

Title: Sow performance in response to dietary betaine fed in lactation and weaning-to-35 d post-insemination during moderate heat stress – NPB #13-052

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Scientific Abstract:

The study was conducted to evaluate the effect of feeding dietary betaine during lactation and weaning-to-35 d post-insemination on sow reproductive performance during the summer months. A total of 649 sows were balanced by parity (169, 153, and 327 sows representing parity 1, 2, and 3 to 6) and assigned within parity to a 2 x 2 factorial arrangement of treatments. Factors included betaine concentration: 1) in lactation (0 or 0.2%) and 2) from weaning through early gestation (0 or 0.2%). Lactation diets were corn-soybean meal based with 10% rice bran and 6.0% wheat middlings, and formulated to contain 651 ppm of choline, 3.31 g SID Lys/Mcal ME and a SID Met+Cys:Lys ratio of 0.56. Gestation diets were corn-soybean meal based with 30% wheat middlings, 15% rice bran, and formulated to contain 651 ppm choline, 1.82 g SID Lys/Mcal ME and a SID Met+Cys:Lys ratio of 0.69. Sows were started on lactation diets the day they farrowed. Sows that did not return to estrus within 14 d after weaning were removed from further study. Data were analyzed using the MIXED procedure of SAS and GLIMMIX was used for dichotomous variables using the logit link function. Average room temperature was 25.2±2°C during lactation and 24.1±3°C during the weaning-to-35 d post-insemination period. Sows that received the betaine supplemented diet during lactation had greater body weight losses (1.02 vs 1.18 kg/d, SEM ± 0.06, $P = 0.002$) due to lower feed intake (4.29 vs. 4.14 kg/d, SEM ± 0.07, $P = 0.08$). No difference in litter gain (52.3 vs. 51.35 kg, SEM ± 0.6, $P = 0.16$) and number of pigs weaned were observed (10.95 vs. 10.90, SEM ± 0.5, $P = 0.50$). Feed efficiency was greater (0.327 vs. 0.284, SEM ± 0.01, $P = 0.001$) for sows fed the diet without betaine. Feeding betaine post-weaning tended to increase ($P=0.08$) the number of sows returning to estrus within 14 d (0.92 vs. 0.88, SEM ±0.03) and to reduce wean-to-estrus interval (5.78 vs. 6.68, SEM ± 0.4, $P = 0.06$). Supplementation of betaine to mature sows post-weaning reduced farrowing rate (0.897 vs. 0.790, SEM±0.025, Interaction, $P = 0.07$). Feeding betaine post-weaning to parity 1 sows resulted in the greatest number of total pigs born ($P < 0.08$) and pigs born alive ($P < 0.05$). Feeding betaine during lactation to parity 4+ sows provided the greatest total number of pigs born ($P < 0.08$). Parity 2 and 3 did not respond to betaine supplementation for subsequent litter size. Feeding betaine post-weaning to parity 1 and 2 sows reduced respiration rate (22.0 vs. 15.8 breaths per minute, SEM ± 2, $P = 0.03$). Results suggest that the use of 0.2% betaine during lactation did not improve sow and litter performance. However, the use of 0.2% betaine during lactation increased litter size in sows of parity 4 or greater. In addition, the use of 0.2% of betaine post-weaning increased the number of sows bred in a shorter interval after weaning. Moreover, feeding betaine post-weaning increased litter size in parity 1 sows.

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