

PS; 5 ug/ml) or calcium ionophore A23187 (1 ug/ml). The fatty acid profile of serum and tissues of piglets was significantly effected by the fat source provided to the sow. Arachidonic acid (A=20:4n-6) levels were typically 2-3 fold lower ( $P < 0.0001$ ) in FO vs. LA piglets. Levels of eicosapentaenoic acid (EPA=20:5n-3), the major n-3 fatty acid, in the blood and tissues were 50 to 100 times greater ( $P < 0.0001$ ) in FO vs. LA piglets. PGE<sub>2</sub> production by AM was 70% lower in FO vs. LA pigs (1491 to 435 pg/0.1ml;  $P < 0.02$ ) when stimulated with LPS for 24 hr. PGE<sub>2</sub> production by PEC was 50% lower in FO vs. LA pigs (1245 vs. 2902 pg/0.1ml;  $P < 0.08$ ) when stimulated with A23187. In conclusion, substituting FO for LA in a sow's late-gestation and lactation diet greatly increases the content of n-3 fatty acids in the nursing pig and reduces the PGE<sub>2</sub> production of immune cells.

**KEY WORDS:** Fish oil, immune tissues, prostaglandin E<sub>2</sub>

5 Quantitative influence of lysine and energy intake on yield of milk components in the lactating sow. M. D. Tokach\*, J. E. Pettigrew, B. A. Crooker and A. F. Sower, University of Minnesota, St. Paul.

A regression approach was utilized to quantitatively assess the influence of lysine (Lys) and energy (ME) intake during lactation on yield of milk components, and to determine whether this influence is mediated through precursor metabolite concentrations in the blood. Twenty-three primiparous Landrace x Yorkshire sows were fed corn-soybean meal diets to achieve a range of Lys (15 to 45 g/d) and ME (6.5 to 16.5 Mcal/d) intakes. Milk yield was measured over a 24 h period from d 8 to 9 and d 22 to 23 via deuterium dilution. Milk samples were collected and analyzed for protein, fat, lactose and energy to determine total milk component yield/d. Mean values (SD) for each milk component on d 22 were: Yield 9,681 (1,268) g/d; protein 487 (54) g/d; fat 603 (108) g/d; lactose 521 (77) g/d; and energy 10,333 (1,522) kcal/d. Circulating levels of glucose, amino acids, triglycerides, nonesterified fatty acids and adenosine triphosphate were also measured. Regression parameters and R<sup>2</sup> for each model predicting yield of milk components on d 22 from Lys and ME intake are listed in the table. The interaction (Lys\*ME) was significant ( $P < .05$ ) for all models except lactose, demonstrating that Lys intake needed to maximize milk production increases markedly as ME intake increases. Lys and ME intake explained a smaller portion of the variability in milk component yield on d 8 ( $R^2 < .51$ ) than on d 22, evidence that dietary influences on milk production increase as lactation progresses. Regression analyses revealed strong connections between diet and metabolite concentrations on d 22 ( $R^2 = .5$  to  $.7$ ), but no obvious relationships between precursor metabolite concentrations and milk component yield ( $R^2 = .1$  to  $.4$ ). In conclusion, these results reveal quantitatively the prominent interactive effects of lys and ME intake on yield of milk components. These effects do not appear to be directly associated with changes in precursor pool concentrations.

Item	Intercept	Lys	ME	Lys <sup>2</sup>	ME <sup>2</sup>	Lys*ME	R <sup>2</sup>
Yield	6,803.6	73.67	-64.49	-4.37	-4.63	21.74	.74
Protein	301.9	13.41	-12.39	-.36	-.37	1.10	.78
Fat	660.3	7.68	-53.53	-.39	.52	2.05	.64
Lactose	274.4	2.88	10.69	-.18	-.35	.95	.73
Energy	8,994.2	148.90	-500.47	-6.28	-.71	29.19	.69

**KEY WORDS:** Milk production, Lactating sow, Nutrition

Feeding regimen during gestation affects feed intake and feeding behavior of primiparous sows during lactation. W. C. Weldon\*, A. J. Lewis, G. F. Louis and M. A. Giesemann. University of Nebraska, Lincoln.

The voluntary feed intake of primiparous sows during early lactation is frequently inadequate to support milk production and prevent excessive weight loss. To investigate the relationship between feeding regimen during gestation and feed intake during lactation, 15 crossbred, primiparous sows were assigned to two dietary treatments. From d 60 of gestation to farrowing, the intake of eight sows was restricted to 1.85 kg/d (R) while seven sows were allowed to eat ad libitum (AL). During a 28-d lactation, litter size was standardized to 10 pigs, and all sows were given ad libitum access to feed. Daily intake was measured throughout gestation and lactation, and on d 105 of gestation and d 1, 7, 14 and 21 of lactation the time and quantity of each meal consumed were recorded. During the gestation period, total feed intake of R sows was less than that of AL sows (73.7 vs 148.8 kg;  $P < .001$ ), but feed intake of the AL group decreased quadratically ( $P < .01$ ) as gestation progressed. During lactation, R sows ate more than AL sows (151.9 vs 79.2 kg;  $P < .001$ ). Feed intake of both