209 Effect of basal diet formulation and wheat bran inclusion on growth performance and carcass characteristics of finishing pigs.. D. M. Sholly*, M. C. Walsh, R. B. Hinson, K. L. Saddoris, L. M. Wilson, A. L. Yager, B. T. Richert, and A. L. Sutton, *Purdue University*.

Three hundred-thirty six pigs (initial BW = 67.5 kg) were used to determine the effects of basal diet formulation (BD) and wheat bran (WB) inclusion rate on growth performance and carcass characteristics. Pigs were blocked by BW, sex, and barn (7 mixed sex pigs/pen; 3 pens/treatment/barn) and randomly allotted to one of 8 diets arranged in a 2 X 4 factorial design with two basal diet formulations (standard corn-SBM meal diet; CTRL, and a reduced nutrient excretion diet; LNE) and 4 levels of WB (0, 5, 10, or 15%). The LNE diet contained low phytic acid corn, 300 U/kg phytase, synthetic amino acids balanced to NRC ratios, and added dietary fat to maintain ME/kg. Bi-weekly BWs and pen feed intakes were recorded and diets were fed in two phases, Finisher 1 (F1; d 0-27) and Finisher 2 (F2; d 27-55). ADG, ADFI, and G:F were unaffected by BD formulations, except during F2 when ADFI was lower for the LNE diet compared to the CTRL ($P<0.05$). As WB inclusion increased, F1 ADG and ADFI decreased linearly ($P<0.01$) and F1 and F2 G:F improved up to 5% and 10% inclusion, respectively, and then declined (quadratic; $P<0.03$). There was an interaction of BD and WB for F2 ADG ($P<0.05$), with ADG increasing up to 5% WB and then decreasing with further increases in WB. The magnitude of this response was more pronounced in the CTRL diets than in LNE diets. Overall, ADFI linearly decreased ($P<0.02$); ADG (779, 784, 777, 730 g/d, WB 0-15%, respectively), G:F (.311, .322, .323, .307, WB 0-15%, respectively), and final BW increased and then decreased as WB inclusion increased (quadratic; $P<0.01$). Last rib and 10^{th} rib backfat (TRBF) linearly decreased as WB inclusion increased from 0 to 15% ($P<0.02$). The LNE formulation tended to increase ultrasound TRBF depths ($P<0.06$), carcass loin depth ($P<0.08$), and carcass yield ($P<0.10$) compared to the CTRL diets. Inclusions of WB up to 5% of the diet improved pig ADG and G:F, however, including 15% WB in finisher diets decreased growth performance.

Key Words: Pigs, Crude Protein, Wheat Bran

210 Influence of Carnichrome® on energy balance of gestating sows. M. G. Young*[1], M. D. Tokach[1], J. Noblet[2], F. X. Aherne[3], S. S. Dritz[1], R. D. Goodband[1], J. L. Nelssen[1], J. van Milgen[2], and J. C. Woodworth[4], [1]*Kansas State University,* [2]*INRA, France,* [3]*Alberta Pig Company,* [4]*Lonza, Inc.*

Twelve multiparous sows with an average initial weight of 182 kg were utilized in a randomized complete block design to determine the effects of feeding Carnichrome®(r) (50 ppm carnitine and 200 ppb chromium picolinate/kg feed) on the energy and nitrogen utilization in early-, mid- and late-gestation. All sows were fed a diet either with or without Carnichrome®(r) for the 28 d lactation, the weaning-to-estrus period, and for the duration of gestation. Daily feeding allowances were based on calculated energy and nutrient requirements to achieve a target sow maternal weight gain of 20 kg and remained constant throughout gestation. The kinetics of heat production (HP) and its partitioning (activity HP) were determined in early- (wk 5 or 6), mid- (wk 9 or 10) and late- (wk 14 or 15) pregnancy using indirect calorimetry. Net maternal weight gain and total number of fetuses averaged 21.6 kg and 16.5, respectively. Organic matter and energy digestibility for the Carnichrome®(r) diet was greater ($P < 0.05$), which resulted in greater DE and ME contents ($P < 0.05$) compared with the control diet. Carnichrome®(r) had no effect on total HP, energy retained as protein or lipid and maternal energy retention in early-, mid- or late-gestation. There was no interaction between Carnichrome®(r) and stage of gestation. Increased energy requirements in late gestation led to a linear increase in HP (4.0 kJ/kg $BW^{0.75}$/d) from d-90 to 110. Energy requirements for maintenance averaged 405 kJ/kg$BW^{0.75}$/d. On average, activity HP was 116 kJ/kg$BW^{0.75}$/d, which was equivalent to 20% of ME intake, but ranged from 11 to 37%. This shows that physical activity represents a major factor causing differences in energy balance between sows. In conclusion, Carnichrome®(r) had no effect on the components of heat production and maternal weight gain during gestation, although it improved energy and organic matter digestibility of the diet.

