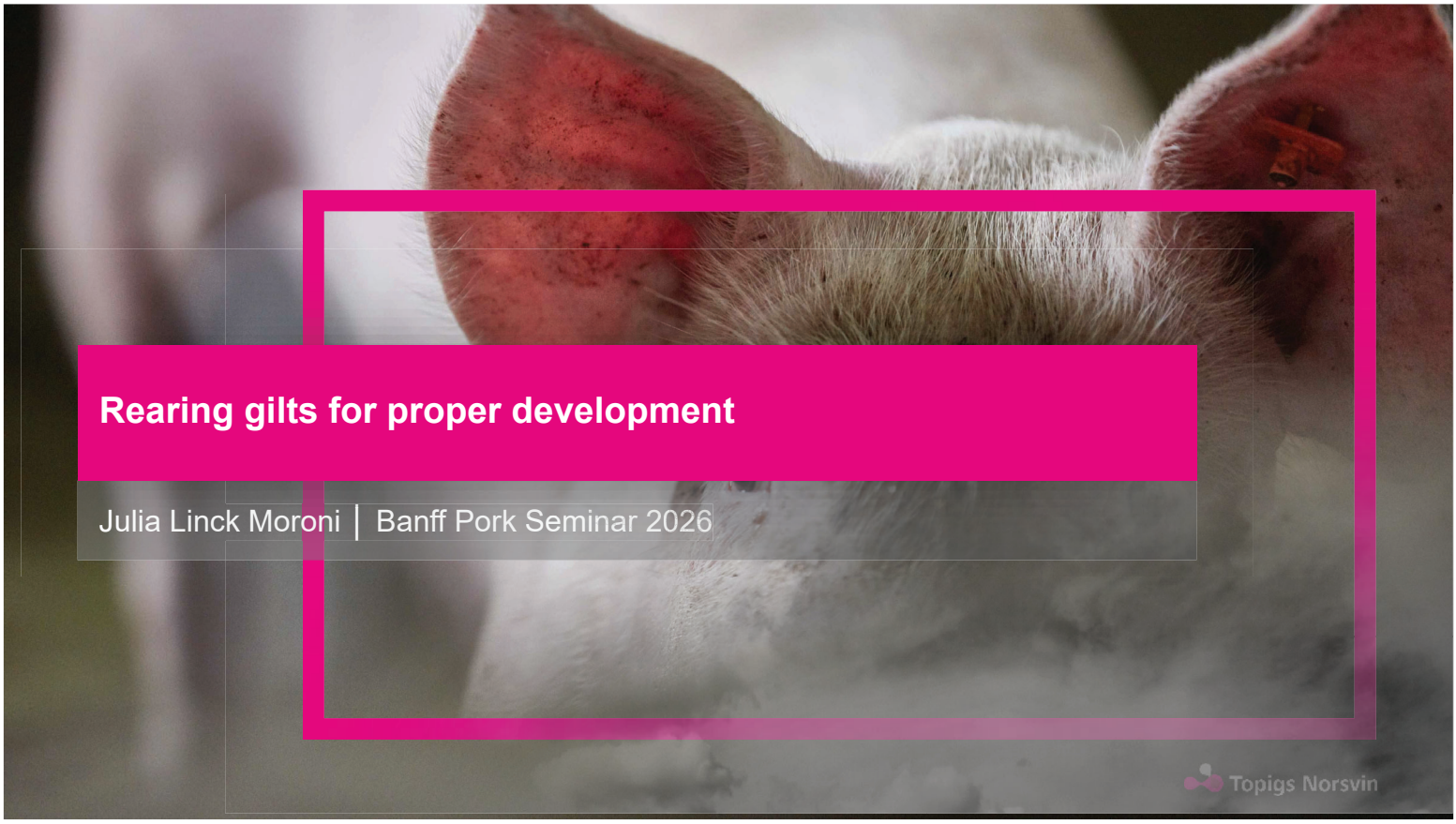
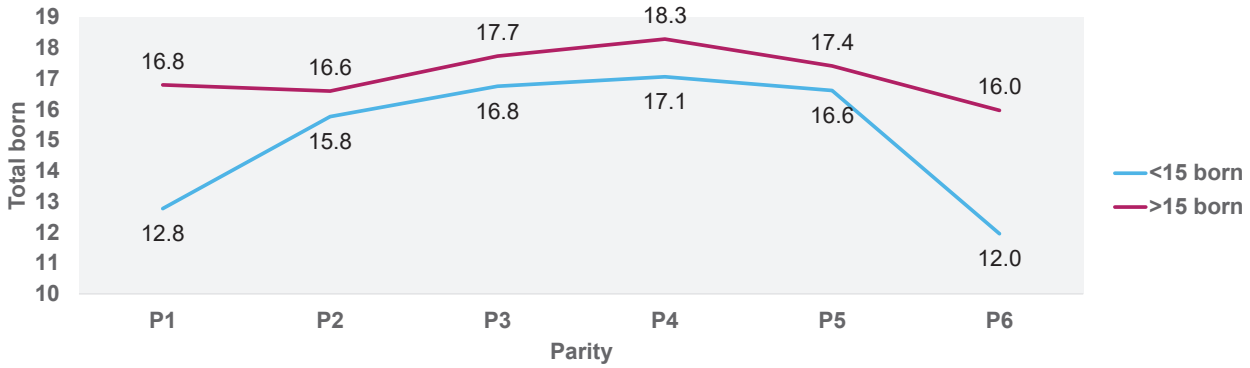



