SUCCESSFUL FEEDING STRATEGIES FOR GILTS AND LACTATING SOWS

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Svinekongres
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Agenda

- Feeding strategies for gilts
- Conditions for successful feeding of lactating sows
- Feeding strategies for sows – protein and amino acids
- Feeding strategies for sows – daily requirement
- Feeding strategies for sows – feeding curves

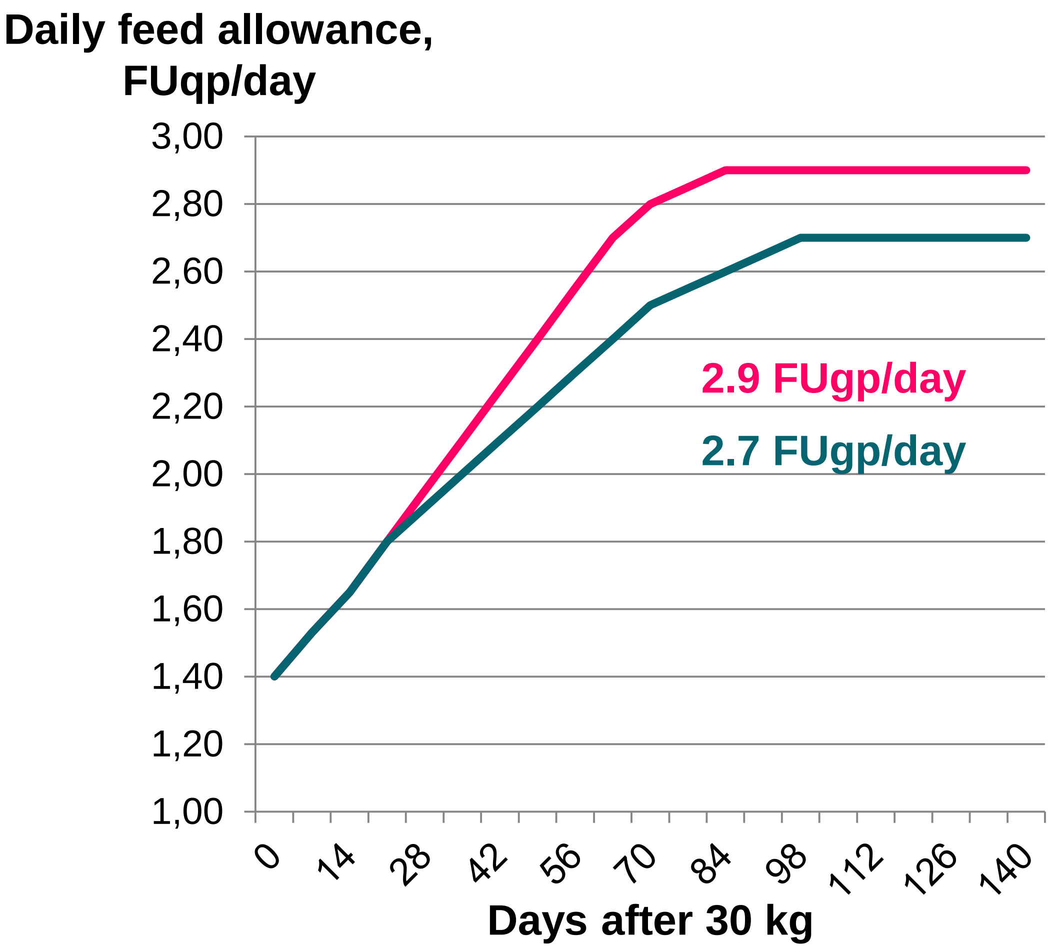
Feeding strategies for gilts

- maximise litter size in the first parity

Take home messages

Feeding of gilts from 30 kg until start of flushing

- Restrictive feeding according to the 2.9 FUgp feeding curve ensures breeding gilts with the right body condition
  - >12 mm backfat thickness at mating
- Use a diet with a moderate protein content to achieve a slightly slower growth rate
  - 6.0 g digestible lysine/100 g digestible protein per FUgp
- Reduce the proportion of fine particles in the diet to avoid gastric ulcers
  - Particle size: maximum 50% < 1 mm
- Ensure 2-3 daily feedings rather than ad-libitum feeding
- Register first estrus – breed in second estrus



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Flushing of gilts prior to breeding in second estrus

Flushing was +1.0 FUsow per day

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Flushing of gilts prior to breeding in second estrus
Reproduction results

Group	Low-Low	High-High	High-Low	Low-High
Flushing period, days	0	25	18	7
Farrowings, n	506	507	478	500
Farrowing rate, %	95.0	94.2	95.6	94.0
Totalborn piglets per litter	**15,9[a]**	16,1[a]	16,0[a]	**16,3[b]**

[a, b] Within a row, values without a common superscript letter differ ($P < 0.05$) from group 1

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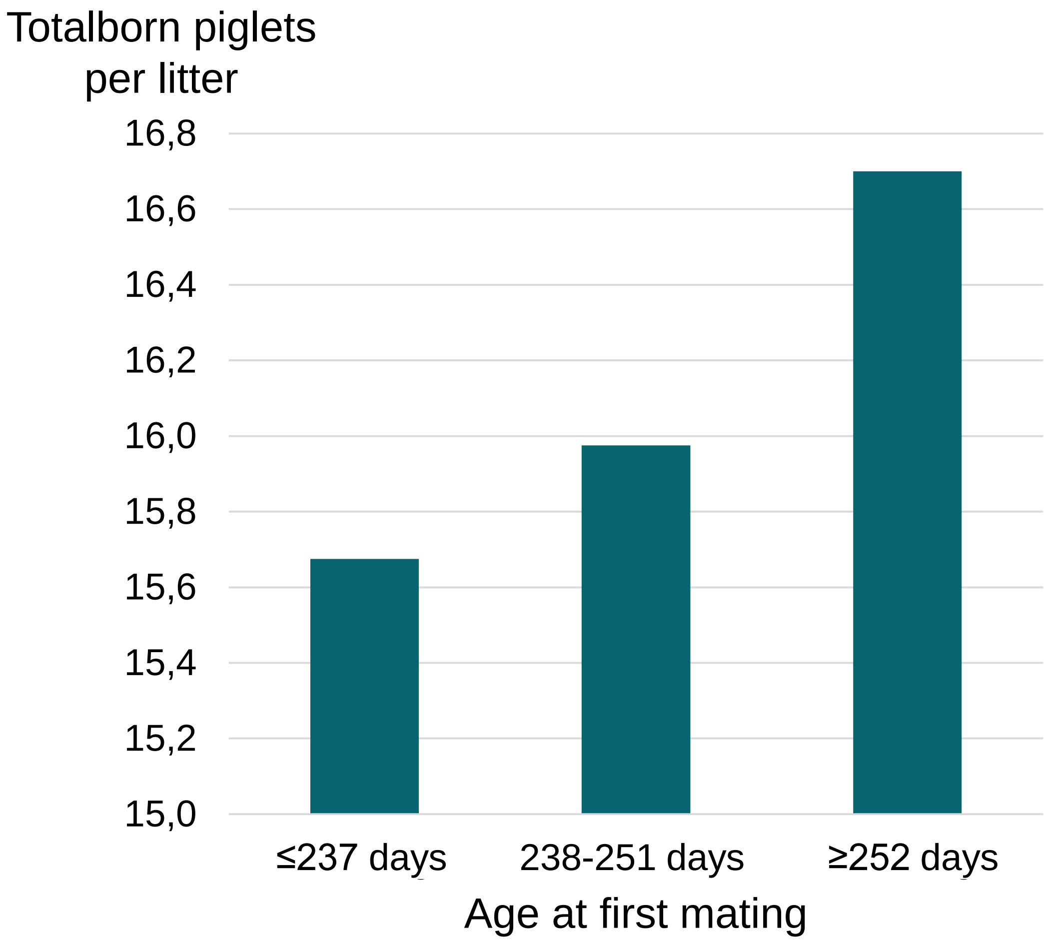
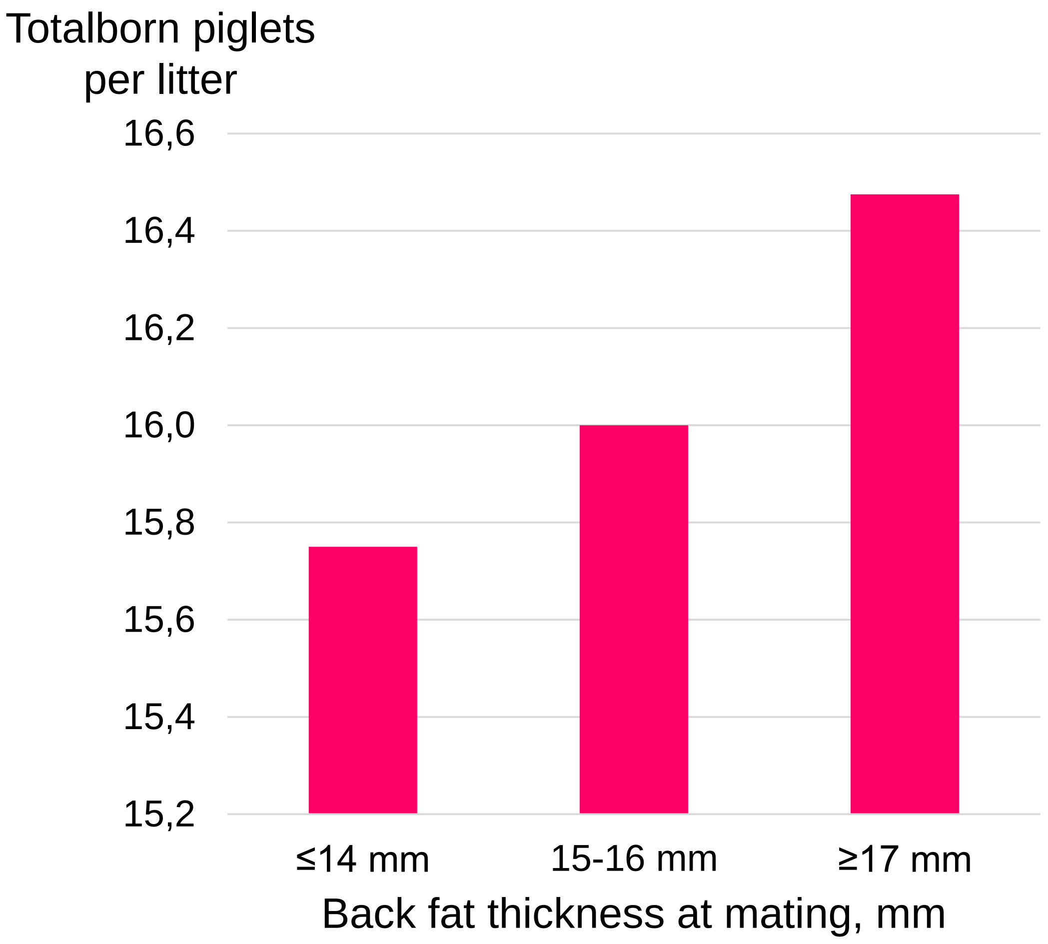
Flushing of gilts prior to breeding in second estrus
Backfat thickness and age are important





