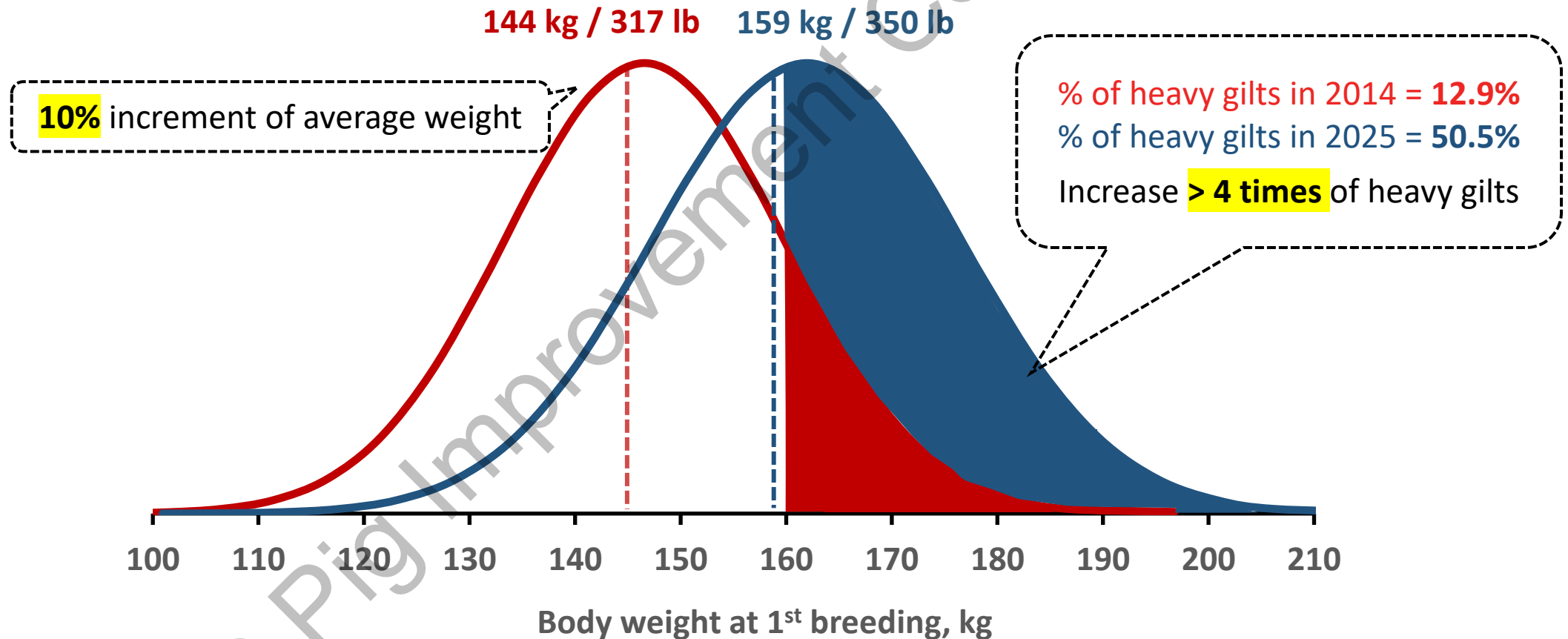
Besides improved reproductive traits, today's modern genotype females are also faster-growing than their predecessors



Genetic Improvement Over the Years: Impacts of the improving growth potential

Never Stop Improving

Increasing average age at first breeding (d210 of age)
significantly increased the % of heavy gilts (> 160 kg/350 lb)



PIC®

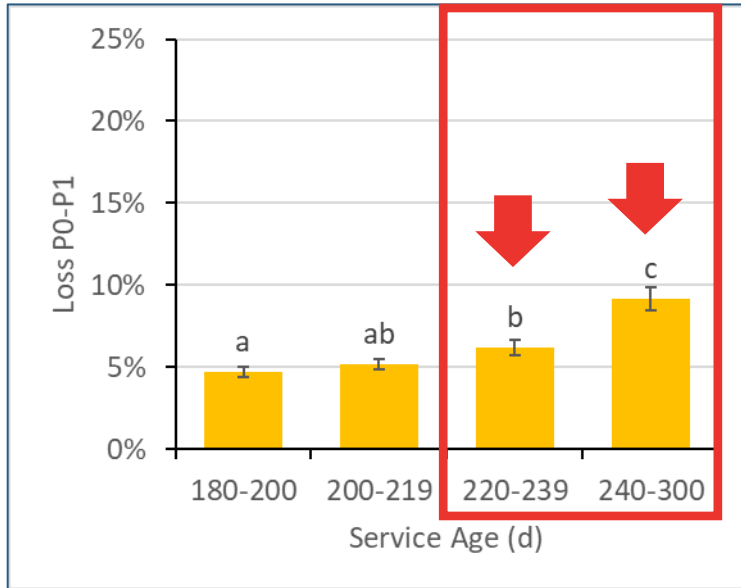
- * Orlando et al. 2022
- * Data from L02 and L03 gilts
- * Assuming 3 years of genetic gap from genetic farms to field

P1 Development:

What we know today about minimum breeding age

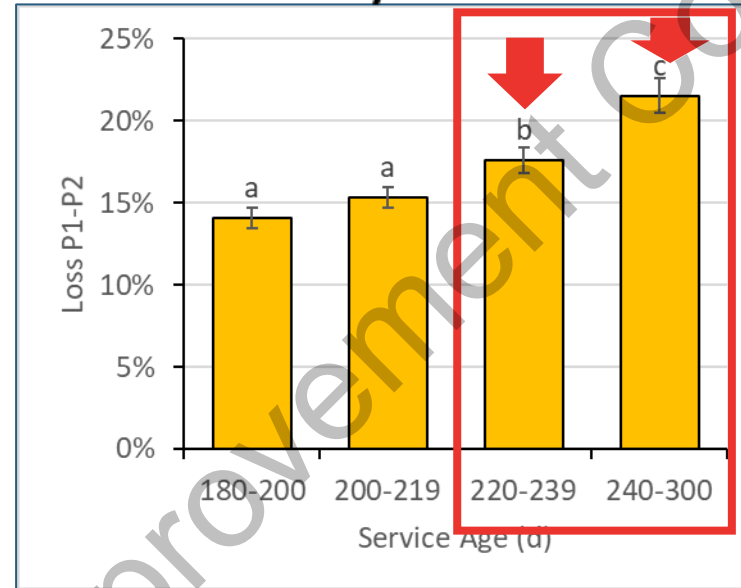


Parity 0 Loss



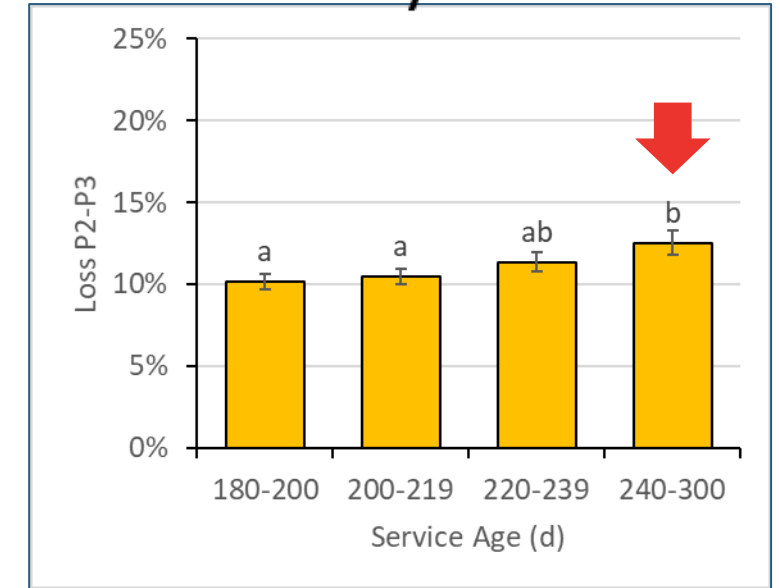
Service Age (d) <.0001 HNS (Y or N) 0.0003 Age x HNS 0.3682

Parity 1 Loss



Service Age (d) <.0001 HNS (Y or N) <.0001 Age x HNS 0.2320

Parity 2 Loss



Service Age (d) 0.0063 HNS (Y or N) 0.8123 Age x HNS 0.2327

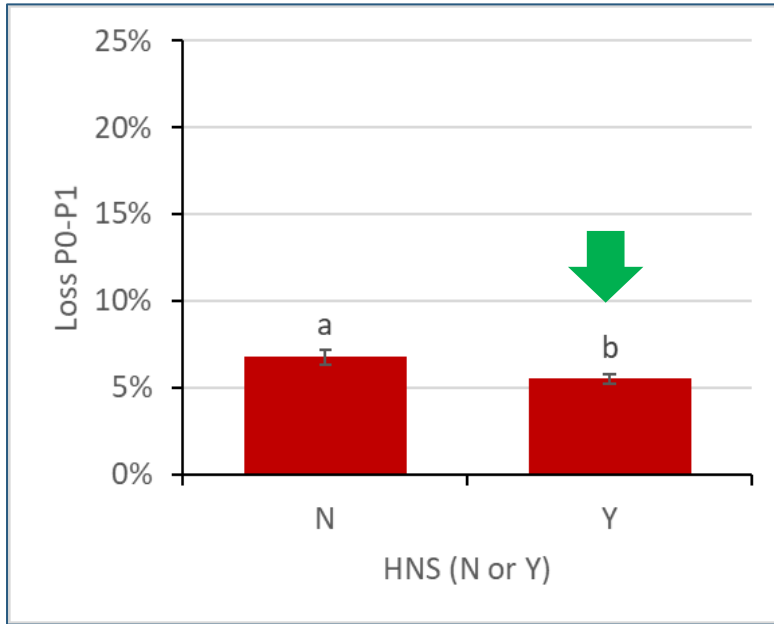
- Gilts bred older have higher Losses across parities compared to younger ages (Red arrows)
- Losses are higher between the first and second parity (Loss P1 – P2)

P1 Development:

What we know today about Heat Not Service

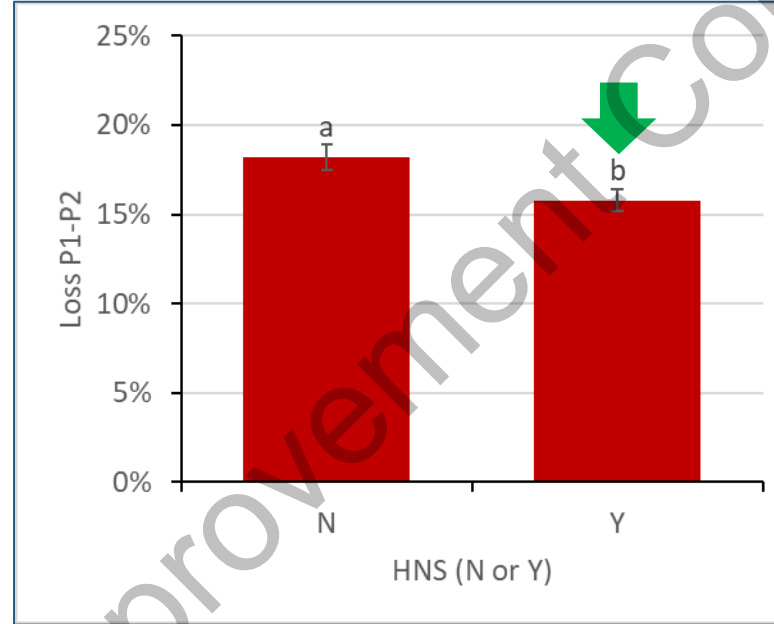


Parity 0 Loss



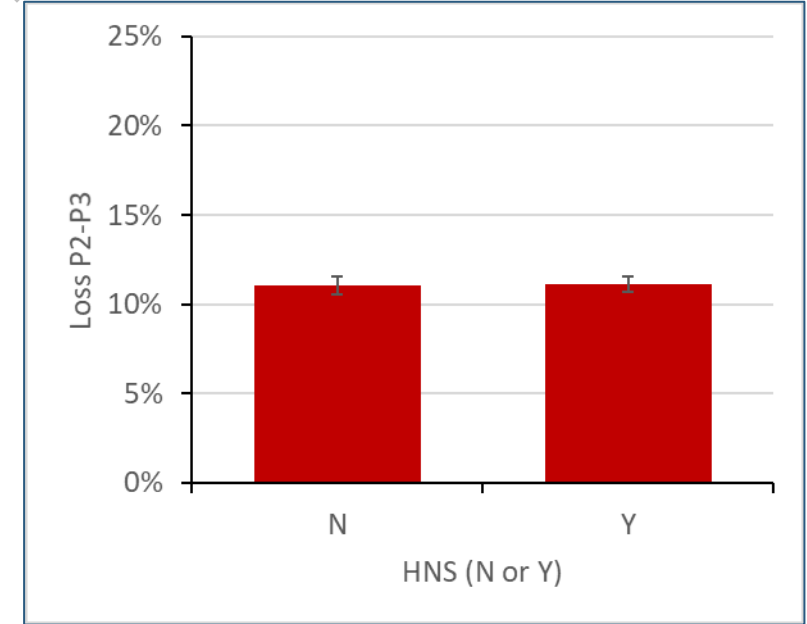
Service Age (d) <.0001 HNS (Y or N) 0.0003 Age x HNS 0.3682

Parity 1 Loss



Service Age (d) <.0001 HNS (Y or N) <.0001 Age x HNS 0.2320

Parity 2 Loss



Service Age (d) 0.0063 HNS (Y or N) 0.8123 Age x HNS 0.2327

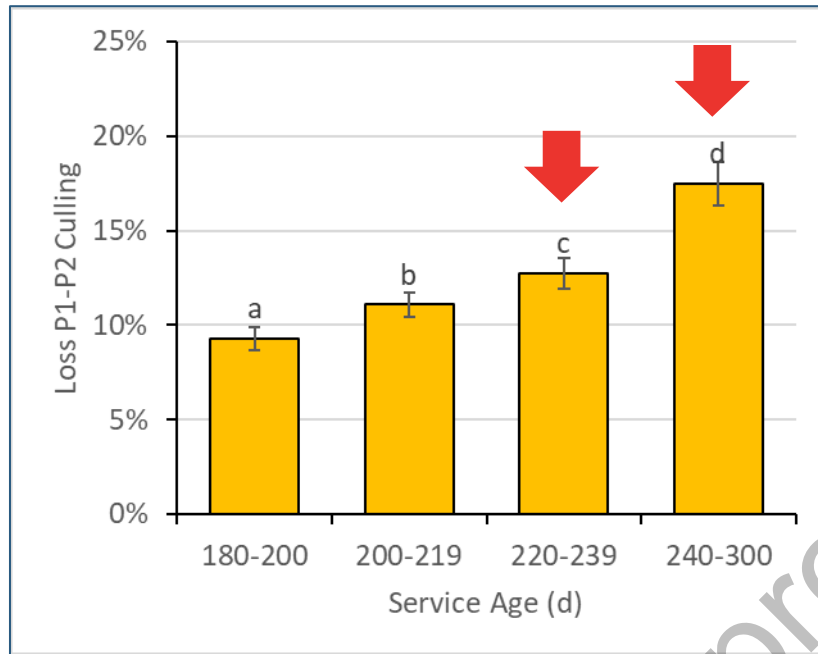
- Gilt bred with a previous HNS recorded have lower losses
- Heat not service protect retention rate at younger parities (Green arrows)

P1 Development:

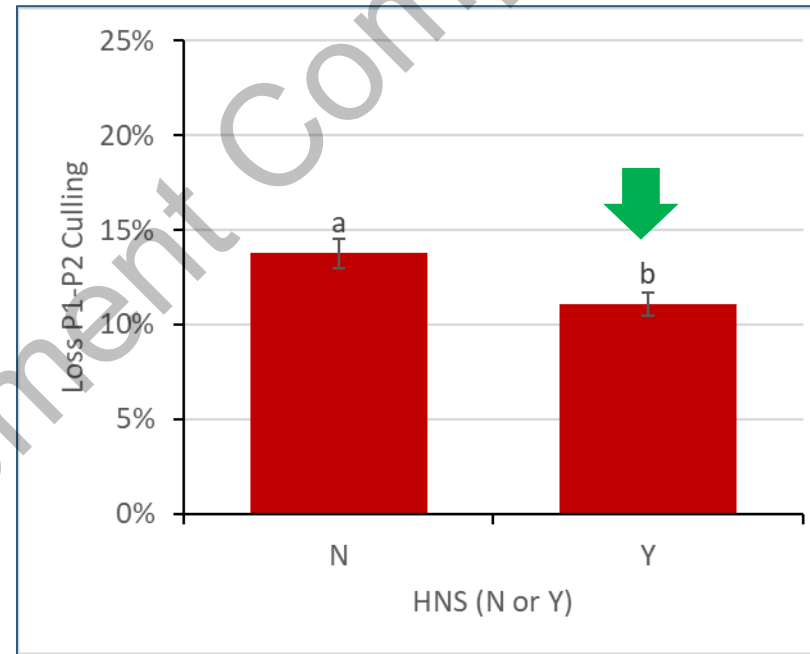
What we know today about P1 to P2 retention - Culling