# Introduction

**Gilt development is a long-term commitment that encompasses structural soundness, the ability to support the litter during gestation and lactation, and the capacity to rebreed after weaning.**

Productivity in the first parity is known to influence lifetime performance



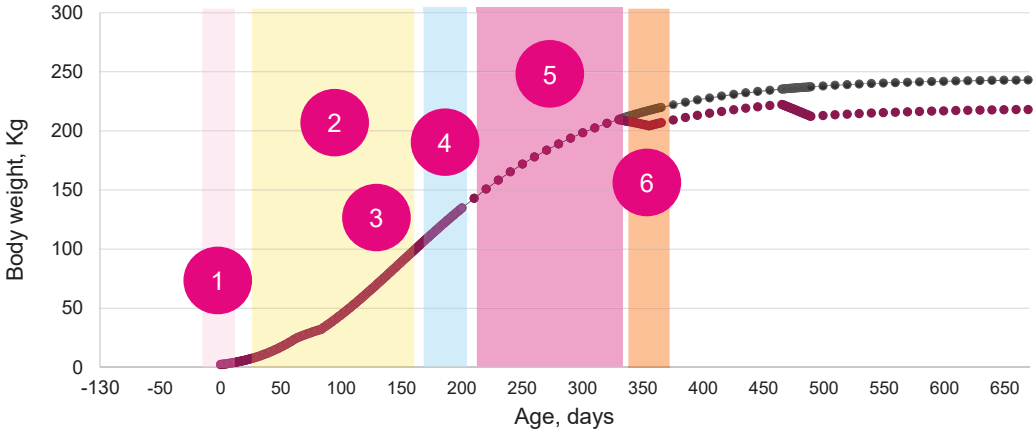



Topigs Norsvin internal data

Topigs Norsvin

# Introduction

**Gilt development is a long-term commitment that encompasses structural soundness, the ability to support the litter during gestation and lactation, and the capacity to rebreed after weaning.**




1. Birth weight
2. Rearing phase
3. Puberty
4. Breeding targets
5. Gestation development
6. Lactation losses



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## The genetic engine

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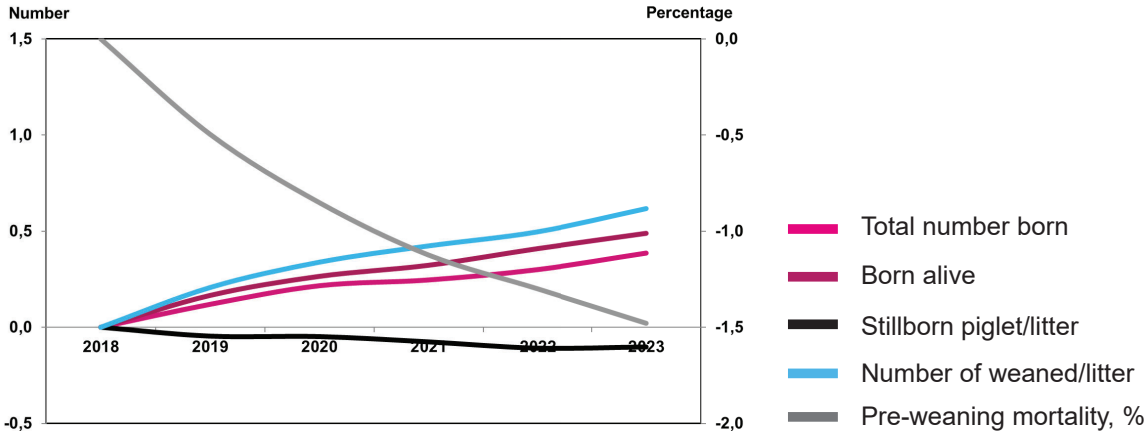
# The genetic engine

**Sow farm productivity is closely linked to the number of piglets weaned per litter, the number of non-productive days, and the longevity of breeding females within the herd.**



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# The genetic engine

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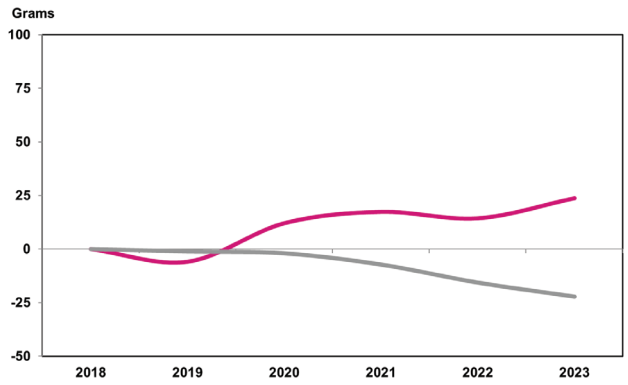