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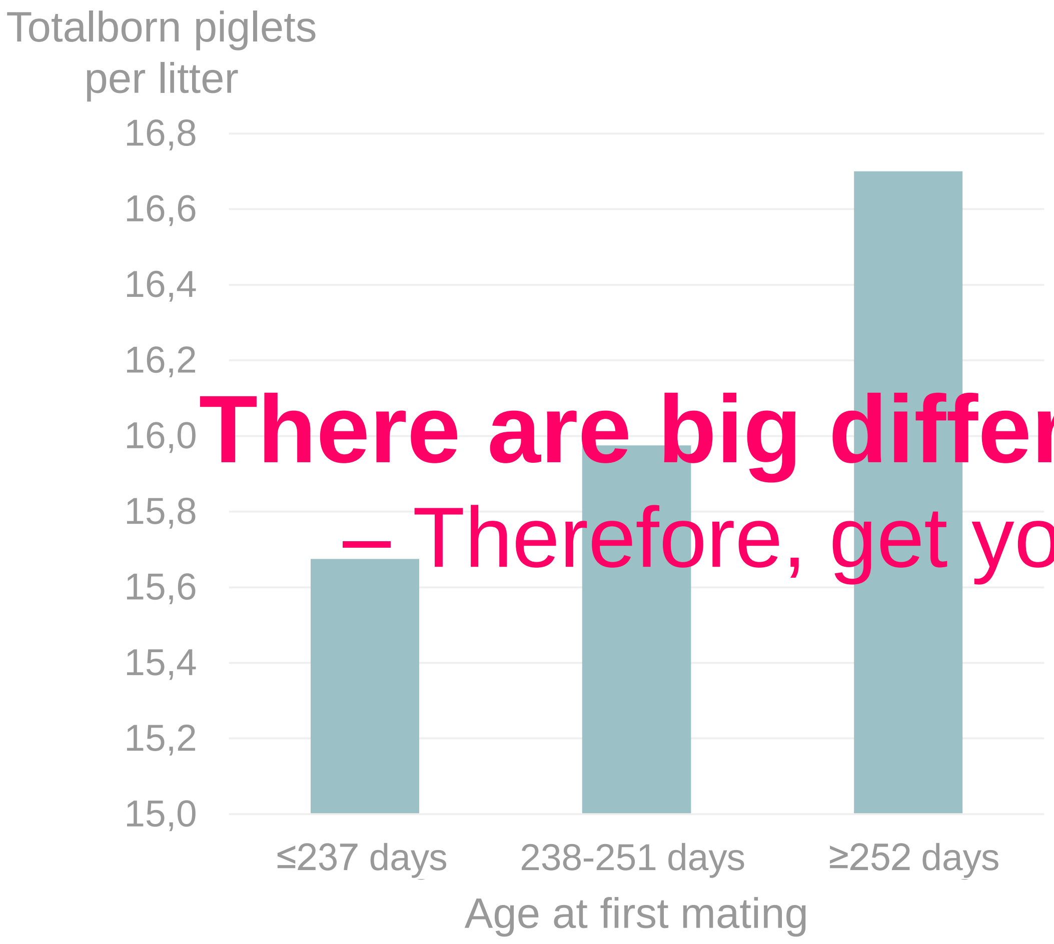

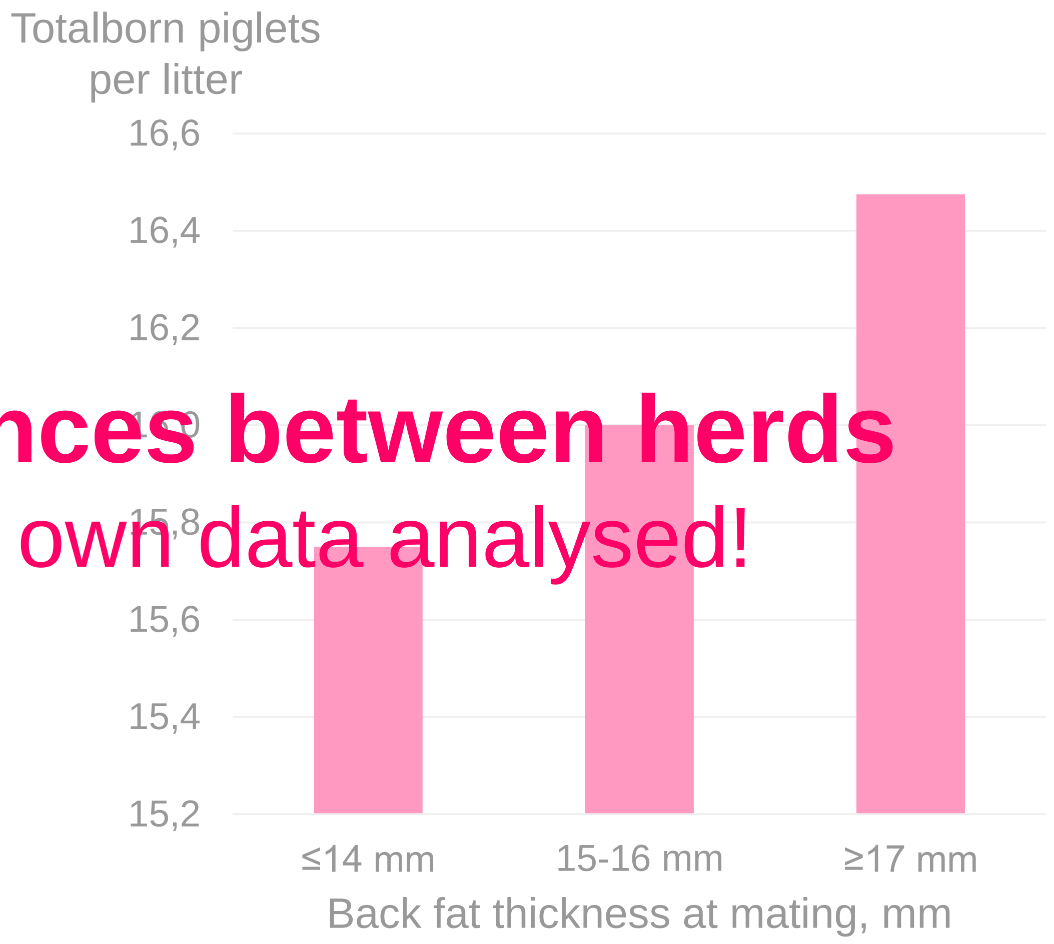

There are big differences between herds

– Therefore, get your own data analysed!

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Get the most benefit from flushing
Stop flushing right after mating of the gilt

Why?

- High feed allowance from mating and 5 days ahead counteract the effect of flushing prior to mating
  - Loss of fetuses (Jindal et al. 1996; Langendijk, 2015)

Challenge

- Large variability in the timing of first estrus of gilts within a pen

Solutions

- Synchronisation of estrus in gilts may reduce the variability
  - You cannot avoid ± 3 days in timing of estrus
- Use of individual pens from 5-7 days prior to expected estrus
  - Legislation: Only possible in some stables

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Example of gilt replacement flow to minimise variability

Reduction in pen size and number of gilts per pen

Gilt rearing
8-10 gilts per pen

→

Entry of gilts to mating section
8-10 gilts per pen

→

Cyclic gilts
4-5 gilts per pen
(gilts that became cyclic first)

Cyclic gilts
4-5 gilts per pen
(gilts that became cyclic last)

Take home messages
Successful feeding of gilts

- Use flushing 7 dage prior to expected mating of gilts
  - 2,9 FUgp/day ⇨ 3,5 FUsow/day (or more)
- Lower the daily feed allowance right after mating and at least 5 days ahead
  - 2,2-2,4 FUsow/day
  - Flushing may <u>only</u> appear prior to mating, otherwise totalborn piglets may be reduced
- Think strategically to ensure an optimal flow of gilts to minimise variability in time of estrus within a pen

Conditions

- for successful feeding of lactating sows

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Take home messages
Conditions for successful feeding

- Transfer of the sows to the farrowing stable minimum 3 days prior to the expected farrowing
- The right body condition: 16-19 mm backfat
- 3.5 FUsow per day until the end of farrowing
  - 3.0 FUsow at the day of farrowing when problems with MMA
- 3-4 daily feedings is recommended
  - The energy status of the sow throughout the day is improved
- Sows with healthy stomachs
- Fiber sources (i.e. 2-3% sugar beet pulp) in the lactation diet
- Water: 4 L/minute per drinking nipple

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Feeding of lactating sows

- protein and amino acids

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Lysine for lactating sows
Background