Parity 1 Loss (Culling)



Service Age (d) <.0001 HNS (Y or N) <.0001 Age x HNS 0.4273



Service Age (d) <.0001 HNS (Y or N) <.0001 Age x HNS 0.4273

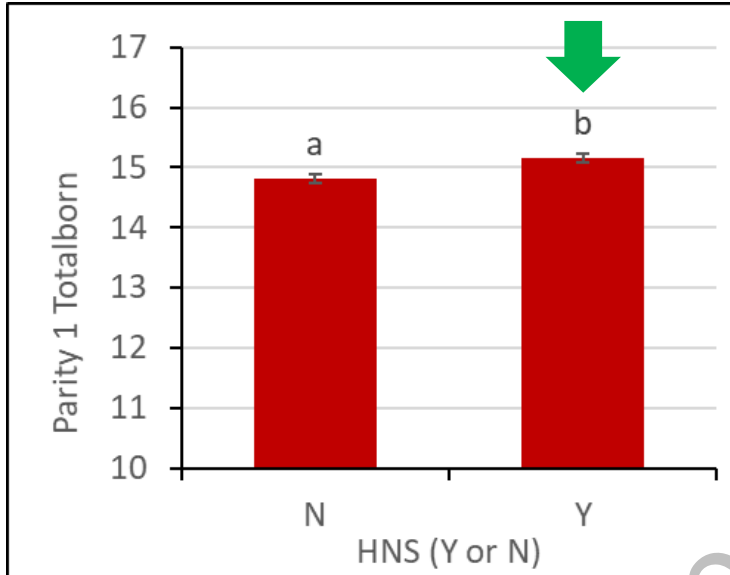
- Main factor associated with P1-P2 losses is culling
- Gilt bred older have a higher chance to be culled between P1 and P2 (Red arrows)
- Heat not service protect retention (Green arrow)

P1 Development:

What we know today about HNS

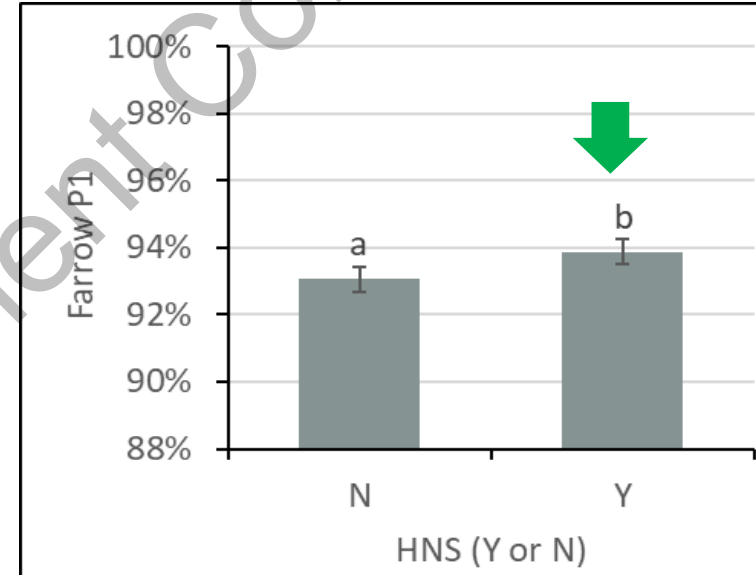


Parity 1 – Totalborn



Service age (d) <.0001, HNS (YorN) <.0001, Age x HNS 0.9578

Farrow Parity 1

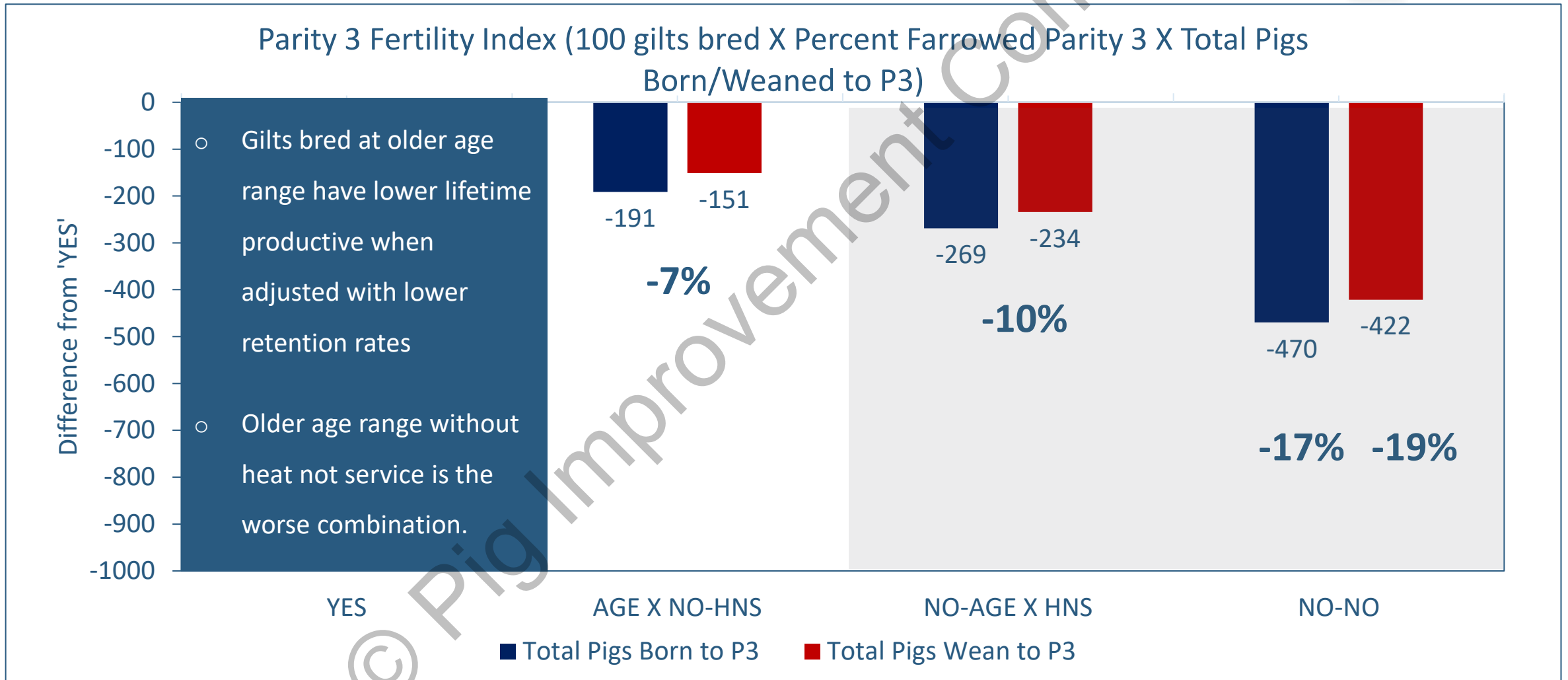


Service age (d) <.0001, HNS (YorN) <.0249, Age x HNS 0.5422

- Heat Not Service program also have a positive impact on litter size at first farrowing and Farrowed rate

Sow Lifetime Productivity

Gilts bred at older age have lower Parity 3 Fertility Index (less pigs and lower retention)





 Never Stop Improving

 Never
Stop
Improving
Your Success.

What we are learning

Peripartum Metabolism
Weaning Capacity

PIC[®]

© Pig Improvement Company

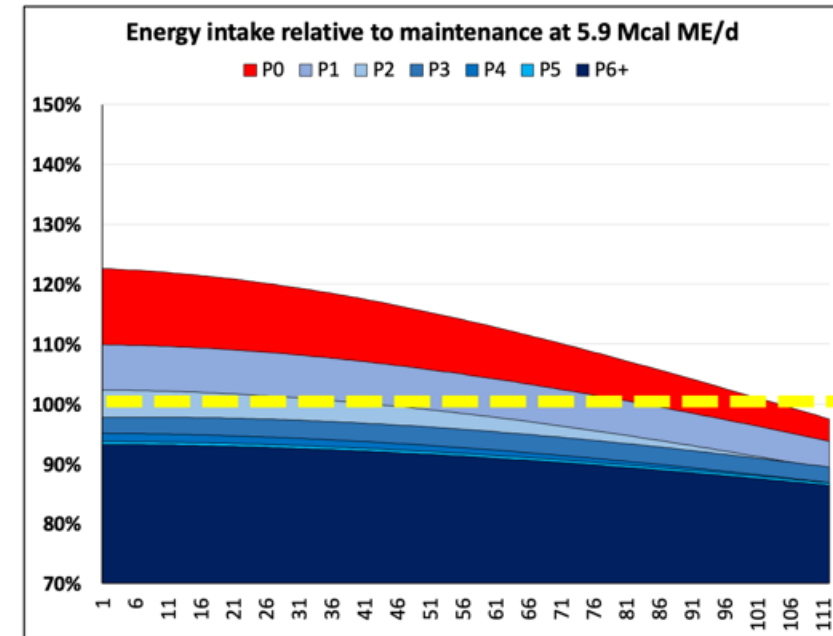
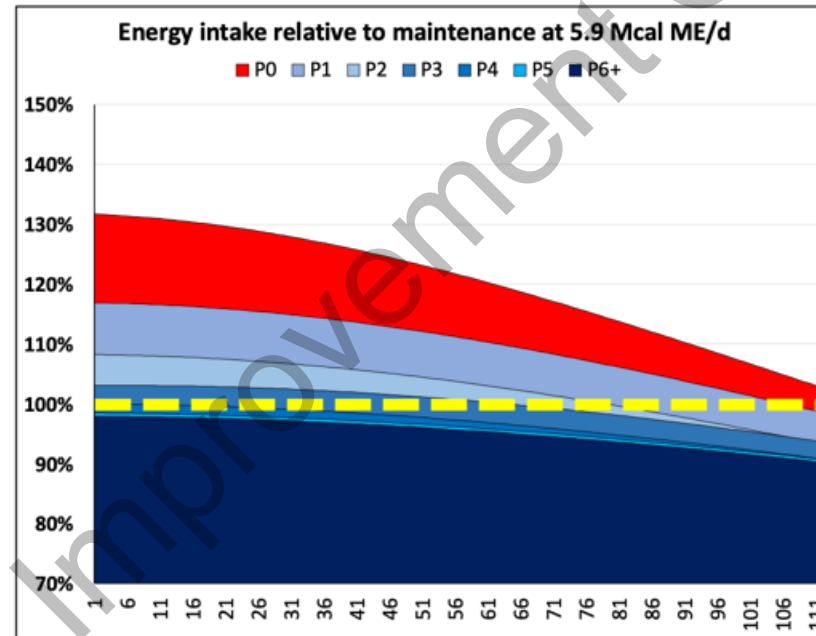
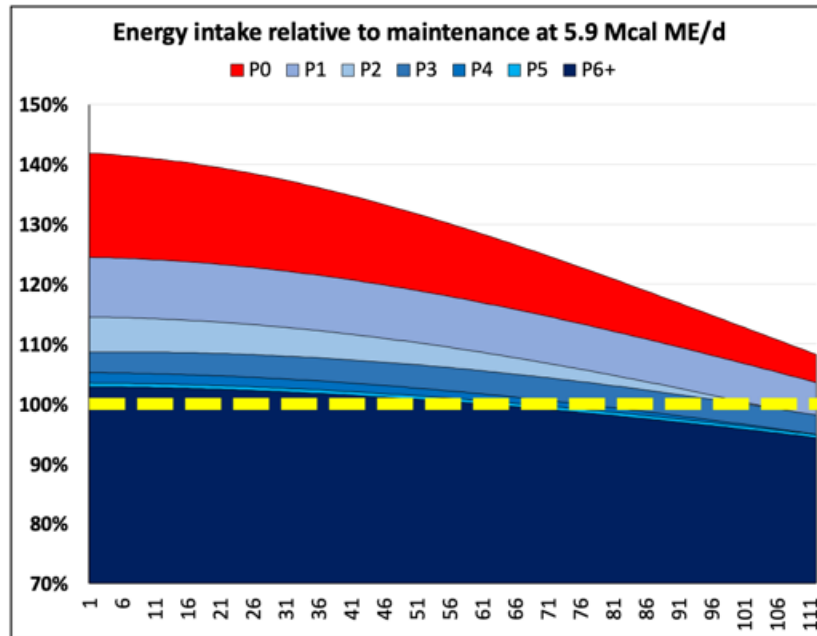
Heavier gilts will become heavier sows