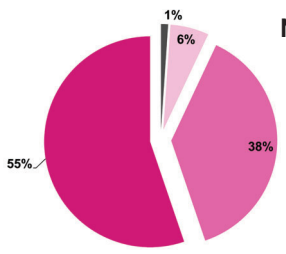


**Number of teats**

**16.8** teats on average

**93%** had at least **16 teats**

14 15 16 >16

Birth weight (gr/piglet) Litter variation (gr/piglet)



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# The genetic engine

In practice

## What does this mean?

- Higher parity 1 performance
- Higher birth weight and higher survivability
- More piglets weaned per litter
- More pressure on the sow and on milk production

**Gilt development is a critical aspect for successful gilt integration, maintaining a stable parity structure, and optimizing herd productivity and efficiency.**



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## Birth weight

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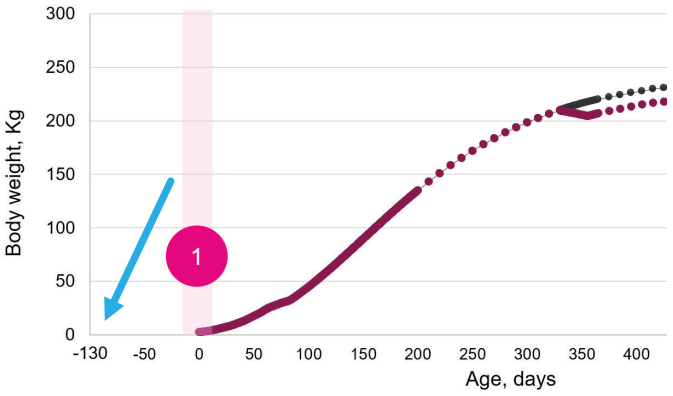
# Birth weight and reproductive efficiency




*Birth weight is also influenced by the management of the sow*

- Low birth weight gilts are a risk category
- Lower phenotypic survival
- Reduced average weight gain throughout all stages of production
- At risk of insufficient colostrum ingestion

**Minimum colostrum intake for future reproduction**

**Target:** 250 grams of colostrum



Oliviero et al., 2019; Devillers et al., 2011

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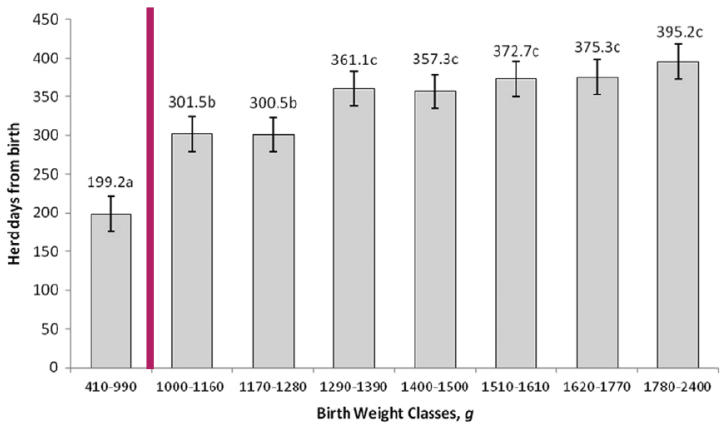
# Birth weight and reproductive efficiency

- The number of days a gilt remains in the herd is dependent on its birth weight

**Impact on retention rate**






Magnabosco et al., 2016

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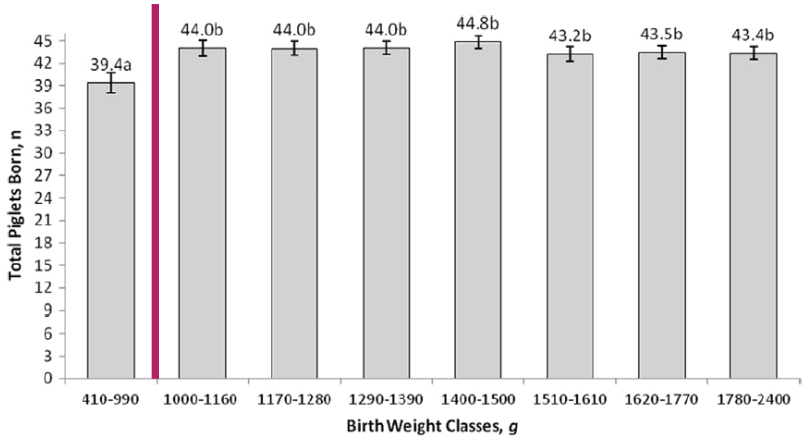
# Birth weight and reproductive efficiency

- Gilts with a birth weight higher than 1kg exhibit superior lifetime performance (total born across three parities)