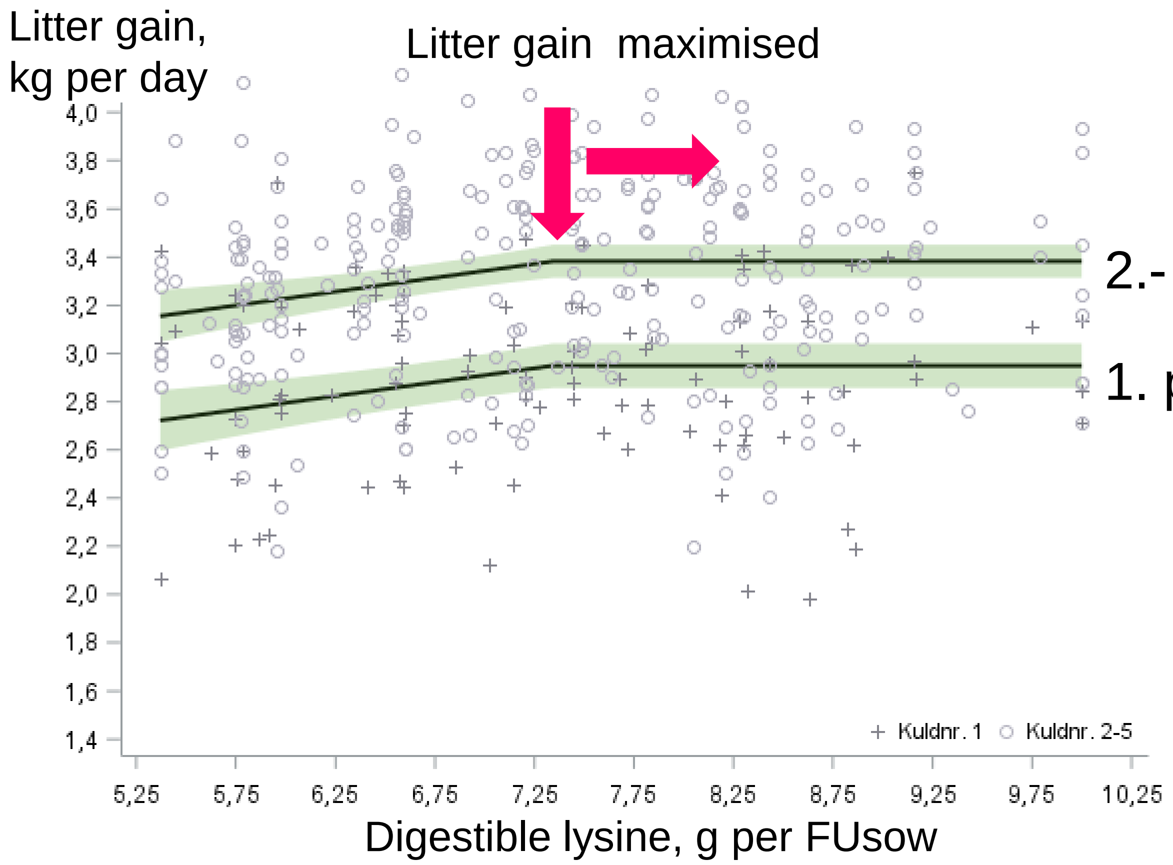
- In the Danish recommendations, the amino acid supply is given in terms of their ratios to lysine
- If lysine is <u>not</u> supplied at an adequate level relative to the other amino acids
  - The sow will not be able to utilise the other amino acids
  - The relative excess of these other amino acids will be catabolized and excreted as urea in the urine
  - The feed efficiency is decreased
  - Milk yield will be compromised

Lysine for lactating sows
Aim

- The aim was to ensure that the Danish recommendation of 7.7 g digestible lysine per FUsow was adequate for the sow to utilise the other amino acids
  - Are we able to ”squeeze” more milk out of the sows by increasing the supply of lysine?
  - Confirm or “kill” the myth that extra added lysine is beneficial for litter growth

Lysine for lactating sows
Result – litter gain

- Litter gain was maximised at 7.3-7.6 g digestible lysine per FUsow



2.- 5. parity sows: 3.4 kg/day

1. parity sows: 2.9 kg/day

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Lysine for lactating sows
Conclusion

- The myth that extra added lysine is beneficial for litter growth was "killed"
- The Danish recommendations for protein and amino acids remained unchanged

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Lysine for lactating sows

Results from my PhD-trial

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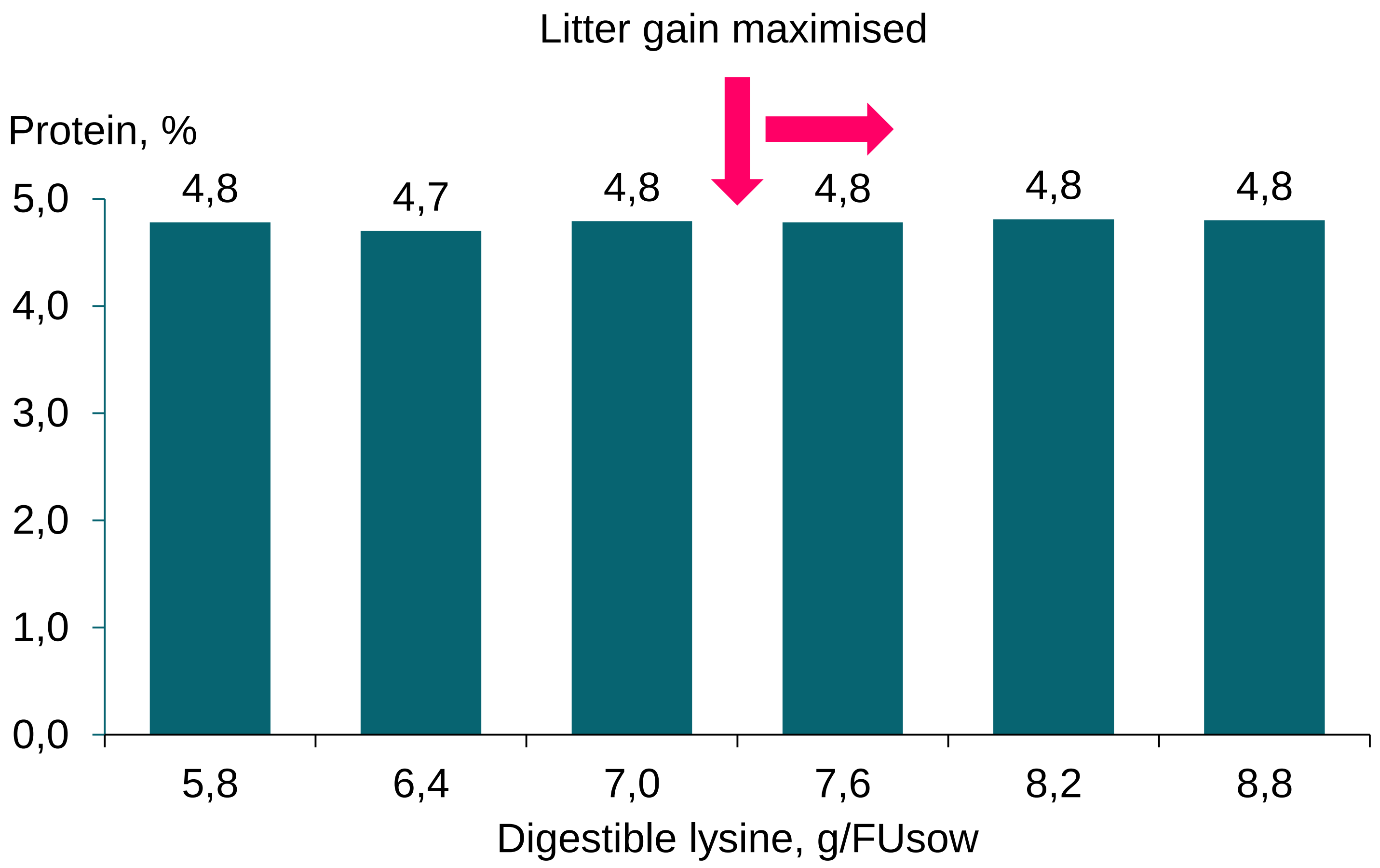
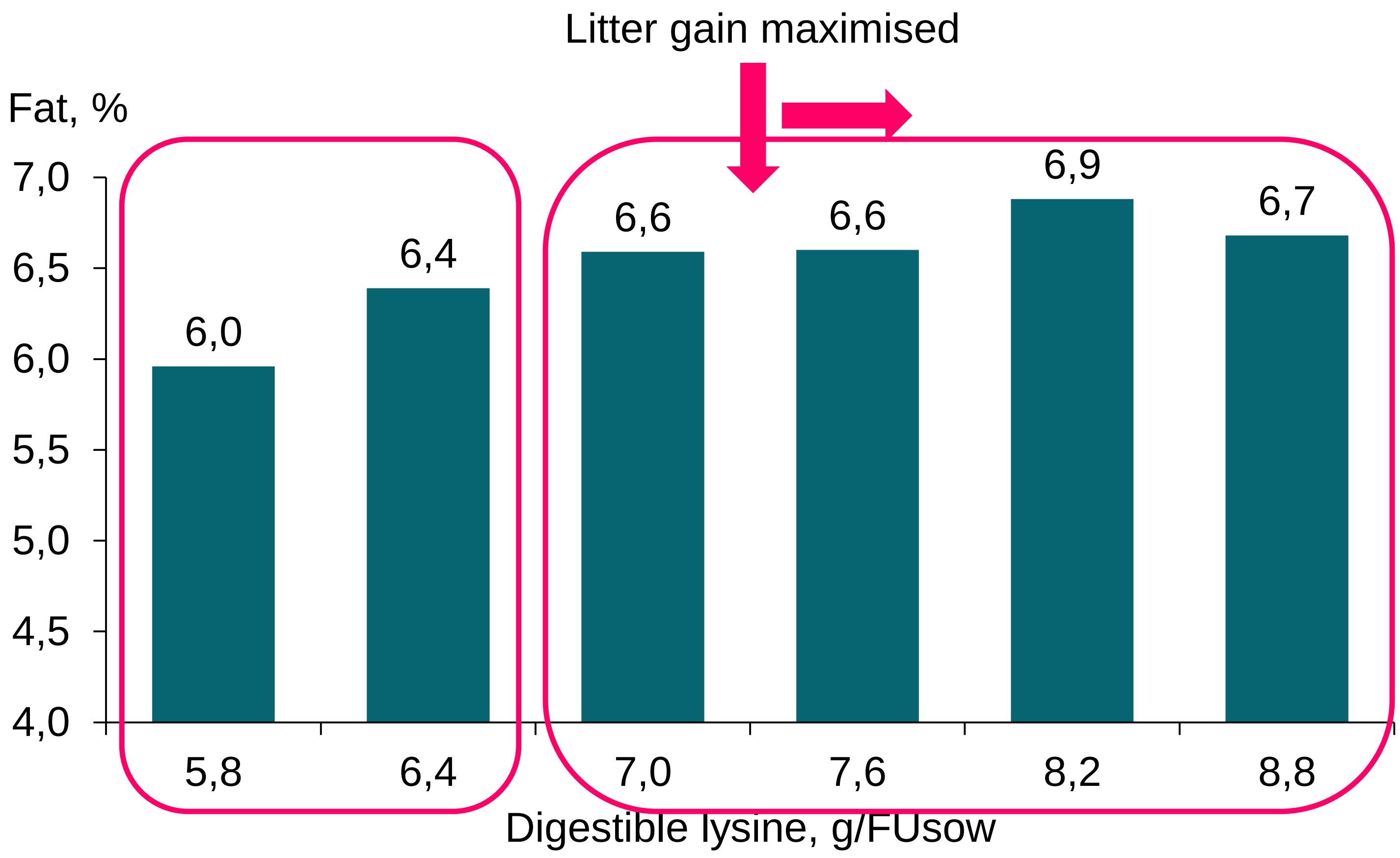
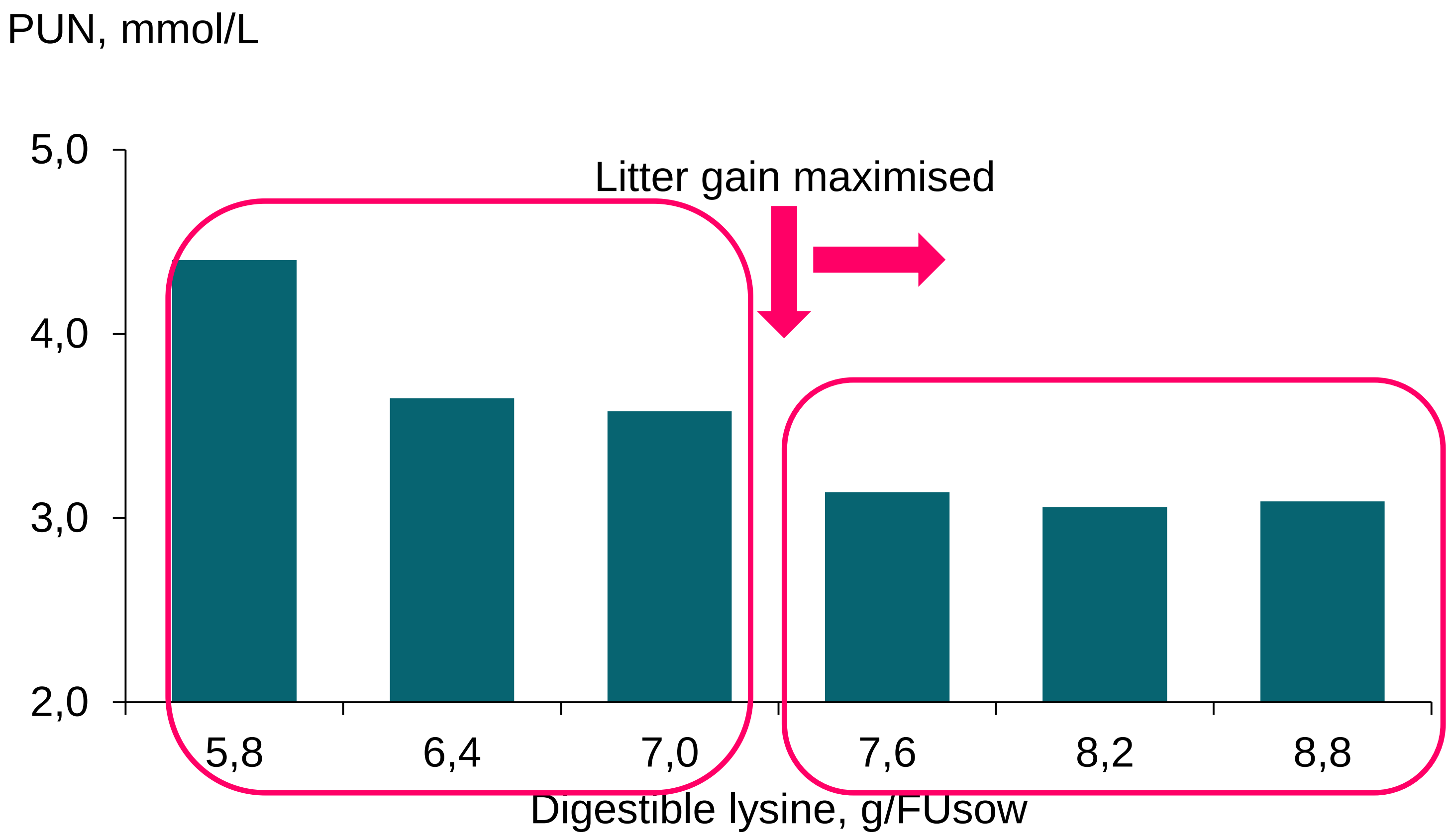
Lysine for lactating sows
Milk protein



