4 **The effect of supplemental dietary taurine upon performance of sows and their progeny.** S. M. El-Kandelgy[1], D. D. Koehler[1], R. L. sher[1], G. C. Shurson[1], R. D. Goodrich[1] and B. J. rr[2]. [1]University of Minnesota, St. Paul and itri-Quest, Inc., Chesterfield, MO.

> groups of 24 sows were used to study the effect 0.5% supplemental dietary taurine on sow perfor- ace. Sows received 3.5 kg/d of a 13% CP diet ring gestation and had ad libitum access to a .5% CP diet during lactation. Sows supplemented th taurine (T) received the same diets except for addition of 0.5% supplemental taurine. Taurine ets were fed from day 107 of gestation to weaning study 1, and from breeding to farrowing in study In both studies, dietary taurine failed to im- ove number of piglets born, born alive, and sur- val to 21 d. In study 2, sows fed T had signif- antly higher lactation weight losses than sows fed ntrol (C) diets (14.3 vs 10.1 kg, P < .05), but re not different in lactation backfat loss. Lacta- on feed intake in study 2 was significantly lower 9 vs 111 kg, P < .01) for sows fed T vs C diets. A tal of 144 pigs (progeny of study 1 sows) were aned at 21d and allotted to a starter trial in a 2 factorial arrangement (T or C sow diets and T or starter diets). A 21% CP corn-soy diet with 10% pplemental lactose served as the control (C) diet. e taurine (T) diet was identical to C except for e addition of 0.5% taurine. No milk products were cluded in either starter diet. There was no im- ovement in daily gain or feed efficiency due to T pplementation of starter diets. However, pigs ich were weaned from sows fed T had improved feed ficiency (.81 vs .67 G/F, P < .10) and a non- gnificant trend toward increased daily gains (190 158 g) during the first week of the four week ial. In conclusion, taurine failed to improve pig rformance when supplemented in nursery diets, but urine supplementation of gestation and lactation ets tended to improve post-weaning performance of gs, and merits further investigation.

ey Words: Sows, Gestation, Dietary taurine

26 Riboflavin nutrition of sows. J. E. Pettigrew[*1], S. M. El-Kandelgy[1], L. J. Johnston[2], and G. C. Shurson[1]. University of Minnesota, St. Paul[1] and Morris[2].

high concentration of riboflavin in uterine flushings of gilts early pregnancy suggests a short-term high riboflavin quirement, and provision of a large dose of dietary riboflavin that time has been suggested to improve % farrowing and litter ze. Two studies of the responses of sows to very high dietary boflavin levels were conducted. Experiment 1 examined the effect low (2.8 mg/kg; LR) or high (52.8 mg/kg; HR) dietary riboflavin ncentrations on a biochemical index of riboflavin status, ythrocyte glutathione reductase activity coefficient (EGRAC), of crossbred sows throughout the reproductive cycle. Diets were fed sows during one complete reproductive cycle beginning in mid- station. Values of EGRAC at 4-wk intervals from the start of the periment to weaning, on d 8 postbreeding, and at 2-wk intervals til the end of the experiment were higher (more riboflavin- ficient; P<.01) for sows fed LR. The highest EGRAC (1.68) of sows d LR occurred in mid-lactation; EGRAC of LR sows at d 8 stbreeding was 1.49. Corresponding EGRAC for HR sows were 1.16 d 1.24, respectively. Experiment 2 evaluated the effect of 4 vels of dietary riboflavin (10, 60, 110, or 160 mg/day) during e first 21 d postbrooding. A total of 113 mixed-parity crossbred ws were used in 2 farrowing groups at each of 2 farms. The % rrowing was higher (P<.10) on the 3 high levels of riboflavin an on 10 mg/d. There were no effects (P>.10) of riboflavin intake litter size, sow weight change or any other measure of productive performance, or on EGRAC measured at breeding, on days , 50 or 100 of pregnancy, or in mid-lactation. These results ggest that sows are not unusually susceptible to riboflavin ficiency during early pregnancy, and that a high riboflavin take at that time does not increase litter size. However, high boflavin intake (60 to 160 mg/d) during early pregnancy may crease % farrowing.

Item	Dietary riboflavin, mg/day 10	60	110	160	Error mean square
% farrowed	74.1	92.3	90.3	89.7	--
Pigs born alive/litter	9.62	10.07	10.45	9.86	7.87
Pigs weaned/ litter	9.16	9.04	9.72	9.12	5.97
Mean to estrus, days	5.00	5.02	4.84	5.85	2.85

y Words: Riboflavin, Sows, Reproduction

125 Effect of heat stress and dietary energy on embryo survival and gilt performance from days 3 to 24 postmating. C. W. Liao* and T. L. Veum, University of Missouri, Columbia.