**Impact on total born to parity 3**






Magnabosco et al., 2016

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## Rearing phase

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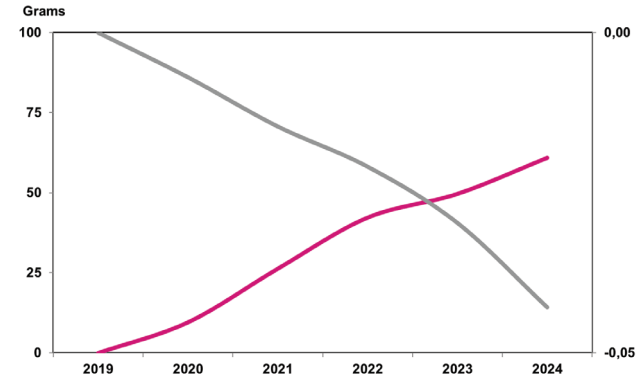
# Rearing phase

Body weight development and management

## Growth performance




**60 grams higher daily gain and 0.04 improvement in FCR over 5 years**

*Steady growth and development to promote longevity*

- Support life daily gain > 650 grams per day
- < 550g/day: impaired reproductive performance
- Continuous monitoring and adjustment of feeding strategies are essential
- Ca and P are crucial minerals for bone development and claw quality

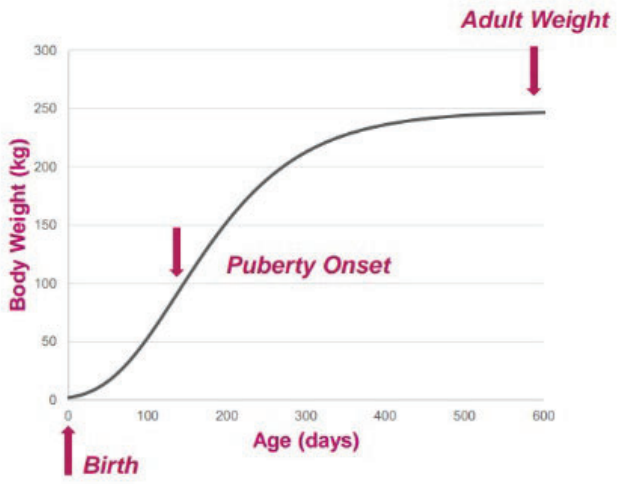


Patterson & Foxcroft, 2019



# Rearing phase

Puberty stimulation and identification




JOURNAL ARTICLE

**60 Whole genome prediction of the onset of puberty in a pig growth model based on body weight and feed intake data from boar stations using a Bayesian hierarchical model.** FREE

Rodrigo Mezencio Godinho, Haipeng Yu, Lisanne Verschuren, Egbert F Frank Knol, Rohan Fernando, Jack C M Dekkers, Eli Grindflek

*Journal of Animal Science*, Volume 103, Issue Supplement_3, October 2025, Page 315, https://doi.org/10.1093/jas/skaf300.366
**Published:** 04 October 2025

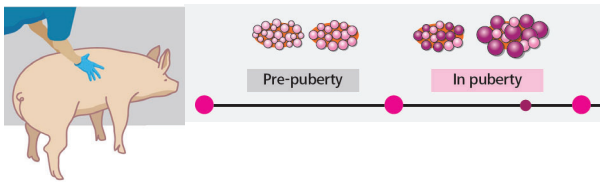
**What about gilts?**

# Rearing phase

Puberty stimulation and identification

***"Physiological age at breeding is the most important criteria for determining the time of mating, rather than chronological age"***

(Foxcroft G., Patterson J, 2010)




**The earlier gilts cycle**

↓

**More active reproductive tract**

- To breed gilts with **210 - 220 days** of age and **respect HNS**
- Puberty stimulation should start at **150 - 160 days of age**
- Daily boar exposure (direct contact)



# Rearing phase

Puberty stimulation and identification

## Puberty stimulation and identification

1. Identification of the most fertile gilts
2. Prevents delayed age at first mating
3. Decreases non-productive days

**First estrus expression after boar exposure**

**Target:** > 85% of gilts in heat in 30 days

## Impact of heat no service (HNS)

1. Positive impact on farrowing rate and total born on parity 1
2. Positive impact on retention rate to parity 3
3. Positive impact on pigs born to parity 3

**Respect the physiological age (HNS)**

**Target:** > 95% of gilts bred with 1 annotated HNS

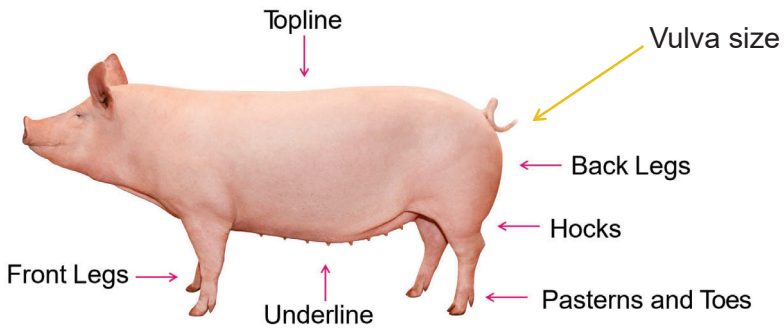


(Foxcroft G., Patterson J, 2010; Patterson and Pinilla 2020)

