

UNIVERSITY OF COPENHAGEN Department of Large Animal Sciences

Faculty of Health and Medical Sciences

The effect of dietary valine-to-lysine ratio of lactating sows on milk composition and piglet gain

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Background


- The right ratio between lysine and other essential amino acids -> optimal utilization of dietary protein
- Results from literature on valine-to-lysine ratio for lactating sows:
 - Optimal valine-to-lysine ratio varies between studies.
 - Studies with few sows
- Synthetic valine is now available
 - Easier to change dietary valine-to-lysine ratio without major changes in crude protein content



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Hypothesis and objective

- Hypothesis:** The best valine-to-lysine ratio would
 - Improve milk composition
 - Increase piglet growth
- Objective:** To test the effect of six dietary valine-to-lysine ratios for lactating sows on milk composition and piglet growth.



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Material and methods

Overall project

- Conducted
- 480 Danish
- Experiment

This presentation:

- Milk composition
- Litter weight
- Litter gain

Measurements:

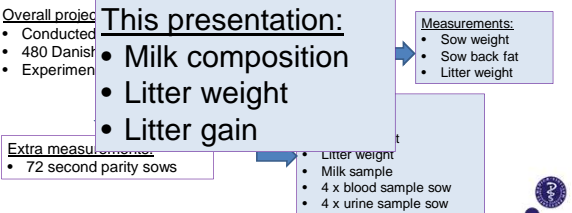

- Sow weight
- Sow back fat
- Litter weight

Extra measurements:

- 72 second parity sows

Litter weight:

- Milk sample
- 4 x blood sample sow
- 4 x urine sample sow

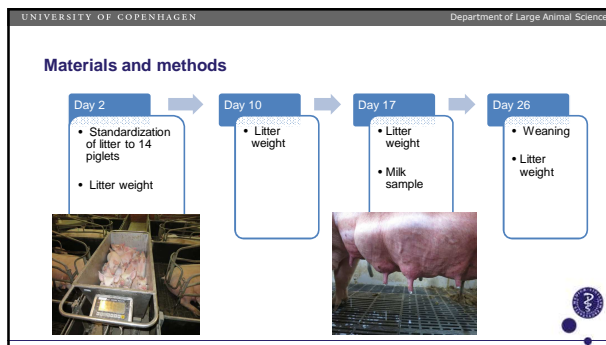



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Materials and methods

- Sow were allotted to one of six dietary treatments:

Composition	Diet					
	1	2	3	4	5	6
Crude protein, %	14.2	14.2	14.2	14.2	14.2	14.2
Standard digestible lysine, g/kg	7.1	7.1	7.1	7.1	7.1	7.1
Standard digestible valine, g/kg	5.4	5.6	5.8	6.1	6.5	6.9
Standard digestible Val:Lys, %	75.8	79.0	82.0	85.0	91.0	97.0
Total Val:Lys, %	80.1	82.9	85.5	88.1	93.3	98.5



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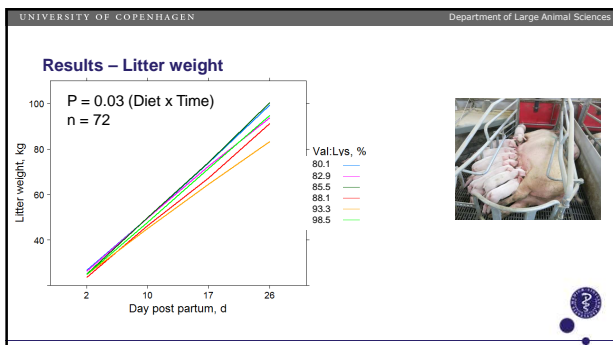
Results – Feed intake

	Diet						SE	P-value
	1	2	3	4	5	6		
Val:Lys, %	80.1	82.9	85.5	88.1	93.3	98.5		Diet
n	12	12	12	11	13	10		
Feed intake, kg/d	Average intake: 6.1 ± 0.8 kg/d						0.24	0.66
Valine intake, g/d	Average valine intake: 43.2 ± 5.8 g/d						1.81	0.35

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Results – Milk composition

	Diet						SE	P-value
	1	2	3	4	5	6		
Val:Lys, %	80.1	82.9	85.5	88.1	93.3	98.5		Diet
n	8	9	10	8	9	6		
Dry matter, %	Average DM: 17.4 ± 1.5 %						0.64	0.33
Lactose, %	Average lactose: 5.6 ± 0.4 %						0.20	0.05
Protein, %	Average protein : 4.7 ± 0.4 %						0.19	0.90
Fat, %	Average fat: 7.2 ± 1.3 %						0.57	0.37



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Results – Average daily gain (ADG) of litter

	Diet						SE	P-value
	1	2	3	4	5	6		
Val:Lys, %	80.1	82.9	85.5	88.1	93.3	98.5		Diet
n	12	12	12	12	13	11		
Litter size weaning	Average litter size: 12.8 ± 1.2 piglets							0.25
ADG, kg/d	Average ADG: 3.0 ± 0.6 kg/d							0.08

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Conclusion

- No effect of increasing Val:Lys on
 - Milk composition
 - Litter ADG
- No need to increase Val:Lys above 80%

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Thank you for your attention!

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