Key Words: Sows, Carnichrome®, Gestation

211 Effect of feeding protected n-3 polyunsaturated fatty acids (Fertilium™) on litter size in gilts. J. D. Spencer*, L. Wilson, S. K. Webel, R. L. Moser, and D. M. Webel, *United Feeds, Inc.*

The number of pigs farrowed by gilts (PIC C-22) fed a diet containing protected n-3 polyunsaturated fatty acids (PFA, Fertilium™, United Feeds, Inc. Sheridan, IN) prior to first breeding was evaluated. A total of 317 gilts, in six replicate groups, were randomly assigned to one of two experimental treatments at approximately 180 d of age. Treatments consisted of either a control, corn-soybean meal based diet or the control diet containing 1.5% PFA at the expense of corn and soybean meal. Dietary treatments were provided ad libitum 30 d or more prior to breeding. Subsequent litter size is shown in the following table. The litter size was increased by 1 pig ($P \leq 0.01$) at the subsequent farrowing for gilts fed PFA compared to controls. Additionally, individual piglet birth weights were collected from litters within one replicate (n = 21 litters/treatment). Associated with the increase in litter size, the average piglet BW was lower (1.42 vs 1.37 kg/pig; $P \leq 0.05$) for the PFA supplemented group. However, the proportion of low birth weight piglets was similar between treatments (23 vs 24 %; $P \geq 0.10$ for control and PFA, respectively). These data demonstrate an increase in litter size when gilts are fed PFA 30 d or more prior to breeding, and yet do not reflect an increase in number of low birth weight piglets.

Effect of PFA fed to gilts for 30 d or more prior to first breeding

Response	Control	PFA
Total Born	$11.0^{a} \pm 0.22$	$12.1^{b} \pm 0.27$
Live Born	$10.4^{a} \pm 0.23$	$11.4^{b} \pm 0.27$

[a,b] Means within row lacking common superscripts are significantly different ($P<0.01$).

Key Words: Polyunsaturated Fatty Acids, Litter Size, Gilts

212 Effect of feeding duration of protected n-3 polyunsaturated fatty acids (Fertilium™) on litter size and embryo survival in sows. S. K. Webel*, E. R. Otto-Tice, R. L. Moser, and D. E. Orr, Jr., *United Feeds, Inc.*

The effect of feeding duration of a protected n-3 polyunsaturated fatty acid source (PFA, Fertilium™, United Feeds, Inc. Sheridan, IN) on subsequent sow reproductive performance was evaluated. Primiparous and multiparous sows were randomly allotted by parity to a three treatment, randomized complete block design at two research farms. Sows were allotted to treatment at 102 d of gestation, weaned after 16 ± 1 d lactation, then mated at first estrus. Dietary treatments were 1) control, 2) PFA fed from entry into farrowing room until bred, and 3) PFA fed from 8 d prior to entry into farrowing room until bred. Corn-soybean meal based diets served as control treatment. All PFA treated sows received control diets supplemented with 85 g PFA daily. The results for subsequent reproductive performance are presented in the following table. The number of total and live born pigs was 0.7 pigs greater ($P \leq 0.05$) at the subsequent farrowing for sows fed PFA during late gestation, lactation, and rebreeding compared to sows fed either control or PFA during lactation and rebreeding. Wean to estrus intervals and farrowing rates were not different ($P \geq 0.10$) between treatments. A second trial compared the effects of feeding PFA for the entire previous gestation, lactation, and subsequent rebreeding cycle on embryo survival. Sows (n=36) were sacrificed to determine CL and embryo numbers at 30 + 5 d post breeding. The number of CL for control and PFA treated sows were 20.1 and 20.3, respectively ($P=0.85$). Live embryos for control and treated sows were 11.9 and 14.5, respectively ($P=0.04$). These results suggest that dietary supplementation of PFA for 35 or more days prior to breeding increases litter size by improving early embryo survival rather than increasing ovulation rate.

Treatment	Control	PFA at entry	PFA-8d entry	SEM
Sows Allotted	223	232	209	
Sows Farrowed	142	157	135	
Total Born	11.3^{a}	11.4^{a}	12.0^{b}	0.26
Live Born	10.2^{a}	10.2^{a}	10.9^{b}	0.25

[a,b] Means within row lacking common superscripts are significantly different $P<0.05$.

Key Words: Polyunsaturated Fatty Acids, Litter Size, Embryo Survival