# Rearing phase

Gilt selection and structure

***Structure is the foundation for performance, welfare, reproduction success, and lifetime performance.***

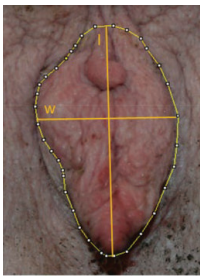





# Rearing phase

Gilt selection and structure: vulva size

**Is vulva size a predictor of fertility in gilts?**




- Vulva size measured by vulva length and width
- Measurements taken at two stages in the development of the gilts

150 days of age
n = 5770

At insemination
n = 680

- Impact on parity 1 performance
- Impact on lifetime performance
- Impact on artificial insemination technique: ability to pass the catheter

# Rearing phase

Gilt structure – vulva size

**Preliminary analysis: Correlation of vulva size traits with production on parity 1**

| Trait | VW_corr | VL_corr | VA_corr | NR_TOTAL_BORN | NR_LIVEBORN | AGE_TEND | STD_LIFETIME_DAILY_GAIN | WEIGHT_TSTART | WEIGHT_TEND | VULVA_WIDTH_MM | VULVA_LENGTH_MM | vulva_area |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VW_corr | 1.00 | 0.52 | 0.91 | -0.03 | -0.02 | 0.02 | 0.07 | 0.02 | 0.08 | 0.94 | 0.47 | 0.82 |
| VL_corr | 0.52 | 1.00 | 0.81 | 0.04 | 0.03 | 0.03 | 0.10 | 0.06 | 0.11 | 0.49 | 0.82 | 0.72 |
| VA_corr | 0.91 | 0.81 | 1.00 | 0.01 | 0.01 | 0.02 | 0.09 | 0.04 | 0.10 | 0.85 | 0.69 | 0.89 |
| NR_TOTAL_BORN | -0.03 | 0.04 | 0.01 | 1.00 | 0.89 | 0.05 | 0.02 | 0.09 | 0.03 | -0.03 | 0.04 | 0.01 |
| NR_LIVEBORN | -0.02 | 0.03 | 0.01 | 0.89 | 1.00 | 0.04 | -0.03 | 0.06 | -0.02 | -0.03 | 0.03 | 0.00 |
| AGE_TEND | 0.02 | 0.03 | 0.02 | 0.05 | 0.04 | 1.00 | -0.06 | 0.28 | 0.15 | 0.07 | 0.08 | 0.08 |
| STD_LIFETIME_DAILY_GAIN | 0.07 | 0.10 | 0.09 | 0.02 | -0.03 | -0.06 | 1.00 | 0.68 | 0.98 | 0.08 | 0.12 | 0.11 |
| WEIGHT_TSTART | 0.02 | 0.06 | 0.04 | 0.09 | 0.06 | 0.28 | 0.68 | 1.00 | 0.67 | 0.04 | 0.08 | 0.06 |
| WEIGHT_TEND | 0.08 | 0.11 | 0.10 | 0.03 | -0.02 | 0.15 | 0.98 | 0.67 | 1.00 | 0.10 | 0.14 | 0.13 |
| VULVA_WIDTH_MM | 0.94 | 0.49 | 0.85 | -0.03 | -0.03 | 0.07 | 0.08 | 0.04 | 0.10 | 1.00 | 0.59 | 0.91 |
| VULVA_LENGTH_MM | 0.47 | 0.82 | 0.69 | 0.04 | 0.03 | 0.08 | 0.12 | 0.08 | 0.14 | 0.59 | 1.00 | 0.86 |
| vulva_area | 0.82 | 0.72 | 0.89 | 0.01 | 0.00 | 0.08 | 0.11 | 0.06 | 0.13 | 0.91 | 0.86 | 1.00 |

| Trait | Total born | Born alive | Body weight |
|---|---|---|---|
| **Vulva width** | 0.03 | 0.02 | 0.08 |
| **Vulva length** | 0.04 | 0.03 | 0.11 |
| **Vulva area** | 0.01 | 0.01 | 0.10 |



Topigs Norsvin, unpublished data

Topigs Norsvin

# Rearing phase

Gilt structure – vulva size

**Preliminary analysis:**

- Vulva size is not correlated to production traits (total number born and born alive) on parity 1
- All gilts were successfully inseminated
- Analysis of subsequent performance will be performed
- Selection of replacement gilts based on the size of the vulva focusing on production is not currently advised



Topigs Norsvin, unpublished data

Topigs Norsvin

# Pre-breeding strategies and breeding targets

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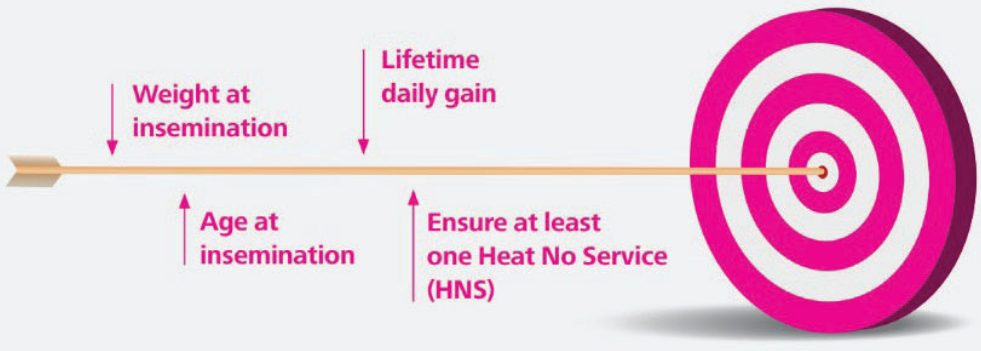
## Breeding targets