Lysine for lactating sows
Milk fat



Lysine for lactating sows
Plasma urea nitrogen



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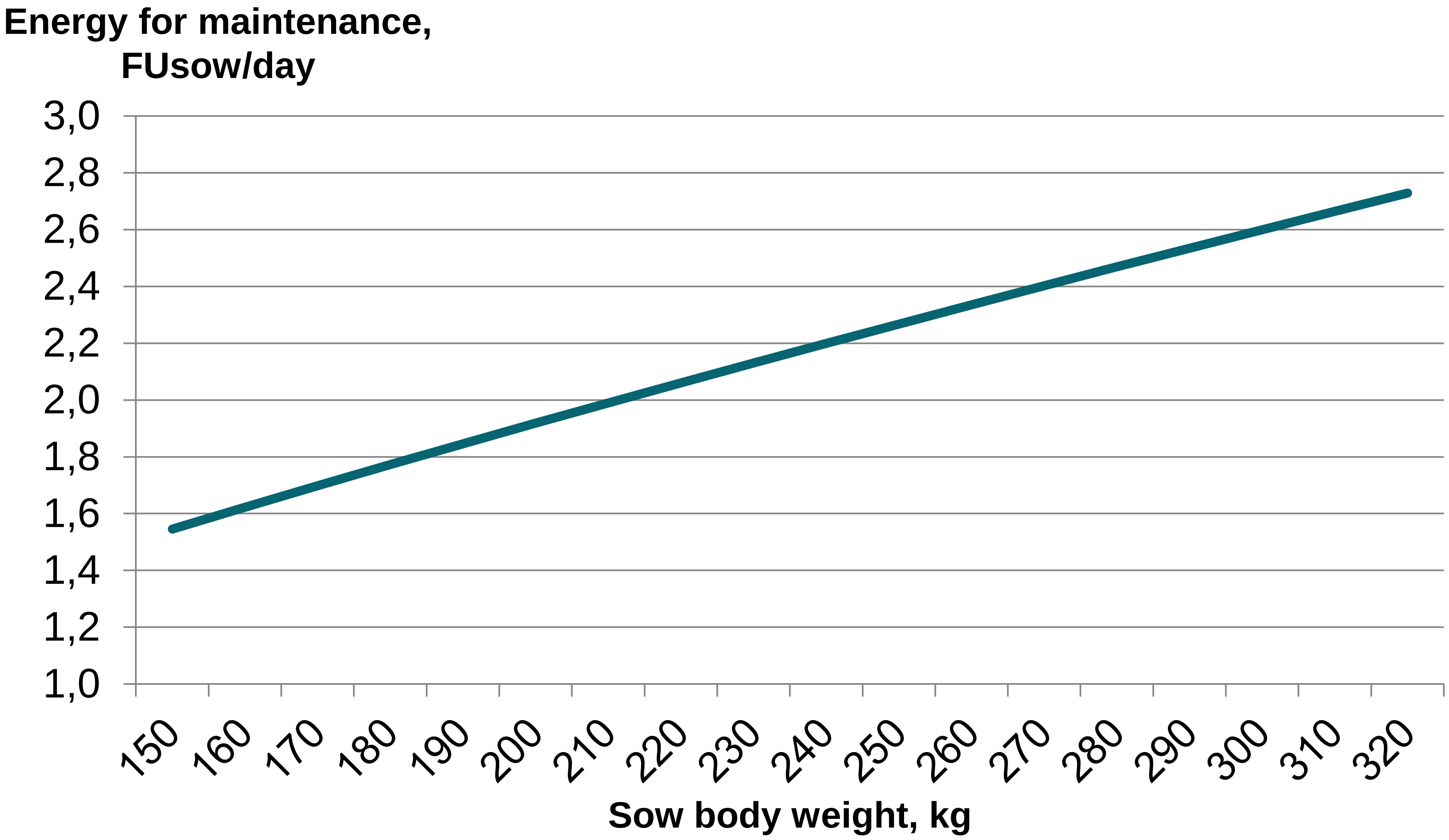
Take home messages
Lysine for lactating sows

- Do your sows a favour and make sure that <u>all</u> amino acids comply with the Danish recommendations
  - If all amino acids are fed in adequate amounts, the protein level is not a concern
  - <u>The amino acid profile</u> is important to follow – also if you choose to deviate in lysine level
- Liquid feeding: There is a risk of loss of lysine and threonine in the pipeline
  - Does only apply to normal liquid feeding system, <u>not</u> to residual free liquid feeding
  - Loss → less dietary lysine and threonine available for the sow → reduced litter gain
  - In standard commercially available diets, this is not taken into consideration
  - Use a specially formulated diet for liquid feeding

Feeding of lactating sows

- daily requirement

How much energy does the sow require for maintenance?
Depends on sow body weight and age



