Faculty of Health and Medical Sciences

Presentation 154

Increasing dietary valine-to-lysine ratio did not affect sow and litter performance during lactation

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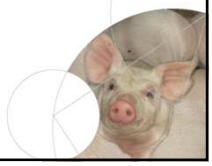


Background

- 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

Hypothesis and objective

- **Hypothesis:** The best valine-to-lysine ratio would
  - Increase litter growth
  - Prevent excessive body mobilization
- **Objective:** To test the effect of six dietary valine-to-lysine ratios for lactating sows on sow metabolism and performance and litter growth.

Materials and Methods

- Conducted in a Danish farm from 2013 to 2014
- 558 sows (parity 1 to 4)
- Experimental period: d 2 to 26 post-partum

- Sows were allotted to one of six dietary treatments from d 2 post-partum:

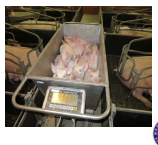
	Diet					
	1	2	3	4	5	6
Composition						
Crude protein, %	14.2	14.2	14.2	14.2	14.2	14.2
Standard digestible lysine, g/kg	7.1	7.1	7.1	7.1	7.1	7.1
Standard digestible valine, g/kg	5.4	5.6	5.8	6.1	6.5	6.9
Total Val:Lys, % (analysed)	**82.5**	**85.5**	**87.7**	**90.0**	**94.5**	**98.3**

Measurements – all sows (n=558)

Day -7
- BW sow
- BF sow

Day 2
- Litter standardized to 14 piglets
- Litter weight
- BW sow
- BF sow

Day 26
- Weaning
- Litter weight
- BW sow
- BF sow



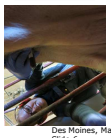
Measurements – subsample of 72 second parity sows

Day 2
- Blood sample
- Urine sample

Day 10
- Blood sample
- Urine sample
- Litter weight

Day 17
- Blood sample
- Urine sample
- Litter weight
- Milk sample
- BW sow
- BF sow

Day 26
- Blood sample
- Urine sample



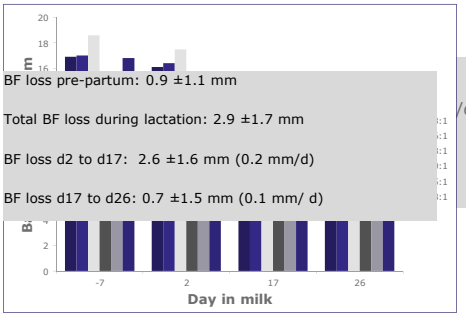
Results – sow feed intake

	Diet							P-value
Val:Lys	82.5	85.5	87.7	90.0	94.5	98.3	SE	Diet
n	93	93	93	93	93	93		
Feed intake, kg/d	6.2	6.2	6.1	6.3	6.1	6.1	0.13	0.23
Weaning day	25.0	25.0	25.5	25.3	25.3	25.3	0.32	0.06
Litter size weaning	13.4	13.6	13.4	13.3	13.3	13.4	0.25	0.09

Results – Litter performance

	Diet							P-value
Val:Lys	82.5	85.5	87.7	90.0	94.5	98.3	SE	Diet
n	93	93	93	93	93	93		
Litter ADG, kg/d	2.85	2.93	2.93	2.89	2.88	2.92	0.06	0.84
Piglet ADG, g/d	214	218	219	217	217	219	4.2	0.89

Results – sow body mobilization



BF loss pre-partum: 0.9 ±1.1 mm

Total BF loss during lactation: 2.9 ±1.7 mm

BF loss d2 to d17: 2.6 ±1.6 mm (0.2 mm/d)

BF loss d17 to d26: 0.7 ±1.5 mm (0.1 mm/ d)

Results – Sow milk yield and composition

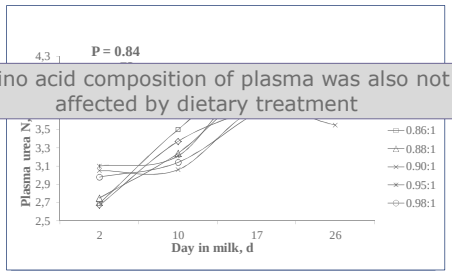
	Diet							P-value
Val:Lys	82.5	85.5	87.7	90.0	94.5	98.3	SE	Diet

Increased dietary Val:Lys -> increased Val, Leu and Ile concentrations in milk (P<0.05)

Concentrations of other AA was not affected

[1]Hansen et al. 2012

Results – Sow plasma metabolites



Amino acid composition of plasma was also not affected by dietary treatment

Conclusions

- **No effect on sow and piglet performance**
- **No need to increase total dietary Val:Lys above 82.5 %**

Thank you for your attention!

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