

However, pigs fed thermally-processed diets had greater jowl iodine value compared with those fed mash diets ($P < 0.05$). This experiment again confirms the benefits of thermally processing feeds to improve ADG and G:F, but neither extended conditioning nor extrusion extracted additional nutrients from low energy feedstuffs compared with traditional pelleting. However, this research suggests that more extreme thermal processing conditions may be used for feed safety purposes without hindering nutrient utilization.

Key Words: extrude, pellet, pig

143 Effects of seaweed β -1,3-glucan (Algamune™) on growth performance of weaned piglets.

Z. Cheng^{1,*}, Y. Wang¹, D. Hou¹, H. Zhang¹, Y. Chen¹, H. Lei¹, B. Wang¹, R. Levine², ¹*Animal Nutrition & Feed Center, COFCO Nutrition and Health Institute, Beijing, China*, ²*Algal Scientific Corporation, Northville, MI*.

The experiment was designed to investigate Algamune™ (dried algae containing about 50% β -1,3-glucan) effects on growth performance. Healthy weaned piglets ($n = 192$), aged 35 d, were selected and divided into 4 treatment groups, with each group comprising 4 replicates of 12 pigs each. Pigs were fed ad libitum and given free access to water. The feeding trial ran for 22 d from the start of the nursery period. The experiment comprised 4 treatment groups: a control group (no Algamune™), the feed formula in control group contained soybean meal, extruded soybeans, corn, fish meal and premix, and 3 test groups, the feed formula in test groups were similar to that of control group, except that they also contained 0.05%, 0.1, or 0.15 Algamune™ (equivalent to 500, 1000, 1500 g/MT, respectively). All dietary AA and nutrients met or exceeded NRC (1998) standards. Data were processed using software SPSS16.0 significant difference analysis. Compared with the control group, the test groups showed a trend towards an increase in ADG with the 0.05% β -glucan group showing a 5.1% increase, but the groups were not significantly different ($P = 0.945$, Table 143). Also, ADFI for the 0.05% β -glucan treatment group was numerically higher than the control while higher doses of β -glucan showed numerically lower ADFI ($P = 0.599$, Table 143). Compared with the control group, the 0.1% β -glucan group demonstrated a 4.5% decrease in FCR and the 0.15% β -glucan group a decrease of 7.8% ($P = 0.383$, Table 1). Overall, this experiment suggests a trend that diets supplemented with Algamune™ may improve piglet ADG and FCR, but more work is required to determine the optimal dose and validate any performance enhancements.

Key Words: β -glucan, growth performance, nursery pigs

Table 143. Effect of beta glucan on nursery pigs (mean \pm standard error)

Group	Control	0.05% Algamune™	0.1% Algamune™	0.15% Algamune™
Initial WT, kg	12.21 \pm 1.11	12.12 \pm 2.32	12.18 \pm 2.22	12.17 \pm 1.96
ADG, g	478 \pm 7.5	503 \pm 45.3	487 \pm 76.2	490 \pm 76.2
ADFI, g	738 \pm 87.8	778 \pm 58.0	715 \pm 101.9	692 \pm 104.3
FCR	1.54 \pm 0.17	1.55 \pm 0.09	1.47 \pm 0.05	1.42 \pm 0.13

NONRUMINANT NUTRITION: SOW NUTRITION AND MANAGEMENT

144 Effects of lysine and energy intake during late gestation on weight gain and reproductive performance of gilts and sows under commercial conditions.