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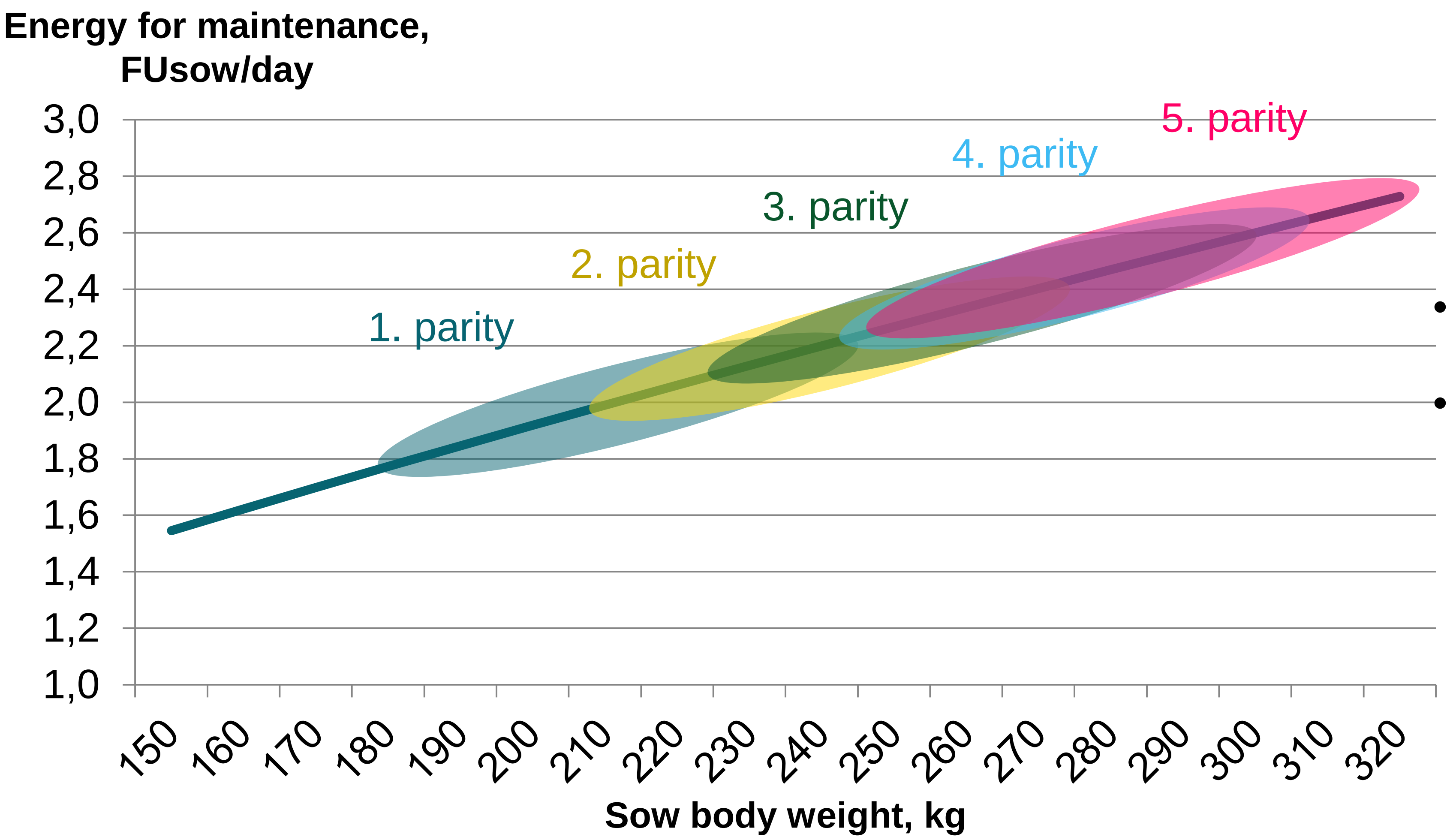

- 1.8-2.8 FUsow/day
- + 25 kg sow → + 0.2 FUsow/day

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Amino acid requirement for maintenance
Small amount of the daily supply

- During lactation, the daily requirement of amino acids for maintenance is rather low
  - It only accounts for maximum 5% of the total amino acid requirement for maintenance and milk production
  - Lysine requirement for maintenance ~ 2.0 g digestible per day

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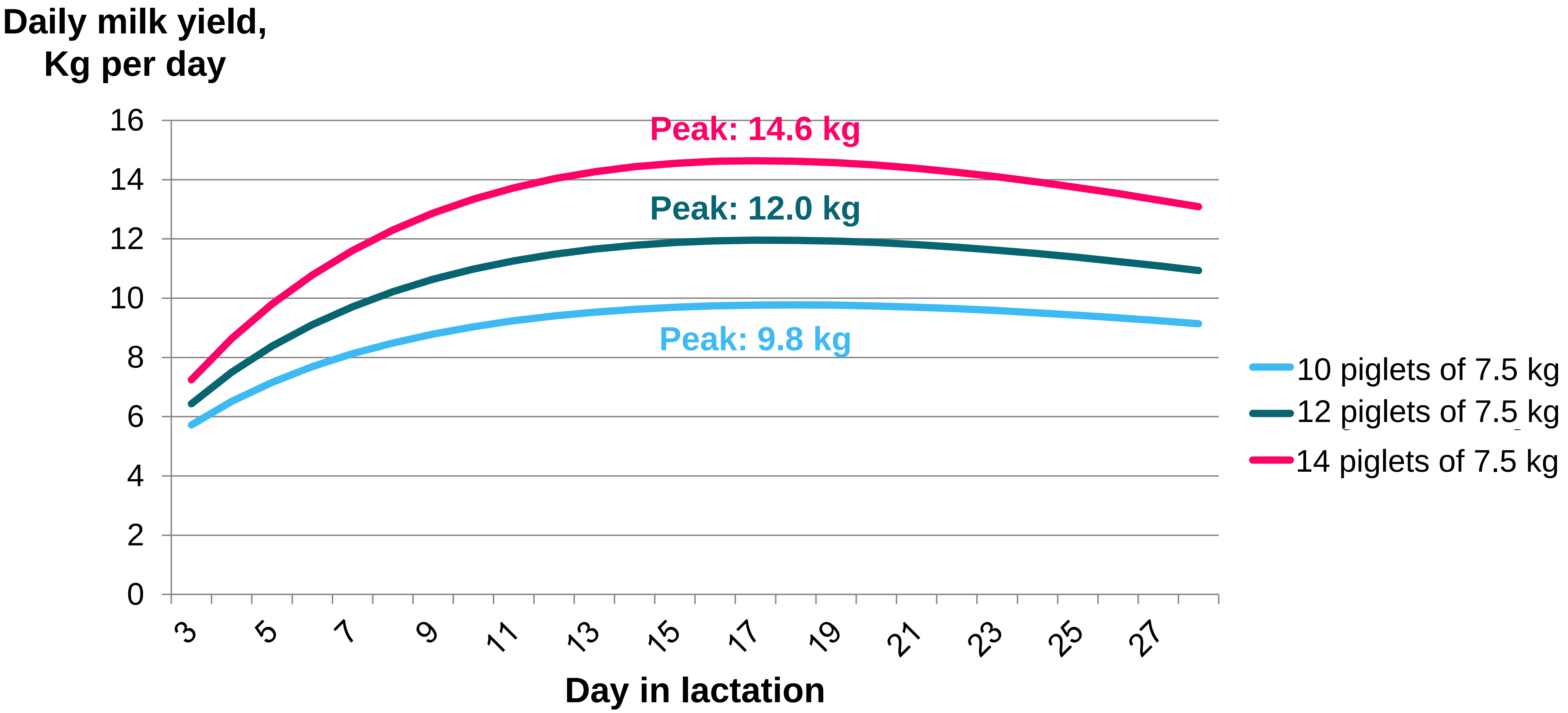
The milk yield determines the daily requirement
Highly dependent on litter size



AV Hansen, AB Strathe, E Kebreab, J France and PK Theil (2012): Predicting milk yield and composition in lactating sows - A Bayesian approach. *Journal of Animal Science.*

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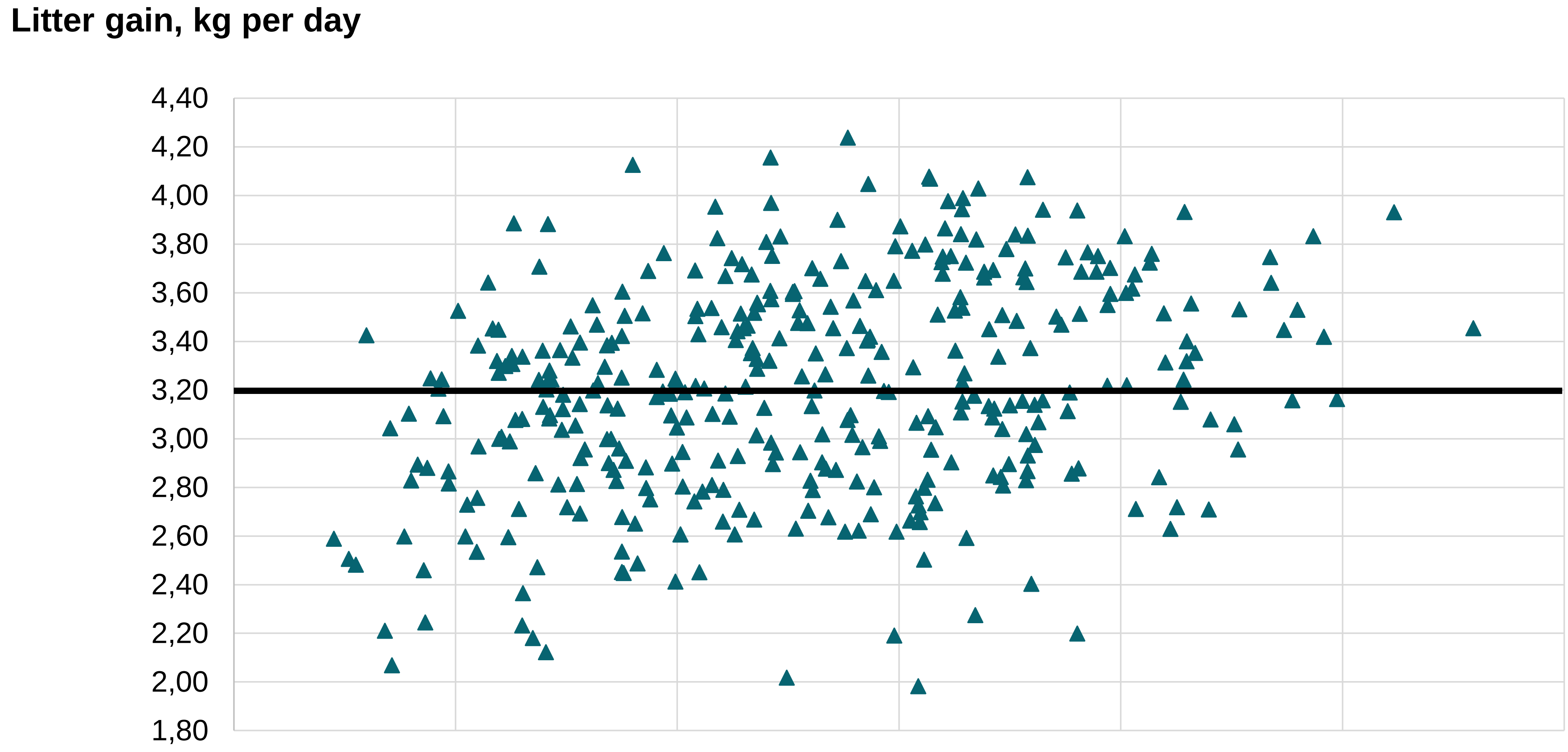
Variation in average daily litter gain within a herd