Gilt Body Weight at Breeding

144 kg or 317lb

159 kg / 350 lb

175 kg / 385 lb



- Heavier gilts bred will become heavier sows, and their future maintenance needs are higher
- There is a potential risk to not cover their maintenance in subsequent older parities during late gestation.

Nutrition and Feeding During Gestation

When average gilt breeding weight is >160 kg (350 lb)



It assumes a minimum daily intake of 6.8 g of STTD Phosphorus and 11.0 g of SID Lysine

RECOVERY SOWS



8.6 (ME) or 6.5 (NE) Mcal/day



IDEAL AND OVER CONDITIONED SOWS



6.65 (ME) or 4.95 (NE) Mcal/day

When average gilt breeding weight is <160 kg (<350 lb), the base level for sows can be 5.9 (ME) or 4.4 (NE) Mcal/d.



GILTS



5.9 (ME) or 4.4 (NE) Mcal/day



1 to 30

31 to 60

61 to 90

90 to 112

Peripartum

use lactation diet

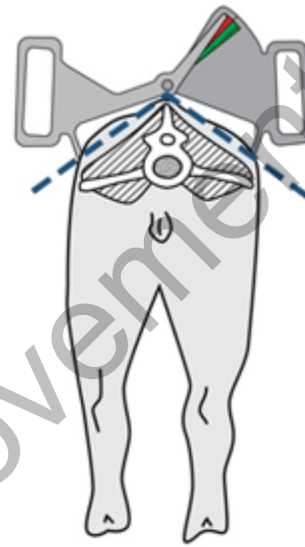
Days of gestation



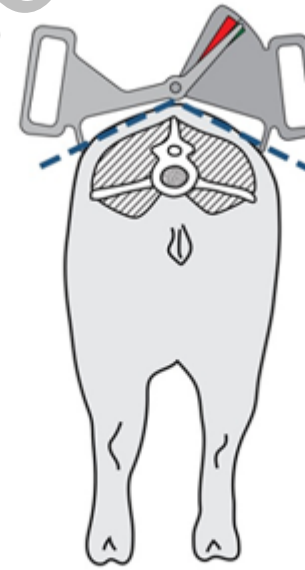
Please note that the **feeding levels should be adjusted** by body condition (**feed to the caliper**). The baseline feeding levels need to be constantly monitored based on feed density, health, season, group housing, av. gilt breeding weight, etc.

The Body Condition Caliper

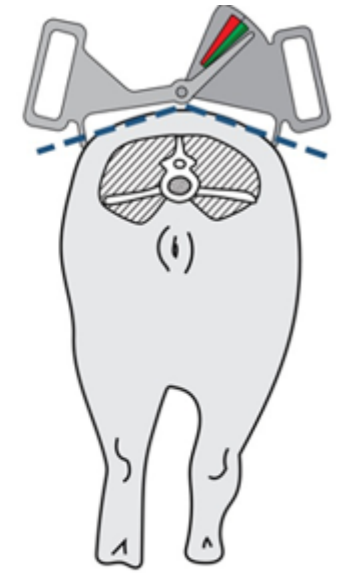
Never
Stop
Improving
Your Success.



RECOVERY
Undercondition

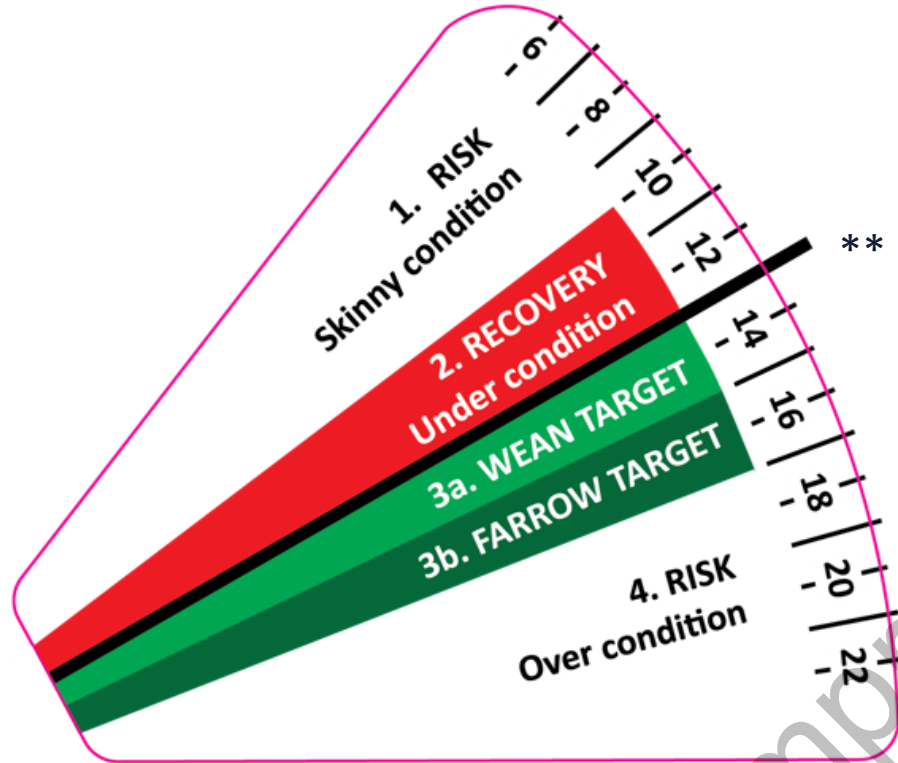


TARGET
Ideal condition



RISK
Overcondition

Updated Caliper Sticker



Categories:

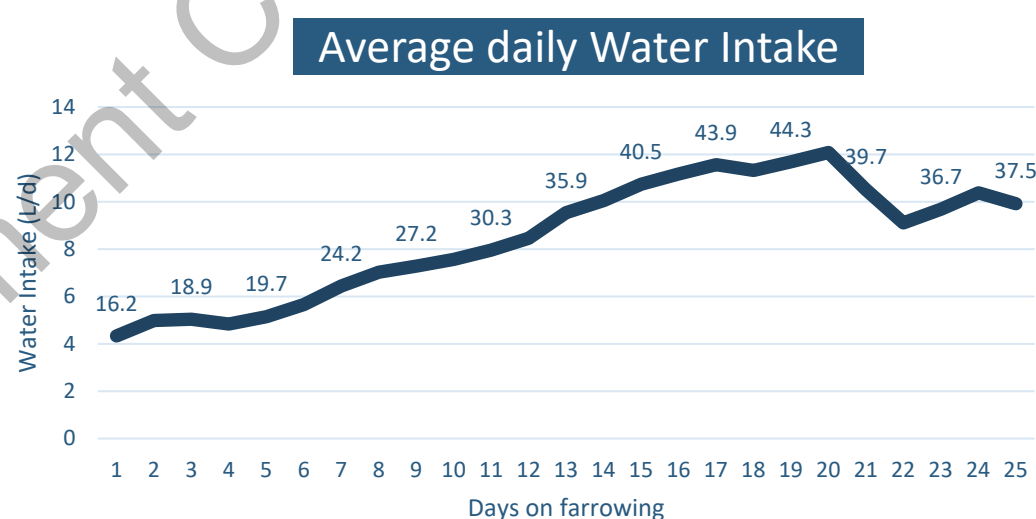
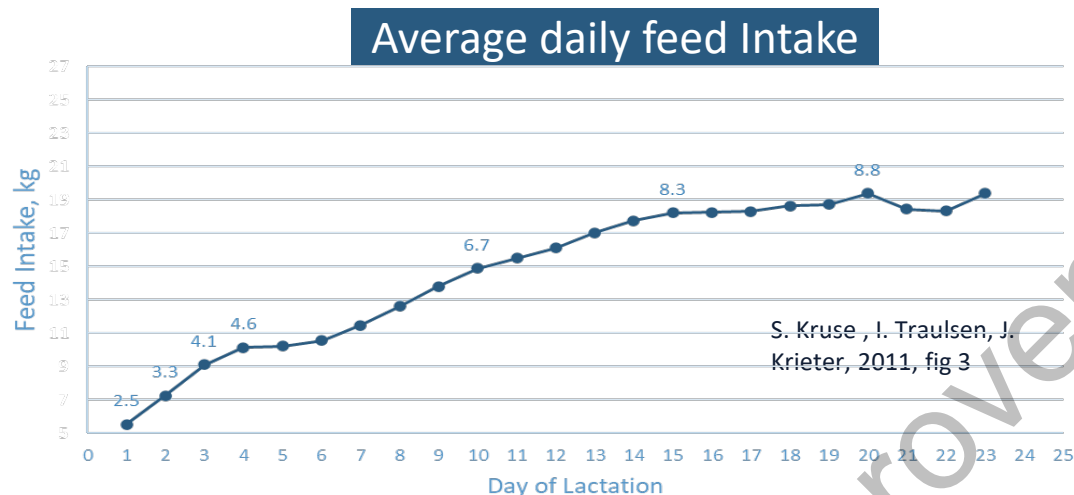
- ① Risk: Skinny condition
- ② Recovery: Under condition
- ③ Target: Ideal condition
 - 3a: Wean target (13 and 14)
 - 3b: Farrow target (15, 16, and 17)
- ④ Risk: Over condition

PIC®

** Caliper measurements that fall between the recovery and target categories should be treated as recovery for feeding purposes.