A total of 72 bred gilts were used in three trials, 24 gilts per trial, to study the effect of dietary energy and constant heat stress on embryo survival and gilt performance. Gilts were bred by artificial insemination using pooled semen and brought into the environmental chambers on d 3 postmating without any adjustment period. Experiment was a 2 X 2 factorial arrangement of the treatments with two constant temperatures, thermoneutral at 23±1°C or heat stress at 32±2°C; and two dietary ME intakes, 5.40 or 8.10 Mcal of ME per gilt daily. Diets were formulated to equalize daily nutrient intake for each gilt except for ME. Diet intake was 1.60 kg/d for gilts fed 5.40 Mcal ME/d. The 8.10 Mcal ME diet was made by adding 0.35 kg of lard to the 5.40 Mcal ME diet. Diets were fed once a day at 0800. Water was supplied ad libitum. At day 24±2 postmating, the gilts were slaughtered. Ovaries and reproductive tracts were collected. The number of corpora lutea and live embryos, and embryo length and weight were determined. Embryo survival was calculated as the ratio of the number of live embryos compared to the number of corpora lutea. Average daily gain, backfat thickness and dressing percent were determined. Trials were pooled and the data were analyzed by ANOVA with a factorial arrangement of the treatments. There were no interactions (P>.40) between dietary energy and temperature for any criteria measured. High energy did not affect (P>.40) embryo survival. Average daily gain was lower for gilts fed the low energy diet (P<.01) or subjected to heat stress (P<.01). Gilts housed in the hot chamber had a smaller number of corpora lutea (P<.06) and live embryos (9.9 vs 11.9, P<.04), and a lower percent of embryo survival (71.6 vs 82.6, P<.06) than gilts housed in the thermoneutral chamber. In conclusion, heat stress had a detrimental effect on embryo survival while dietary energy did not affect embryo survival during early pregnancy.

Key Words: Bred Gilts, Heat Stress, Embryo Survival

127 The interrelationships between dietary lysine and litter size on sow and litter performance. J. L. Lauria*, J. L. Nelssen, R. D. Goodband, and M. D. Tokach, Kansas State University, Manhattan.

One-hundred ninety-three primiparous sows were used in a study with the objective to determine the influence of four litter sizes on the dietary lysine requirement of lactating sows as measured by litter performance and sow weight loss. At farrowing, sows were randomly assigned to one of three corn-soybean meal diets (.67, .94, or 1.22 % lysine) and standardized to one of four litter sizes (8, 9, 10, or 11 pigs). Sows were fed 3.5, 4.5, and 5.5 kg/d of their respective diets from d 0 to 7, 7 to 14, and 14 to 21 of lactation. This provided daily lysine intakes of 24.3, 32.8, and 42.6; 30.1, 42.2, and 54.8; and 36.8, 51.6, and 67.0 g during d 0 to 7, 7 to 14, and 14 to 21, respectively. Ratios of all other essential amino acids were kept constant to ensure lysine was first limiting. All diets contained 5% soybean oil. Sows were fed twice daily and feed disappearance was recorded each day. Litters were adjusted to their treatment size within 72 h after farrowing. If a pig died during the lactation period a pig of similar age and weight was used as a replacement. Sows and litters were weighed weekly and average backfat was measured at farrowing and weaning. During d 0 to 7 of lactation, increasing litter size (P < .03) and dietary lysine (P < .10) increased litter weight gain. There was a tendency (P = .12) for a lysine × litter size interaction. Litter weight gain of sows nursing 8 or 9 pigs was not affected by increasing dietary lysine; however, increasing dietary lysine increased litter weight gain of sows nursing 10 or 11 pigs. Increasing litter size increased (P < .03) litter weight gain d 7 to 14 with a numerical (P < .17) interactive increase in litter weight gain as lysine and litter size increased. However, for the 14 to 21 d lactation period, a lysine × litter size interaction was not observed (P > .90). Neither increasing litter size nor lysine influenced litter weight gain. Sow weight loss (d 0 to 21) was increased (P < .01) by increasing litter size but decreased (P < .02) by increasing lysine intake. Sow backfat loss was unaffected by either litter size or dietary lysine. In conclusion, in early lactation, litter size interactively affects the sow's dietary lysine requirement. However, large litter sizes appear to shift peak litter gain earlier in lactation, thereby minimizing the influence of dietary lysine during late lactation (d 14 to 21). Interaction means of dietary lysine and litter size are reported below.

	.67 % Lysine				.94 % Lysine				1.22 % Lysine				
Litter gain, kg	8	9	10	11	8	9	10	11	8	9	10	11	CV
D 0 to 7[abc]	9.7	11.6	10.0	11.8	10.9	10.8	12.6	12.4	9.8	11.2	11.5	13.6	20.9
D 7 to 14[b]	15.1	14.4	15.4	16.3	14.6	15.4	15.8	16.9	13.5	14.4	15.4	26.3	58.8
D 14 to 21	10.5	11.0	11.8	12.0	12.9	12.8	12.0	13.6	12.1	13.9	9.9	10.8	109

[a]Dietary lysine × litter size interaction (P < .12). [b] Effect of litter size (P < .03).
[c] Effect of dietary lysine (P < .10).

Key Words: Sows, Lysine, Litter Size