M. A. Goncalves*, K. M. Gourley, S. S. Dritz, M. D. Tokach, N. M. Bello, J. M. DeRouchey, J. C. Woodworth, R. D. Goodband, *Kansas State University, Manhattan.*

This experiment was conducted to evaluate the effects of Lys and energy intake during late gestation on reproductive performance of gilts and sows. A total of 1,105 females (PIC 1050) were used from d 90 of gestation until farrowing. Treatments were a $2 \times 2 \times 2$ factorial having 2 parity groups (P1 or P2+), 2 standardized ileal digestible (SID) Lys intakes (10.7 or 20.0 g/d), and 2 energy intakes (4,503 or 6,704 kcal/d intake of NE). Females were housed in pens by parity level, blocked by weight, and individually assigned to the dietary treatments within each weight block. Diets were corn-soybean meal based. Data were analyzed using generalized linear mixed models consisting with pen as the experimental unit for parity, and the individual female as the experimental unit for dietary treatments. Bonferroni adjustment was used to adjust multiple comparisons. Dietary treatments were Low Lys, Low Energy (LL), High Lys, Low Energy (HL), Low Lys, High Energy (LH), and High Lys, High Energy (HH). There were Lys \times Energy ($P < 0.001$) and Parity \times Energy ($P < 0.001$) interactions for BW gain. Increasing Lys or energy increased ($P < 0.001$) BW gain of both gilts and sows; however, the magnitude of response was greater when Lys and energy were increased together (LL: 11.94 \pm 0.40, HL: 14.90 \pm 0.40, LH: 18.45 \pm 0.40, HH: 23.75 \pm 0.40 kg \pm SEM). Further, under high energy intake, there was no evidence for differences ($P = 0.996$) in BW gain between gilts (21.44 \pm 0.39 kg) and sows (20.76 \pm 0.60 kg). However, sows fed low energy intake had less ($P < 0.001$) BW gain (11.95 \pm 0.60 kg) than gilts (14.89 \pm 0.39 kg). There was no evidence for differences between dietary treatments in total pigs born ($P > 0.17$; LL: 15.1 \pm 0.02; HL: 14.7 \pm 0.02; LH: 14.9 \pm 0.02; HH: 14.9 \pm 0.02) or born alive ($P > 0.215$; LL: 14.1 \pm 0.02; HL: 13.8 \pm 0.02; LH: 13.7 \pm 0.02; HH: 13.9 \pm 0.02). There was no evidence for differences between dietary treatments in total litter birth weight ($P > 0.19$; LL: 19.3 \pm 0.21; HL: 19.1 \pm 0.21; LH: 19.2

± 0.21 ; HH: 19.5 ± 0.21 kg). In conclusion, even though the dietary treatments caused large differences in BW gain among gilts and sows, 10.7 g of SID Lys and 4,503 kcal of NE/d was enough to maintain total litter birth weight.

Key Words: energy, lysine, sows

145 **Impact of feeding level postweaning on wean to estrus interval, conception and farrowing rates, and subsequent farrowing performance.**

A. Graham^{1*}, K. J. Touchette², S. Jungst³, M. Tegtmeier¹, J. Connor⁴, L. Greiner¹, ¹*Carthage Innovative Swine Solutions, LLC, Carthage, IL*, ²*Ajinomoto Heartland, Inc., Chicago, IL*, ³*Genus PIC, Hendersonville, TN*, ⁴*Carthage Veterinary Service, Ltd., Carthage, IL*.

Previous research has demonstrated that increasing postweaning feed intake of sows with poor body condition can improve reproductive performance. The objective of this study was to determine the effect of feeding level from weaning to breeding of sows with good body condition on subsequent reproductive performance. Six-hundred-thirty-eight sows (PIC 1050, C29, and C22) were randomly allotted within parity block (P1, P2, P3+) to 1 of 3 treatments after being weaned and moved into the wean sow room to evaluate the effect postweaning feed intake on sow reproductive performance. Treatments were as follows: 2.7 kg of feed daily, 3.6 kg of feed daily, and 5.5 kg of feed daily. Sows in the study had a BCS of 2.75 or greater based on a 5 point scale, with 3 being ideal condition, and had a standard lactation length between 18 to 23 d. At weaning, sows were blocked based on parity and day of weaning and then randomly assigned within block to 1 of the 3 treatments. Diets for the study were corn-soybean meal based with dried distillers grains with solubles and were formulated to contain 0.55% standardized ileal digestible (SID) Lys and 3.2 Mcal Mod ME/kg. All other nutrients met or exceeded NRC requirements for gestating sows. All sows were fed twice daily, with their daily allotment equally divided between the 2 feedings. Sows were provided free access to water. Treatments were maintained until the day the sow was first bred. At breeding, sows were provided 1.8 kg/d ration throughout the gestation period. Data were analyzed using Proc Mixed with LSMEANS reported. Main effects of parity and treatment and the interactions were evaluated. Sow feed intake differed between treatments (2.68, 3.54, 5.18 kg/d; $P < 0.01$). Average wean to estrus (5.13, 4.98, and 4.97 d; $P > 0.10$), conception rates (95.63, 95.58, 94.67%; $P > 0.10$), and subsequent total born (14.33, 13.93, 13.92 pigs/sow; $P > 0.10$) were not significantly different between treatments (2.7, 3.6, or 5.5 kg, respectively). There were no parity by treatment interactions. In conclusion, when sows are in good body condition at weaning, there was no benefit on conception rates or subsequent born alive when feeding above 2.75 kg/d.

