Increasing duration of feeding sows high dietary lysine and energy prior to farrowing on colostrum quality and yield

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Introduction

- In the 7 days prior to giving birth, the pregnant sow requirements for energy increase by 60% and by 142% for the amino acid lysine.
- These increases support the increased fetal and sow mammary growth. Mammary growth is important for colostrum and milk production.

Objective

- Determine the effect of increasing lysine (an essential amino acid) and energy intake the last 7 or 3 days before farrowing on colostrum yield, composition, and immunoglobulin G concentration.

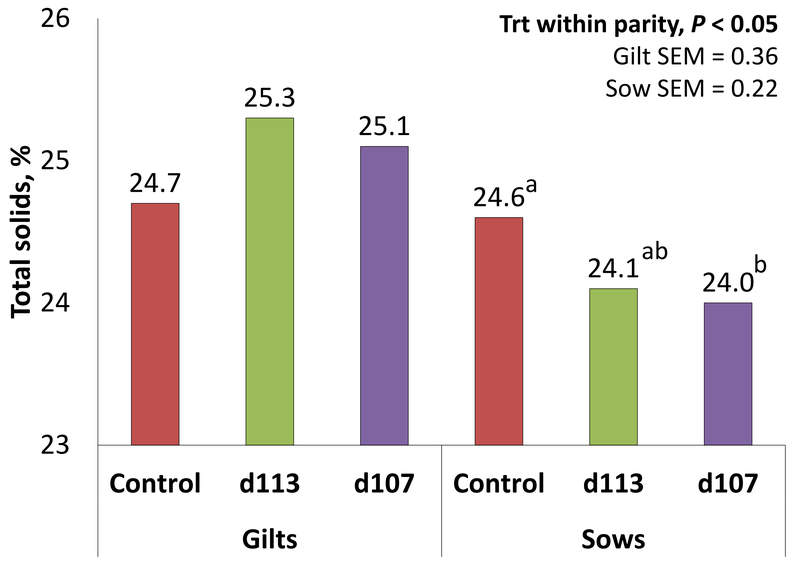
Experimental Design

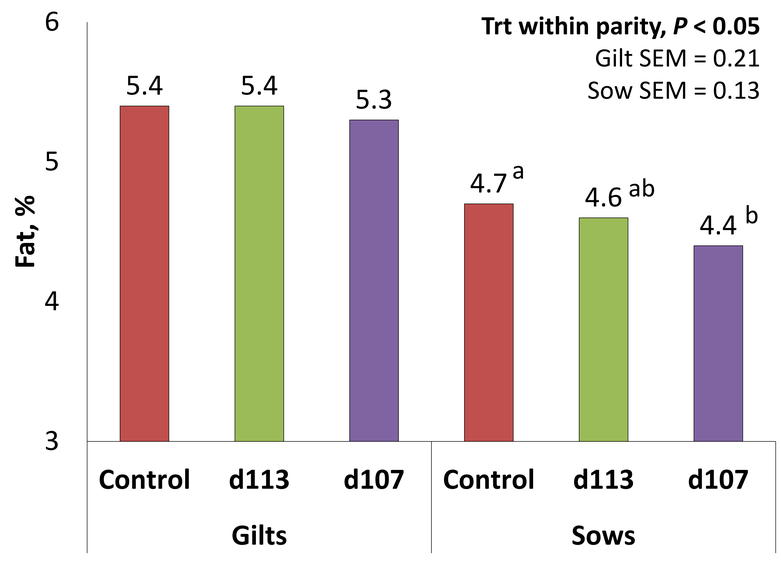
- On d 106 of gestation, a total of 472 mixed parity sows were weighed and randomly assigned to dietary treatments based on farrowing date, weight and parity:
  - **Treatment 1 (control)**:
    - d 107 to 112: 12.5 g SID Lys and 6.5 Mcal ME
    - d 113 to farrow: 28 g SID Lys and 9.4 Mcal ME
  - **Treatment 2 (d 113)**:
    - d 107 to 112: 12.5 g SID Lys and 6.5 Mcal ME
    - d 113 to farrow: 40 g SID Lys and 13.3 Mcal ME
  - **Treatment 3 (d 107)**:
    - d 107 to farrow: 40 g SID Lys and 13.3 Mcal ME

Materials and Methods:

- After birth of the first piglet, 50 mL of colostrum was collected from multiple teats
- Individual piglets were weighed at birth and 24 h to determine colostrum intake and yield
- Samples were analyzed for fat, protein, total solids, and lactose at a DHIA lab (Stearns Lab, Sauk Centre, MN)
- Immunoglobin G was determined using an ELISA (enzyme-linked immunosorbent assay) kit
- Data was analyzed for treatment effects and treatment within parity effects using a mixed model (PROC GLIMMIX SAS ,Version 9.4; Cary, NC)

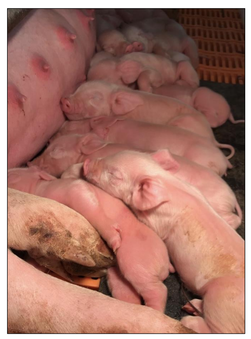
Results

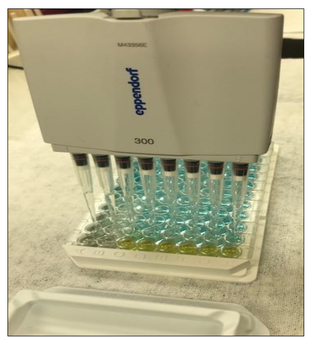




	Gilts				Sows			
Response	Control	d 113	d 107	SEM	Control	d 113	d 107	SEM
Count, n	46	46	45	--	113	110	112	--
Fat[1], %	5.4	5.4	5.3	0.21	4.7[a]	4.6[ab]	4.4[b]	0.13
Protein,%	14.8	14.9	15.1	0.27	15.3	14.9	15.1	0.17
Solids[1], %	24.7	25.3	25.1	0.36	24.6[a]	24.1[ab]	24.0[b]	0.22
Lactose, %	3.2	3.1	3.2	0.05	3.1	3.2	3.2	0.03
IgG[2], mg/ml	107	125	105	1.6	114	131	126	1.3
Colostrum yield[3], kg	5.35	5.37	5.28	0.23	5.99	6.13	6.02	0.13
Colostrum intake[4], g	445	437	436	17.0	461	480	460	11.0

[1]Significant treatment within parity differences. Values within parity category without a common superscript differ ($P < 0.05$).
[2]Main effect of treatment: treatment 1 vs. treatment 2 ($P = 0.081$).
[3]Total colostrum intake for the litter for first 24 h of life.
[4]Average colostrum intake of a piglet for first 24 h of life.





Conclusion

- Sows fed treatment 3 (d 107) had decreased fat and total solids compared to treatment 1 (control) sows, with no evidence for differences in gilts
- Immunoglobin G concentrations tended to increase in females fed treatment 2 (d 113) compared to treatment 1, regardless of parity
- Total protein, lactose, colostrum intake and yield were similar across treatments
- Feeding high lysine and energy for 7 d before farrowing decreased colostrum fat and solids of sows, but no evidence of an impact on other colostrum nutrients or yield

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