
Two hundred and seventy-two first parity sows were used to evaluate the effect of lysine intake and sources of lysine on lactation and reproductive performance. At parturition, sows were standardized to greater than nine pigs, and sows were allotted to one of three dietary treatments. Treatment 1 (T1) was a corn-SBM diet containing .9% lysine. Treatment 2 (T2) was a 1.2% lysine diet, formulated by adding .37% L-lysine, 13% L-threonine, .08% DL-methionine, and .05% L-tryptophan to diet 1. Treatment 3 (T3) was a 1.2% lysine diet, formulated by adding 1% fish meal, 5.5% SBM, 15% soybean meal, and 25% threonine to diet 1. Sows were given ad libitum access to feed during lactation. Daily feed intake, birth weights, litter weights, and the weaning to estrus interval were measured. Daily maximum temperature data were obtained from the National Climatic Data Center (Cincinnati, IN). Daily lysine intake (g) was lower (P < .001) in sows given T1 (50.02 ± .59) compared to T2 (66.23 ± .64) and T3 (66.36 ± .59). Daily feed intake (kg) (T1, 5.56 ± .05; T2, 5.92 ± .06; T3, 5.53 ± .05), sow weight change (kg) (T1, 5.44 ± .82; T2, 6.57 ± .89; T3, 5.44 ± .82), and adjusted litter weaning weight (kg) (T1, 53.27 ± .84; T2, 51.56 ± .91; T3, 51.8 ± .83) were not different among dietary treatments. Weaning to estrus interval (d) was higher (P < .05) in T1 sows (14.95 ± 1.29) compared to T2 (11.13 ± 1.40) and T3 (10.56 ± 1.29). Regression analysis of environmental temperature on weaning to estrus interval in T1 was positive (b = 0.42, P < .05) while no relationship was found for T2 and T3. In this experiment, no positive effect on lactation performance was obtained by increasing the daily lysine intake from 50 to 66 g. However, these data suggest that in first parity sows, reproductive performance is improved by increasing daily lysine intake above that required to maximize lactation performance.

Key Words: Lysine, First parity sow, Wean to estrus interval

161 Lysine requirement of the lactating primiparous sow. K. J. Touchette3, G. L. Aller4, M. D. Newcomb5, K. M. Halpin6, and R. D. Boyd2. 3University of Missouri, Columbia, 4 Archer Daniels Midland Co., Decatur, IL, 5Pig Improvement Co., Franklin, KY.

The effects of lysine intake during lactation on litter growth and sow characteristics were evaluated at a commercial farm in Missouri from June to September. Primiparous sows (N = 289), initially weighing 181.0 kg, with 22.4 mm backfat (BF) and 37.5 cm2 loin eye area (LEA), were randomly assigned to one of five corn-soybean meal lactation diets. The first four diets contained 0.80, 1.04, 1.28, and 1.52% lysine, from intact protein sources. These diets were formulated to contain the same ratios to lysine for valine, threonine, and methionine. The fifth diet contained 1.28% lysine with no synthetic amino acids. All diets contained 4% linseed meal, 3400 kcal/kg ME, and exceeded NRC (1988) requirements for other amino acids, vitamins, and minerals. Dietary lysine did not affect ADPI. Dietary lysine had no effect on litter ADG or sow BF change. Increasing dietary lysine reduced sow weight loss (P < .05) and LEA loss (P < .01). Litters from sows fed the 1.28% lysine diet with synthetic valine, threonine, and methionine had a lower ADG than those from sows fed the 1.28% lysine diet with no synthetic amino acids (P < .05). There were no differences between these two treatments for sow weight, LEA, or BF change. Lysine intake had no effect on percent of sows mated by day 7 post weaning. A high lysine intake may not increase milk production, it does minimize weight and LEA loss for primiparous sows nursing 10 pigs per litter in a 17 day lactation.

Key Words: Primiparous Sows, Lactation, Lysine

hundred twenty pigs (70.7 ± 1.2 kg) were utilized to measure the effect of three levels of lysine in barley-based diets on performance and intestinal morphology of finishing barrows pigs. Pigs were grouped by sex, weight and ancestry to one of treatments in a randomized block design. Treatments were a corn-based diet (7.5% lysine) and three barley-based diets containing .75, .85, and .95% lysine, respectively. Pig weight and consumption were recorded weekly to determine average gain, daily feed intake and feed efficiency. Pigs were weaned from the experiment at a mean pen weight of 118 ± 32 lb. A pig was randomly selected from each pen (32 pens) and used with bromodeoxy uridine (BrDU; 5 mg/kg BW) and exanthanated one hour post-injection. Jejunum and ileum sections (5) were removed without stripping, washed in saline, weighed placed in Carnoy's solution. Bromodeoxy uridine labelling x, a measure of cellular proliferation, was determined by using labelled crypt cells by total crypt cells present. Gilts utilizing the barley-based diet with increasing lysine concentration exhibited a linear increase in days on test (49.0, 50.8, 54.2 1.6 days; P < .04) and a linear decrease in average daily gain, .93, .88 ± .02 kg; P < .05. Conversely, barrows had a linear increase in average daily gain (P < .05) and feed efficiency (P < .05) response to increasing lysine levels. Number of proliferating cells increased (P < .10) with the increasing lysine levels in barley-based diets (5.8, 15.5, 18.4 ± .08%). Pigs consuming control diet had a larger percentage (P < .05) of jejunal crypt proliferation with the .75% lysine barley diet. Ailing index in ileal tissues was consistent across treatments. Results suggest that addition of lysine resulted in increased cell proliferation in the jejunum but did not improve gain or feed efficiency of pigs.

Words: Lysine, Growth, Intestinal Morphology

59 Increasing dietary valine and isoleucine for the high-fattening lactating sow. B. T. Richert4, R. D. Goodband, M. D. Tokach, J. L. Nelssen, Kansas State University, Manhattan.

hundred eighty-five (n = 24 to 27) sows (PIC, Line C-15) were used to evaluate the interrelationship between isolation (1) and valine (Val) on and litter performance. Diets were formulated to .90% total lysine with amino acids other than Ile and Val at least 10% of their suggested rate relative to lysine. The control diet was formulated to contain 5% Val, L-Val and L-Ile replaced corn starch to provide .72 or 1.07% any Val, combined with .50, .85, and 1.20% Ile. A seventh diet contained 1.42% Val. Average number pigs weaned was 10.9, and average strain length was 203.3. Number of pigs weaned was not affected (25) by dietary Ile or Val. Sow ADPI decreased as dietary Val increased (88). Litter weight and weight gain (LGW) at weaning (WN) increased dietary Val (P < .07). Ile (linear, P < .07), and total branched chain amino acids is (linear, P < .02) increased (see table below). Increasing dietary Val to .6 k increased LGW (P < .08). Milk samples were collected on d 17 or 18 and 20 from 12 sow/treatment. Increasing dietary Val at .50% Ile increased concentrations of milk DM and fat (linear, P < .01). Milk DM, CP, fat increased (linear, P < .002) as dietary Ile increased. As a percentage milk, the casein fraction increased (linear, P < .01) and the whey protein-N fraction decreased (linear, P < .06, P < .01), respectively intestine Ile increased. Based on these results, when either Val or Ile are strict, increasing levels of the other branched chain amino acid increase G. However, when Val is adequate in the diet (1.07%), the Ile requirement appears to be no greater than 94% of lysine.

y Words: Lactation, Sows, Branched chain amino acids

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