Feed Intake and Water Intake in Lactation

Feed to water intake ratio is ~ 1:5



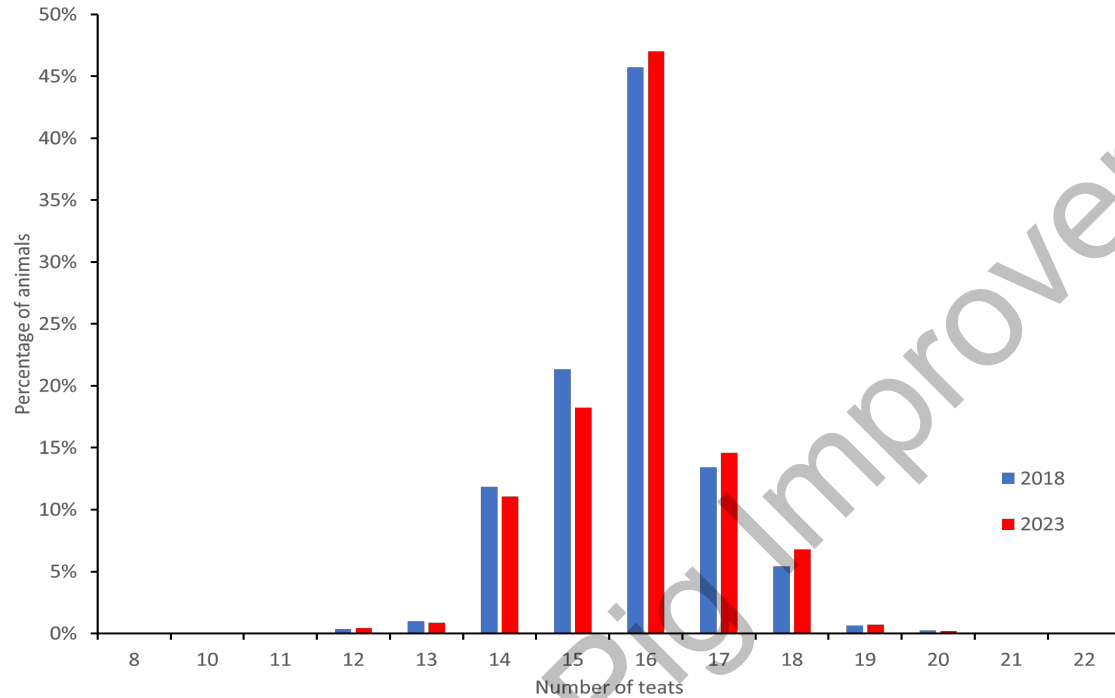
- Sows required 800 L of blood to produce 1 L of milk – Cardiovascular stress and dehydration.
- One Liter of milk requires 2.5-3L of water. Piglets need 4L milk per 1kg weight gain.
- Out of the total water intake during lactation, the first 15 L (4 gal) at day 1 post farrowing are the most critical.

Number of Teats Improvement and weaning Capacity



- Improvement of number of functional teats overtime increased the potential to pig weaned per farrowing
- To capture that potential sow care and litter management is needed as born alive could exceed the teat count

2018: 65% of animals have 16 teats or more
2023: 69% of animals have 16 teats or more



PIC Elite Farms 2018 vs 2023, teat distribution.

How Many Pigs a Sow Should Nurse?



Effect of Piglet Load treatment on piglet performance

Trait ¹	Piglet Load above teat count			
	0	+1	+2	SEM
Total Born, n	17.19 ^b	18.18 ^a	18.18 ^a	0.251
Born Alive, n	16.20 ^b	17.09 ^a	17.31 ^a	0.235
Teat Count, n	16.02 ^a	15.81 ^a	15.44 ^b	0.090
Pigs on test per sow, n ²	16.05 ^c	16.81 ^b	17.43 ^a	0.090
Pigs weaned per sow, n	14.95^b	15.41^{ab}	15.65^a	0.188
Piglet mortality, n	1.09 ^b	1.41 ^{ab}	1.81 ^a	0.173
Piglet mortality, %	6.74^b	8.27^{ab}	10.30^a	1.012
Piglet averages:				
Start Weight, lb ²	3.28	3.20	3.18	0.036
Wean Weight, lb	11.34 ^a	10.63 ^b	10.17 ^b	0.147
Average Daily Gain, lb	0.67^a	0.65^{ab}	0.63^b	0.009
Average Daily Gain with removals, lb	0.66 ^a	0.64 ^{ab}	0.62 ^b	0.009
Total litter:				
Start Weight, lb ²	52.60 ^b	53.75 ^{ab}	55.39 ^a	0.64
Wean Weight, lb	182.0	181.4	176.2	3.04
Weight Gain, lb	178.7	178.2	173.0	3.02
Weight Gain with removals, lb	182.1	181.4	180.1	2.80

- Trial to understand sow weaning capacity and retention up to P3
- Cross foster done during the first 24 hours
- No fall behind were pulled
- Adding +1 or +2
 - Reduce Growth rate and weaning weight
 - Increase pre-weaning mortality
 - Higher number of pigs weaned per farrow
- Not intended to be a management recommendation
- Economic analysis must be considered

¹Number of observations: 0 = 88 - 138, 1 = 83 - 137, 2 = 78 - 140

²Study started at crossfostering within 24 h of birth

^{ab}Different letters indicate a statistical difference at $P < 0.05$.



Never
Stop
Improving
Your Success.

What can be implemented

P1 Development:

GDU key management practices



- **Puberty induction**

- Start puberty induction and boar exposure at 21-24 weeks of age
- Meishan cross boars are lighter or smaller and higher libido and endurance
- Combination of fence exposure and boars inside the pens based on facilities / labor allocation
- Pheromones could be a resource if boar exposure is not possible
- Stocking density and facilities design are key to mitigate injuries

- **Heat Not Service**

- Track and record Heat Not Service age and weight in a record system
- If gilts are 280 Lb. of body weight at first heat recorded, they could be a candidate to be bred in the subsequent cycle
- Percentage of HNS recorded before 190 days of age it is a key driver to track

P1 Development:

Managing gilts bred over 350 Lb.



- **Do not limit feed intake prior first insemination**
 - Do not limit gilts feed intake to control growth and development prior first insemination
 - Maximize feed intake prior first insemination
- **Do not feed under maintenance during gestation**
 - Don't loose condition during gestation.
- **Increase feeding levels at/after second gestation (Heavier sows / Higher maintenance)**
 - Feeding level for P2+ and over-conditioned sows – 6.65 ME or 4.95 NE Mcal per day

P1 Development:

Managing Peripartum and Post Partum Sow Care



- **Pre farrowing preparation**
 - Control feeding pre partum – 2 or 3 rations per day (Same feed level than gestation)
 - Water nipple training and stand up twice a day (Peanut butter)
 - Special focus on gilts – place them together when loading farrowing rooms
 - Peripartum diets: industry starting moving that direction
- **Feed intake (Water intake) lactation first 5 days after farrowing**
 - Early identification of Non eaters and fever 24 hours
 - Control/Step feeding for the first 3-5 days max. Then full feed
 - Water flow and water accessibility – 2 L/min minimum

Thank You!

© Pig Improvement Company