380 1st to 5th parity sows from a high productive herd



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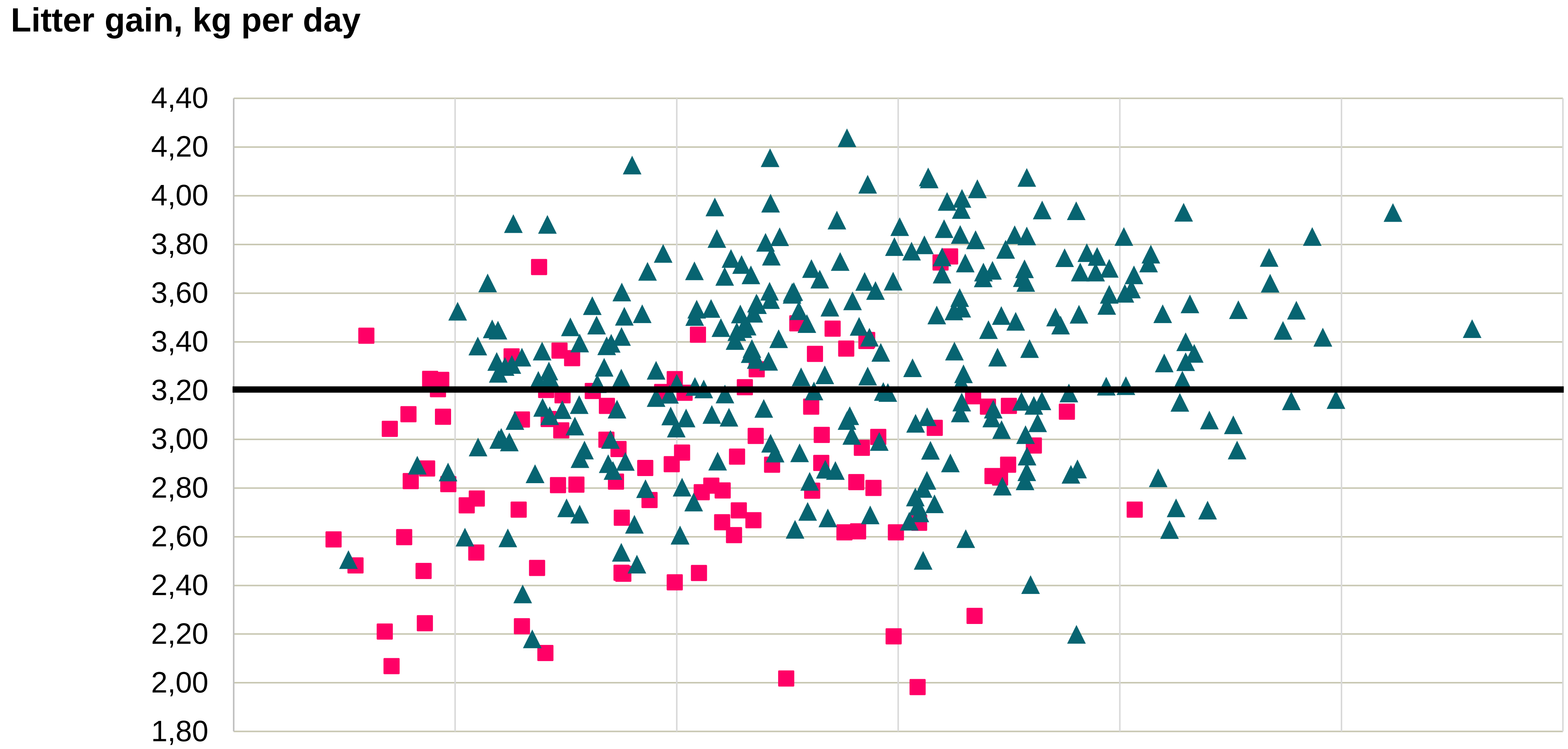
Variation in average daily litter gain within a herd

Divided into 1st parity (■) and 2nd to 5th parity sows (▲)



Know the litter gain in your herd

Measure weight of 20-30 litters every third month

Equation for daily litter gain, kg/d:

$$\frac{\text{Litter weight at weaning} + \text{weight of dead and removed piglets} - \text{Litter weight at equalization}}{\text{number of days from equalization to weaning}}$$

Take home messages
The sow's daily requirement

- Litter gain (milk yield) determines the daily requirement of energy and nutrients for the lactating sow
- First parity sows often have a lower litter gain (and feed intake) than older sows
  - However, no rule without exceptions
- Know the litter gain and feed intake of your herd
  - The combination between these two factors decide how much body weight your sows loose or gain

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Feeding of lactating sows

- feeding curves

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Feeding curve in early lactation
Highly debated throughout the last couple of years

- Do we need to increase the feed allowance the first 5-10 days of lactation?

- Pros
  - Lower BW loss of the sow
  - Higher litter gain/piglet weaning weight
  - Sows nurse more piglets

- Cons
  - Greater risk of sows dropping in feed intake later in lactation

Feeding curve in early lactation
Results

- Trial with two group of sows
  - Normal feeding curve
  - High feeding curve

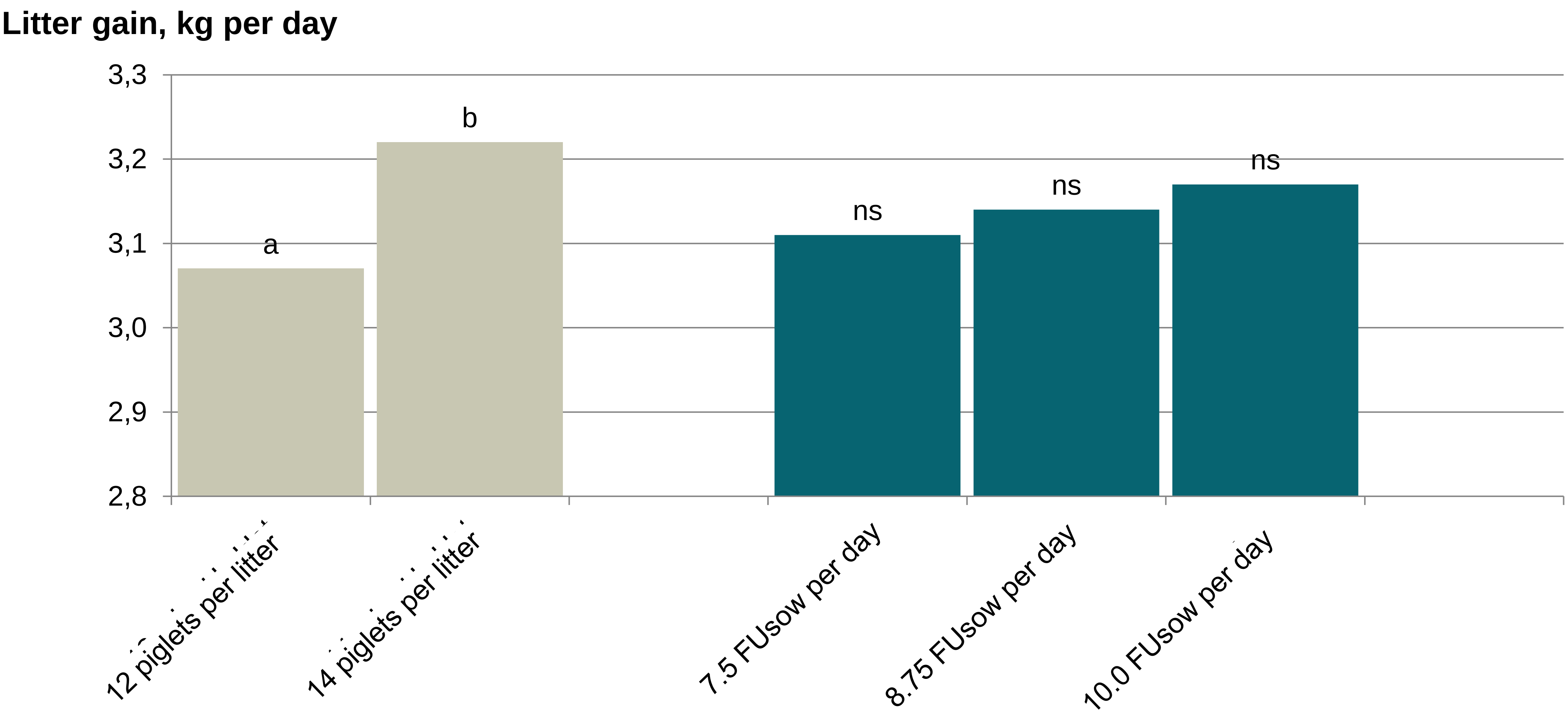
- High feeding curve
  - + 1 FUsow per day, day 0-14 in lactation
  - From day 14 in lactation: no difference