Key Words: feed intake, sow, wean to estrus

146 **Understanding the impact on performance and the costs associated with increasing gestation feed allowance to sows classified as thin body condition.**

E. K. Weber^{1*}, J. A. Calderón Diaz², K. J. Stalder², M. A. FitzSimmons³, G. Gourley⁴, ¹*Gourley Premium Pork LC, Long Prairie, MN*, ²*Iowa State University, Ames*, ³*MAF Veterinary Services, Mapleton, MN*, ⁴*Gourley Research Group LLC, Webster City, IA*.

The objective of this study was to determine if increased daily feed allowance during gestation leads to increased weight gain, feed costs, and improved body condition of sows. Fifty-six sows classified as thin body condition (BCS = 2.2 ± 0.07) were randomly allotted by gestation week (wk 5 to 10) and parity (2 to 4; 3.7 ± 0.09) to 1 of 2 daily feed allowance treatments (3.2 vs. 4.5 kg). Additionally, 24 sows (BCS = 3.4 ± 0.08 ; parity = 3.6 ± 0.11) considered to be in “ideal” body condition were fed 3.2 kg of feed daily and served as controls. Feed was pre-weighed and delivered to sows individually and remaining feed weights were estimated daily. Sows were individually weighed and BCS evaluated at the start (d 0) and end of study (d 30). Two experienced herds people visually scored BCS on a scale of 1 to 5 on sows individually. Data were analyzed using the MIXED procedure of SAS, with sow as the experimental unit and fixed effects of daily feed allowance and gestation week. Body weight at d 0 was included as a continuous variable. For all sows, BCS improved over the 30 d period (control = 3.68, 4.5 kg/d = 2.94, 3.2 kg/d = 2.91) with the control sows maintaining a significantly higher ($P < 0.0001$) BCS when compared with sows that were classified thin at d 0. Overall sows fed 4.5 kg of feed daily had greater BW gain (36.9 vs. 27.7 kg; $P = 0.0006$) when compared with sows initially classified as thin body condition that were fed 3.2 kg daily. Furthermore, when economically evaluating the treatments, the cost per kg of gain was not significantly different (\$1.08 vs. \$1.09/kg gain) when feeding either 3.2 or 4.5 kg/d to sows classified as thin. However, sows on the 4.5 kg/d treatment had the greatest total feed cost per sow when compared with sows from the control group and treatment sows that were fed 3.2 kg daily (\$37.36, \$25.22, and \$26.43, respectively; $P < 0.0001$). In conclusion, increasing daily feed allowance for sows classified with a thin BCS during gestation improved gain and BCS, while not significantly increasing the feed cost per kg of gain for these animals over the 30 d trial.

Key Words: body condition, gestation feed, sows

147 **Feeding an activated animal protein improves sow and offspring performance.** R. E. Musser^{*}, R. Song, K. W. Purser, C. D. Hagen, *NUTRIQUEST, Mason City, IA*.

This experiment evaluated the effects of feeding an activated animal protein (betaGRO™) on reproductive performance of sows and growth performance of their piglets. A total of