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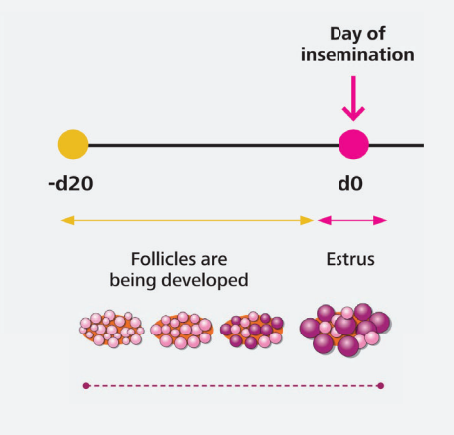
# Pre-breeding strategies

20 days before the insemination




- Any routine procedure that disrupts feed intake of gilts before insemination ***negatively impact ovarian quality.***
- Proper acclimation and crate breaking at least 14 days before the insemination
- Avoid any sources of stress



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# Pre-breeding strategies

20 days before the insemination

## Flushing

Increase energy and nutrient uptake

- Promote insulin secretion and progesterone clearance
- Stimulate GnRH release and LH pulses
- Improve ovarian activity and ovulation rate
- No “superovulation” effect

| | | |
|---|---|---|
| Gilts | Up to target weight and age | Improve ovulation rate and total born |
| | Over target weight and age | Improve ovulation rate but no improvement in total born |
| Breeding | In 2nd estrus | Improve ovulation rate and total born |
| | In 3rd or later estrus | Improve ovulation rate but no improvement in total born |

**M.B. Menegat 2021**
(presentation at ASAS MIDWEST 2021 - Nonruminant Nutrition Symposium II



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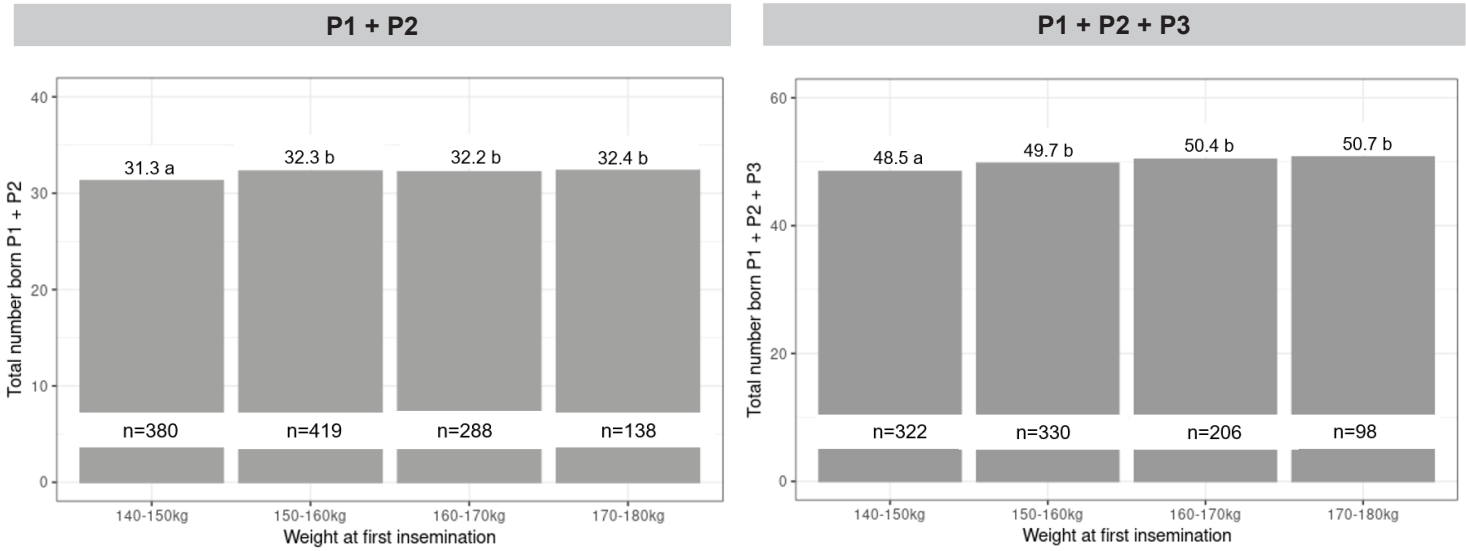
# Breeding targets

Cumulative performance = sum of TNB over parities

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## Body weight development during gestation

