

65 Evaluation of Essential Fatty Acids in Lactating Sow Diets on Sow Reproductive Performance, Colostrum and Milk Composition, and Pre-Weaning Litter Growth and Survivability.

Julia P. Holen¹, Jason C. Woodworth¹,
Mike D. Tokach¹, Robert D. Goodband¹,
Joel M. DeRouchey¹, Jordan T. Gebhardt¹,
Ashley DeDecker², Xochitl Martinez², ¹Kansas
State University, ²Smithfield Foods

Abstract: Mixed parity sows (n = 3,451; PIC, Hendersonville, TN) and their litters were used to evaluate the effects of essential fatty acid (EFA) intake on sow reproductive performance, piglet growth and survivability, and colostrum and milk composition. At approximately d 112 of gestation, sows were randomly assigned to 1 of 4 corn-soybean meal-wheat-based lactation diets with 0.5 (Control) or 3% choice white grease (CWG), 3% soybean oil (SO), or a combination of 3% soybean oil and 2% choice white grease (Combination). Thus, sows were provided diets with low EFA [linoleic acid (LA) and α -linolenic acid (ALA)] in diets with CWG or high EFA in diets with SO. Lactation ADFI increased ($P < 0.05$) for sows fed the Combination and CWG diets compared with sows fed the Control or SO diet. Daily LA and ALA intake of sows fed the Combination and SO diets were greater ($P < 0.05$) than sows fed 0.5 or 3% CWG. Overall, sows consuming high EFA from the Combination or SO diets produced litters with heavier ($P < 0.05$) piglet weaning weights and greater ($P < 0.05$) litter ADG when compared with litters from sows fed diets with low EFA provided through CWG. There was no effect of sow EFA intake on piglet survivability ($P > 0.10$). Lactation diet EFA concentration did not influence colostrum or milk dry matter, crude protein, or crude fat content ($P > 0.10$). However, LA and ALA content in colostrum and milk at weaning increased ($P < 0.05$) in response to elevated dietary EFA from SO. There was no evidence for differences ($P > 0.10$) in subsequent sow reproductive or litter performance due to previous lactation EFA intake. In conclusion, increased LA and ALA intake provided by SO during lactation increased overall litter growth and pig weaning weights but did not affect piglet survivability or subsequent performance.

Table 1. Effects of essential fatty acid intake on lactating sow and litter growth performance¹

Trait	Control	SO	CWG	Combination	SEM	Treatment, $P =$
Sows, n	850	874	865	862	---	---
Lactation length, d	24.1	24.0	24.1	24.1	0.11	0.733
Parity	4.7	4.7	4.7	4.7	0.11	0.858
Lactation ADFI, kg	6.64 ^b	6.57 ^b	6.83 ^a	6.88 ^a	0.039	< 0.001
Linoleic acid intake, g/d	83.0 ^d	173.6 ^b	105.1 ^c	198.4 ^a	0.83	< 0.001
α -linolenic acid intake, g/d	6.0 ^d	23.0 ^b	8.2 ^c	26.9 ^a	0.10	< 0.001
Farrowing performance						
Total pigs born, n	15.6	15.7	15.5	15.8	0.14	0.481
Pigs born alive, %	88.4 ^a	87.9 ^{ab}	88.3 ^{ab}	87.4 ^b	0.34	0.033
Stillborn, %	8.9 ^b	9.4 ^{ab}	9.4 ^{ab}	10.2 ^a	0.30	0.003
Pigs weaned, n	11.2	11.2	11.2	11.2	0.11	0.995
Litter growth performance						
Litter wean weight, kg	75.5 ^b	77.1 ^a	76.5 ^{ab}	77.3 ^a	0.62	0.028
Litter ADG, kg	2.46 ^b	2.54 ^a	2.51 ^{ab}	2.55 ^a	0.020	0.003

^{a-b}Means within row with different superscripts differ ($P < 0.05$).

Keywords: essential fatty acids, lactation, piglet survivability, sow