Feed allowance	Low	High
Litter size at standardisation	14	14
Litter weight day 14	57,2	57,5
Weaned piglets per litter	13,1	12,9
Sow BW loss, kg	$4{,}57^{ns}$	$4{,}34^{ns}$
Backfat loss, mm	$2{,}93^{b}$	$2{,}41^{b}$
Piglets weaning weight, kg	$7{,}31^{ns}$	$7{,}36^{ns}$
Litter gain, kg per day	$3{,}12^{ns}$	$3{,}07^{ns}$

Take home messages
Feeding curve in early lactation

- In herds struggling with high body weight - and backfat losses
  - The effect of a higher feeding curve is expected to be greater
  - Perhaps improved results in the subsequent reproduction
- No reason to stop good experiences
  - However, experiences must be quantified – not guessing
  - A higher piglet weaning weight must pay for the extra feed

Feeding curve in late lactation
Little possibility to affect the daily litter gain



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Feeding curve in late lactation
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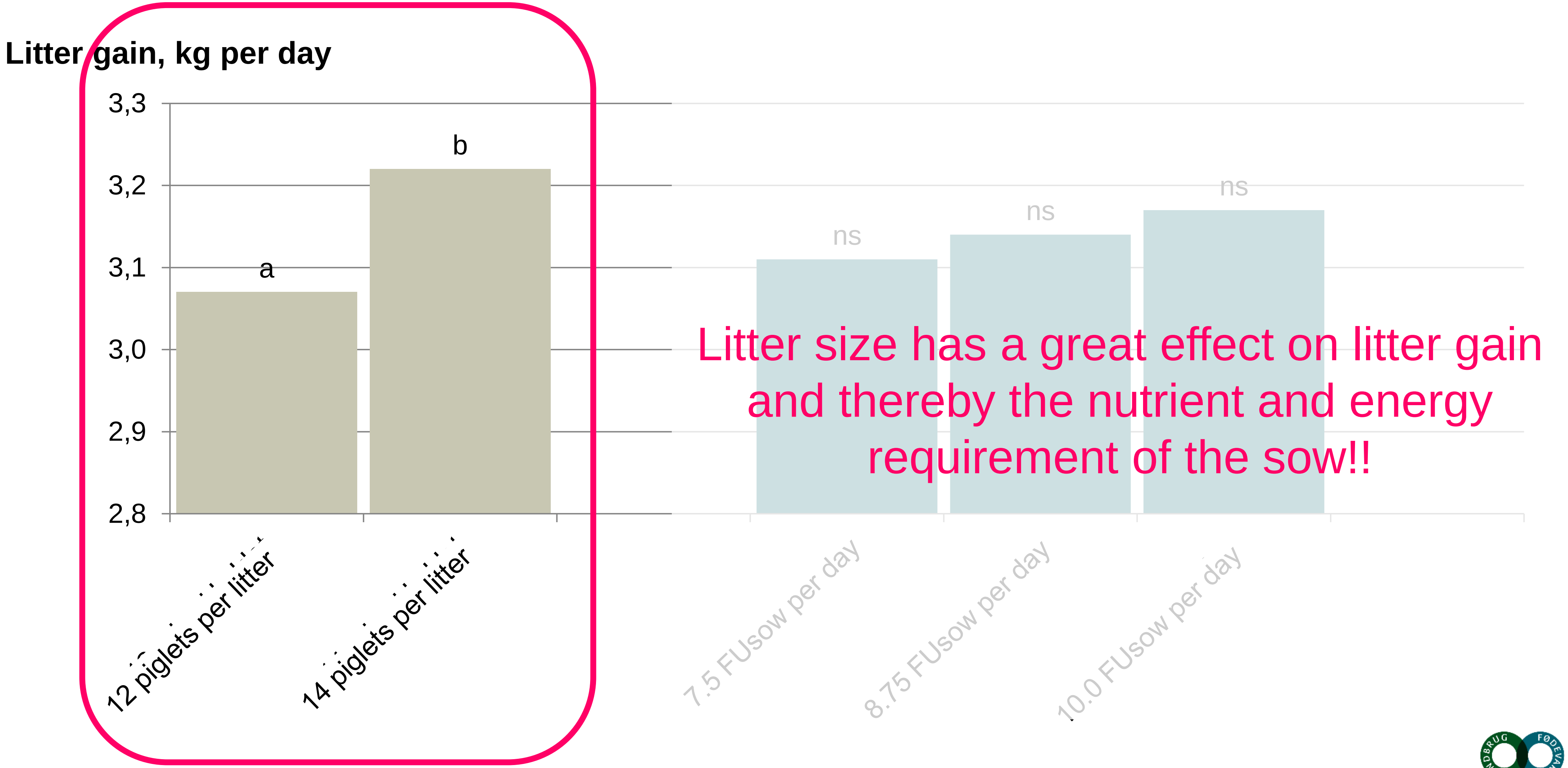

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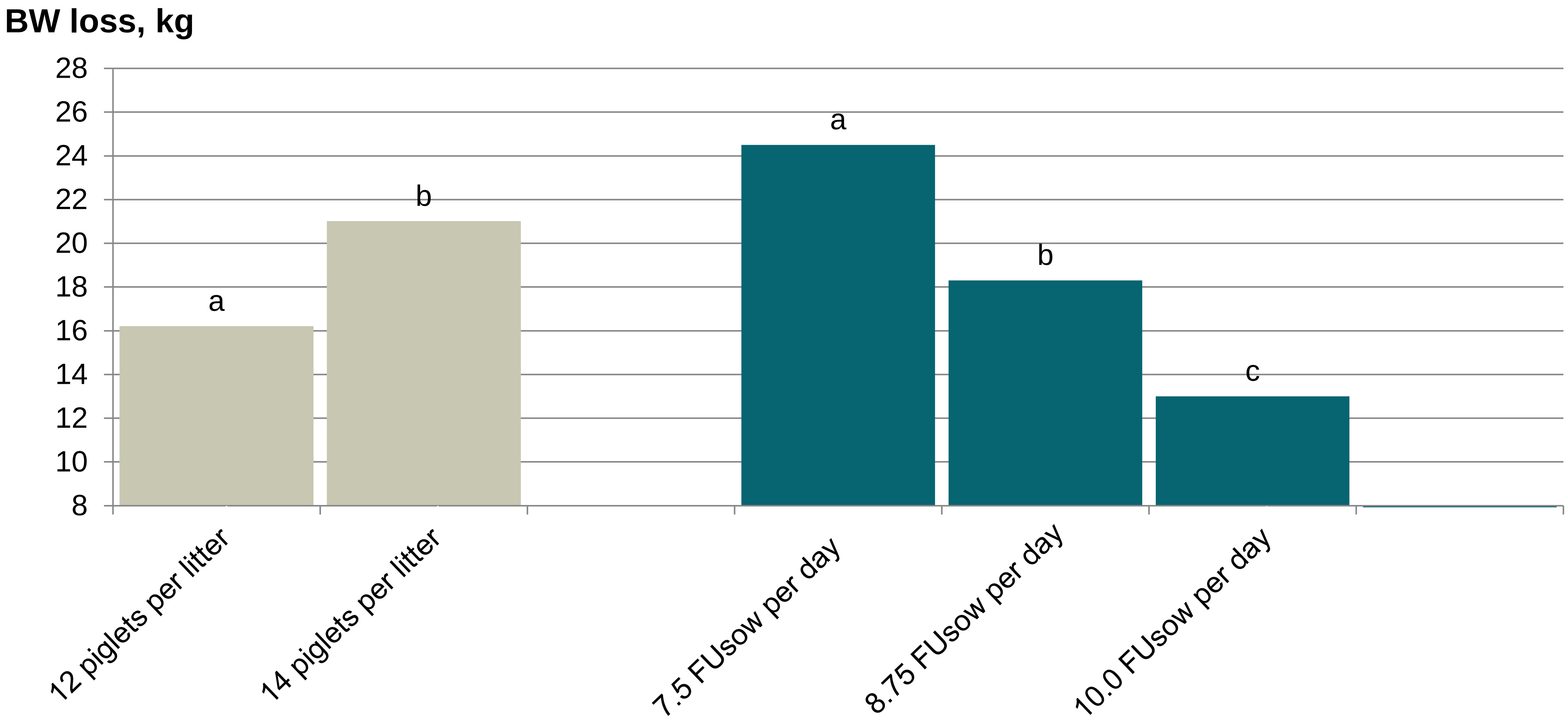
Feeding curve in late lactation
Effective tool to minimise sow body weight loss