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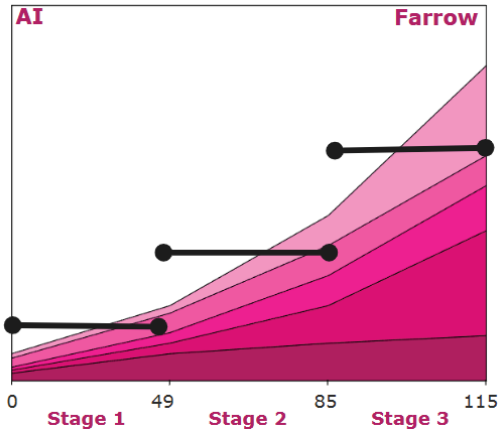
# Body weight development during gestation

- Weight gain during first gestation is important to prevent reproduction losses and enable young sows to continue to grow




**Maternal weight gain during gestation**

**Target:** 60 – 70 kg during the first gestation



*(Hoving et al., 2010)*

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# Body weight development during gestation

**Underdeveloped gilt**

- A less mature gilt arriving in farrowing
- Lower feed intake capacity during lactation

**Overdeveloped gilt**

- Higher maintenance
- Risk sow farrowing difficulties increasing chances of number stillborn
- Risk of a lame sow due to heavy weights
- Risk of feed refusal during lactation

Insufficient body reserves

High body weight loss during lactation



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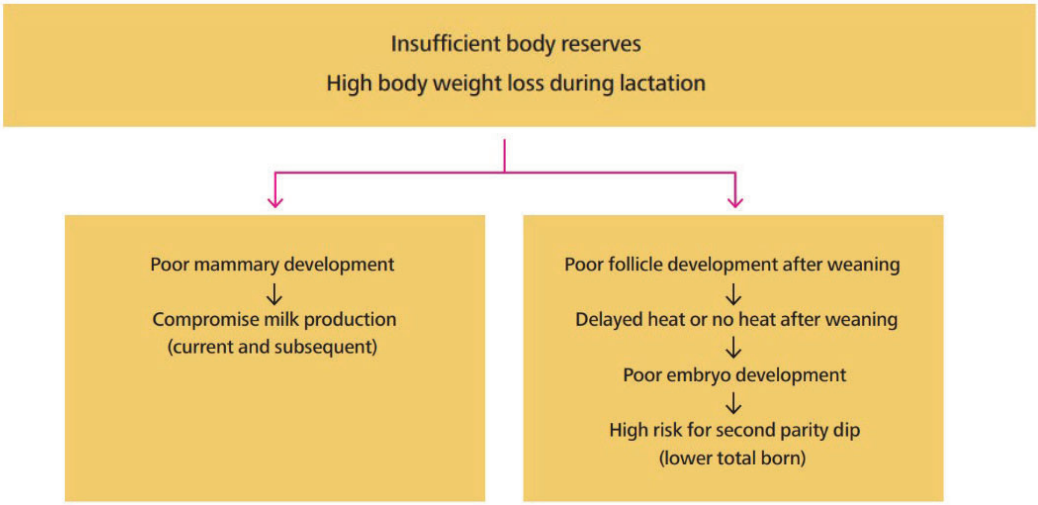
# Body weight loss during lactation

## Body weight loss during lactation and subsequent performance

- Lactation management of first parity sows starts with ensuring that sufficient body reserves are present at farrowing to support milk synthesis and mammary growth.



# Body weight loss during lactation and subsequent performance

Effect of relative weight loss (%) during the first lactation of TN70 sows on reproductive performance and litter characteristics in the second parity.

| | Weight loss | | | P-values[1] |
|---|---|---|---|---|
| | <6% | 6-12% | >12% | WL |
| **First parity** | | | | |
| Bodyweight gestation D107 (kg) | 235±1$^{a}$ | 238±1$^{a,b}$ | 245±1$^{b}$ | <0.01 |
| Back fat gestation D107 (mm) | 15.8±0.4$^{a}$ | 16.5±0.4$^{a,b}$ | 17.0±0.4$^{b}$ | <0.01 |
| Piglets weaned | 12.1±0.1$^{a}$ | 12.6±0.1$^{b}$ | 12.9±0.1$^{c}$ | <0.001 |
| Bodyweight loss parturition - weaning | 0.6±0.6$^{a}$ | 17.7±0.6$^{b}$ | 36.9±0.6$^{c}$ | <0.001 |
| Back fat loss gestation D107– weaning | 3.2±0.3$^{a}$ | 4.5±0.3$^{b}$ | 5.5±0.3$^{b}$ | <0.001 |
| **Second parity** | | | | |
| Weaning-to-insemination interval | 4.5±0.1$^{a}$ | 4.5±0.1$^{a}$ | 4.7±0.1$^{b}$ | 0.03 |
| Farrowing rate | 92.1±2.8 | 84.8±2.7 | 85.4±3.0 | 0.13 |
| Total number born | 15.6±0.3$^{a}$ | 14.6±0.3$^{a}$ | 13.2±0.3$^{b}$ | <0.001 |
| Number born alive | 14.9±0.3$^{a}$ | 13.9±0.3$^{a}$ | 12.7±0.3$^{b}$ | <0.001 |
| Number stillborn | 0.73±0.08 | 0.73±0.08 | 0.51±0.09 | 0.12 |



Costermans et al, 2019

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## Take home message

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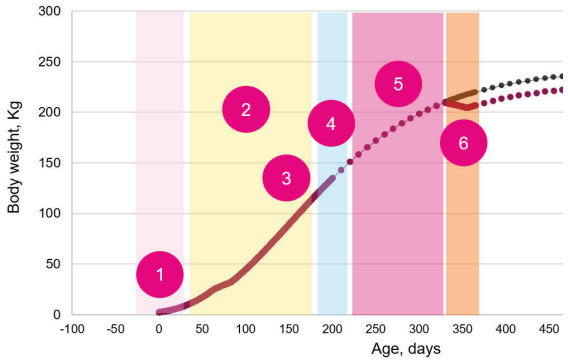
# Rearing gilts for proper development

## Take home message

**Gilt development is a long-term commitment that encompasses structural soundness, the ability to support the litter during gestation and lactation, and the capacity to rebreed after weaning.**

1. Select gilts with more than 1Kg at birth
2. Support life daily gain >650g/day
3. Start boar exposure with 150-160 days of age
4. Flush the gilts prior to the first insemination
5. Ensure 60 Kg of weight gain during the first gestation
6. Prevent >6% of weight loss during the first lactation



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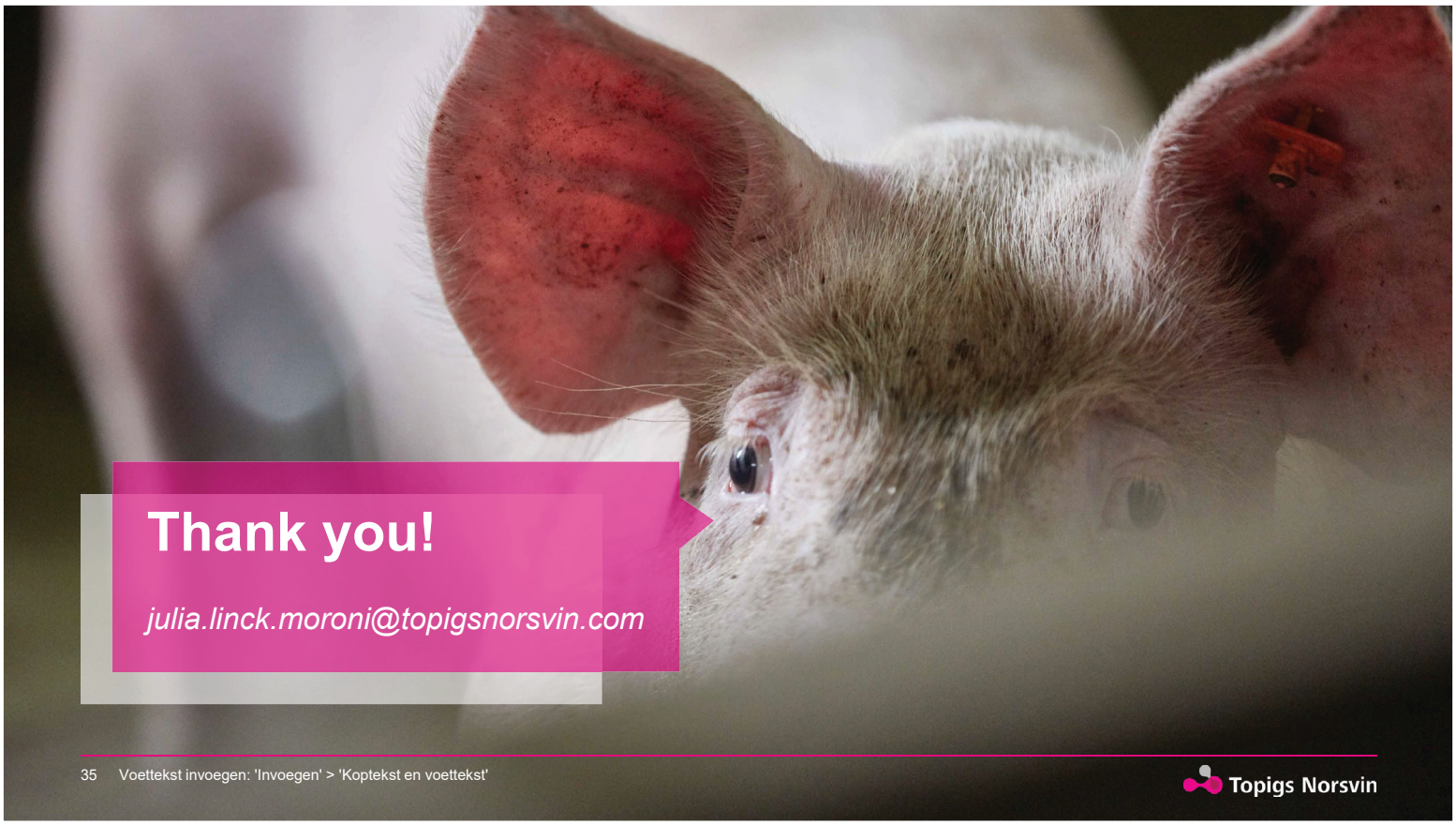

## Thank you!

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