Feeding curve in late lactation
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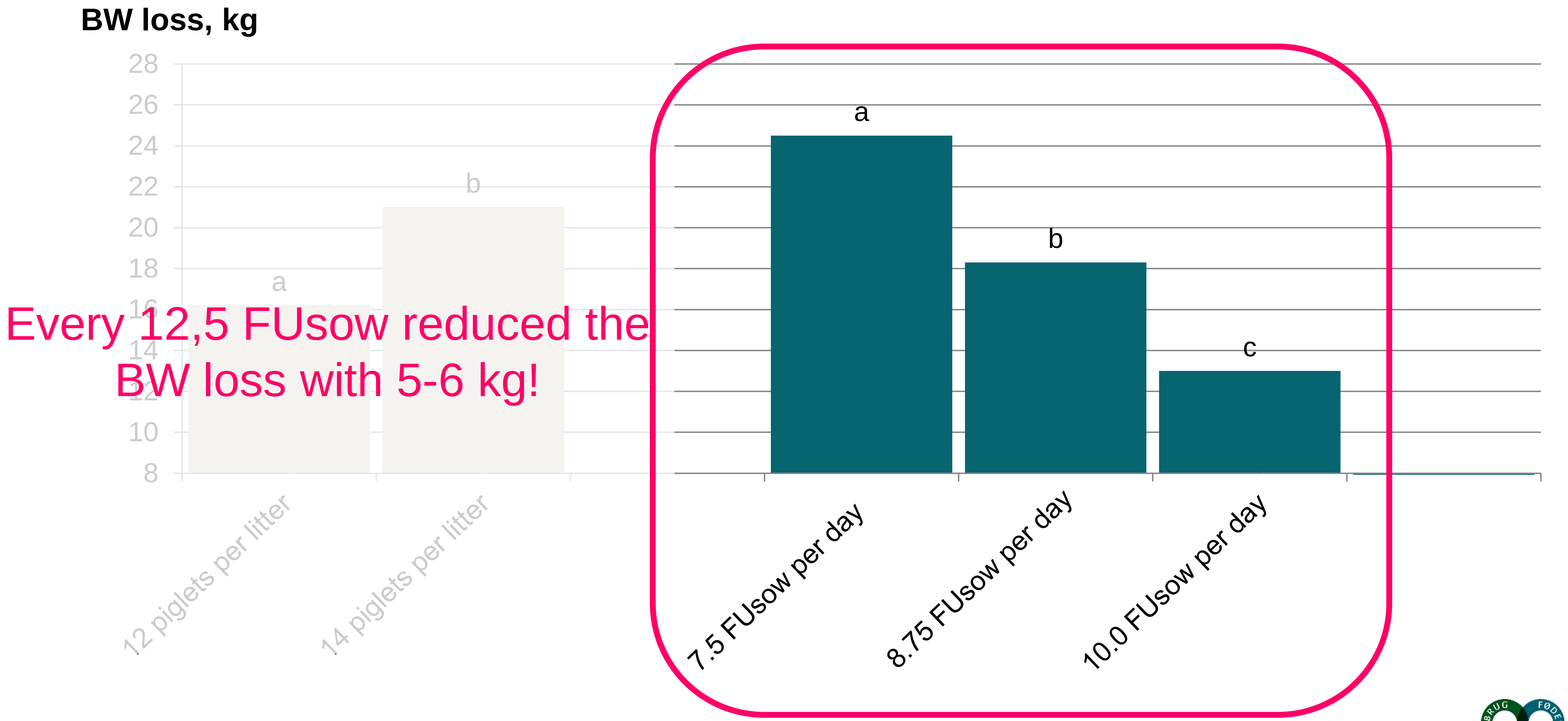

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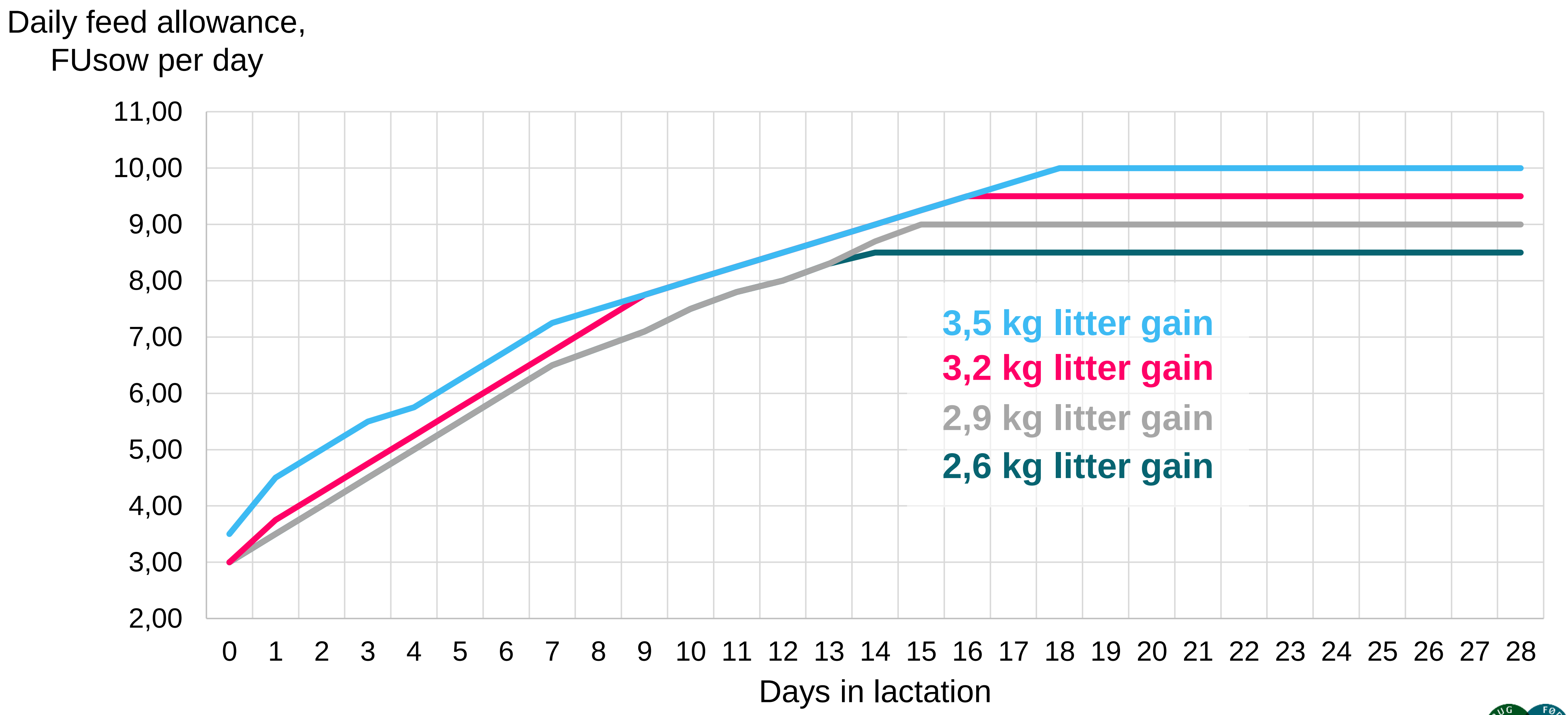
Feeding curves according to litter gain

Many curves to control



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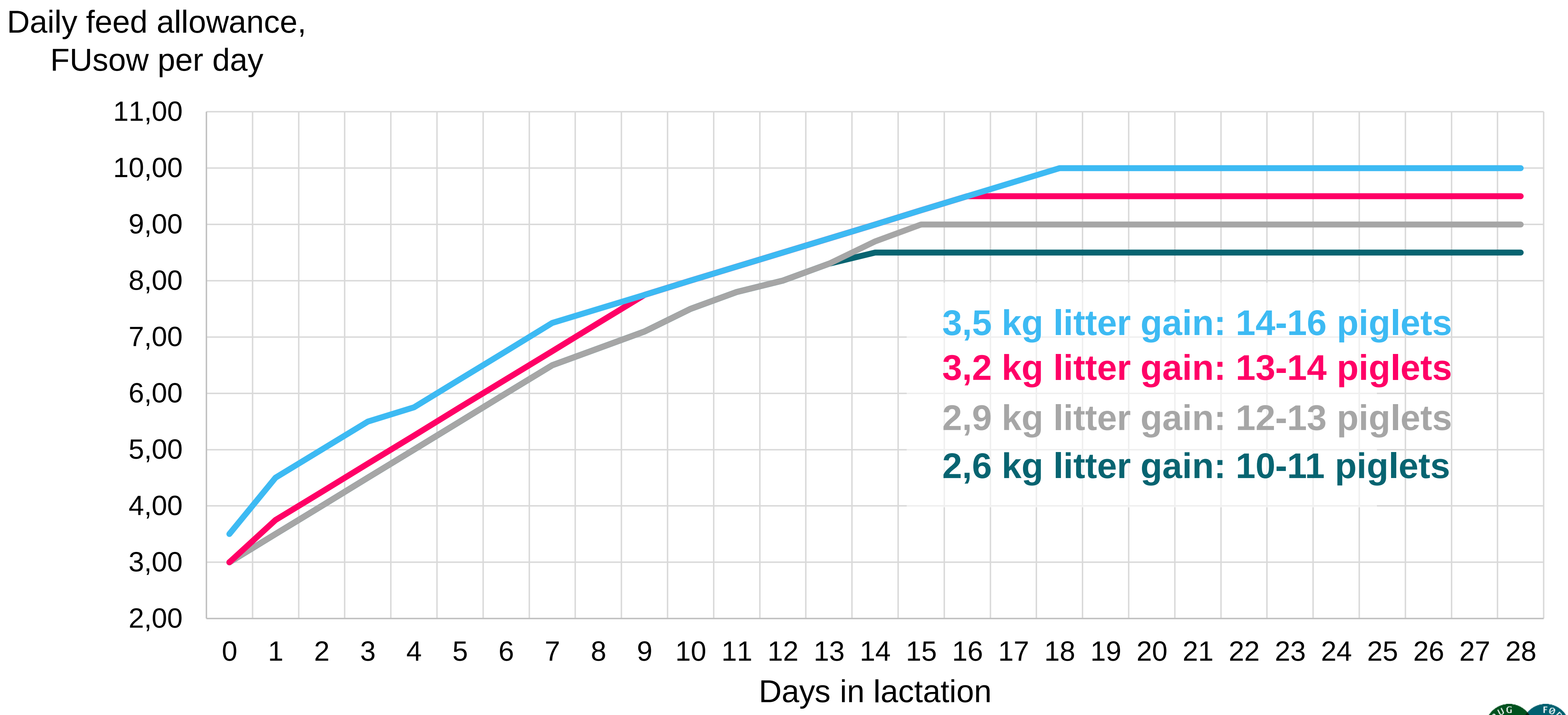

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Take home messages
Your choice of feeding curve

- Differentiation between low- and high yielding sows
  - Litter gain (requires weighing of litters)
  - Litter size (an indicator)
- The choice of feeding curve is yours and the wrong choice may cause
  - High yielding sows to lose weight
  - Low yielding sows to gain weight
- Recommendations:
  - Pay attention to sows that nurse large litters (higher feed allowance)
  - Be careful with sows that nurse small litters (lower feed allowance)

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