fat in Period 1 reduced (P < 0.05) ADFI and tended (P = 0.08) to improve G:F in Period 2. In addition, feeding 6% compared to 0% added fat in Period 2 improved (P < 0.01) ADG and G:F and reduced (P < 0.001) ADFI. In conclusion, adding fat to the diet improved growth rate in the second period only and there was a suggestion of a carryover effect of dietary fat level between periods that merits further study. Also, DDGS can be included at up to 30% of the diet of growing pigs without detrimentally affecting growth performance.

Key Words: DDGS, Fat, Pigs

201 Evaluation of an optimum fat level for early and late finishing pigs. P. Srichana*[1], A. M. Gaines[1], B. W. Ratliff[1], G. L. Allee[1], and J. L. Usry[2], [1]*University of Missouri*, [2]*Ajinomoto Heartland LLC.*

Three experiments were conducted at a commercial research site in order to evaluate the optimum fat level for early and late finishing pigs. In Exp. 1, a total of 1,365 gilts (TR-4 × C22; 51.09 ± 0.15 kg) were used in a completely randomized block design with 13 replicate pens/treatment. In Exp. 2, a total of 853 barrows (TR-4 × C22; 72.24 ± 0.19 kg) were used in a completely randomized block design with 8 replicate pens/treatment. In Exp. 3, a total of 871 gilts (TR-4 × C22; 69.34 ± 0.23 kg) were used in a completely randomized block design with 8 replicate pens/treatment. Pigs used in Exp. 1, 2, and 3 were allotted to one of five dietary treatments containing 0.0, 1.5, 3.0, 4.5 and 6.0% supplemental fat (choice white grease), respectively. Diets were formulated at a lysine:calorie ratio of 2.74 (Exp. 1) and 2.26 (Exp. 2 and 3) g true ileal digestible lysine/Mcal ME. In Exp. 1, fat supplementation increased (linear, P < 0.001) ADG (930, 930, 939, 957, and 971 g/d), decreased (linear, P = 0.02) ADFI (2,413, 2,377, 2,368, 2,359 and 2,341 g/d) and improved (linear, P < 0.001) G/F (0.386, 0.391, 0.398, 0.406, and 0.416). In Exp. 2, fat supplementation increased (linear, P < 0.01) ADG (1,102, 1,098, 1,111, 1,111, and 1,148 g/d), decreased (linear, P < 0.01; quadratic, P = 0.06) ADFI (3,447, 3,361, 3,316, 3,311, and 3,316 g/d) and improved (linear, P < 0.001) G/F (0.320, 0.327, 0.336, 0.337, and 0.346). In Exp. 3, fat supplementation increased (linear, P < 0.01) ADG (1,084, 1,107, 1,125, 1,152, and 1,143 g/d), and improved (linear, P < 0.001) G/F (0.351, 0.364, 0.374, 0.380, and 0.379). These data indicate that increasing the energy density of finishing pig diets results in linear improvements in growth performance. Based on linear regression analysis, for each one percentage unit increase in supplemental fat addition there are 0.78% and 1.30% improvements in ADG (r^2 = 0.91) and G/F (r^2 = 0.98), respectively, in early finishing pigs. Similarly, in late finishing pigs there are 0.80% and 1.29% improvements in ADG (r^2 = 0.99) and G/F (r^2 = 0.95), respectively.

Key Words: Pigs, Fat, Energy

202 Effect of sorting and added fat level on performance of grow-finish pigs reared in a commercial facility. C. W. Hastad*, M. D. Tokach, J. L. Nelssen, S. S. Dritz, R. D. Goodband, J. M. DeRouchey, C. L. Jones, and N. Z. Frantz, *Kansas State University.*

A total of 1,032 pigs were individually weighed, fitted with electronic ear tags and sorted into ten, 2.25 kg BW categories. Pigs were then allotted to pens lighter and heavier then the barn mean or remixed to create a normal distribution around the mean. The initial weight was 26.8, 34.7, and 30.7 kg for light, heavy, and mixed pens, respectively. To complete the 2 3 factorial, pigs were fed corn-soybean meal diets with or without 6% choice white grease. Diets maintained equal lysine to calorie ratios. For the overall 109 d trial, there were no fat initial sort category interactions (P>0.15). Pigs fed 6% added fat tended (P<0.07) to have higher ADG (803 vs 785 g), had lower ADFI (P<0.01; 1.92 vs 2.08 kg), and improved G:F (P<0.01; 0.42 vs 0.38) compared with those fed no added fat. For initial sort category, regardless of diet, heavy pigs grew faster (P<0.01, 0.83, 0.76, and 0.79) and consumed more feed (P<0.01, 2.15, 1.88, and 1.99) than either the light or mixed pigs, respectively; however, light pigs were more efficient (P<0.01, 0.41, 0.39, and 0.40) than either heavy or mixed pigs. Adding fat to the diet did not affect backfat, fat-free lean, % lean, or loin depth. Initial sort category did not affect fat-free lean, % lean, or loin depth; however, light pigs had decreased backfat (P<0.04) compared with heavy or mixed pigs. Although growth and carcass data did not show interactions, differences in the financial response were evident in margin over feed cost (MOF). Heavy pigs had a higher (P<0.01) MOF than either light or mixed pigs ($106.86, $98.64,

and $102.36). When comparing 0 and 6% added fat within initial sort category, adding 6% dietary fat decreased MOF for heavy ($107.90 vs $105.81) and mixed ($102.75 vs $101.97) pigs, but increased MOF for light pigs ($98.04 vs $99.23). This study indicates that the economics of dietary energy density may depend on weight category; however, more research is needed to verify this response.

Key Words: Dietary fat, Variation, Finishing pigs

203 Pig feed intake correction calculator using a Microsoft Excel macro. M. D. Lindemann and B. G. Kim*, *University of Kentucky.*

In most animal growth experiments, more than one animal is housed per pen. Occasionally, one animal shows a very different growth rate than its pen mates or even dies during the experiment. When this happens, if pen feed intake cannot be re-estimated for the calculation of average daily feed intake and feed conversion ratio, an observation will be lost from the data set. Because calculation of individual feed intake is relatively complicated, we developed a simple calculator for feed intake correction using a Microsoft Excel macro. The feed intake of each affected pen is partitioned into feed intake for maintenance and feed intake for growth for each animal within that pen. First, individual pig maintenance feed intake for the period is calculated using the NRC (1998) estimation of ME for maintenance. The equation is: Maintenance feed intake (kg) = 106 x (((Initial weight (kg) + Final weight (kg)) / 2)$^{0.75}$) x feeding days / ME per kg feed. Then, maintenance feed intake for all pigs in the pen is summed. The difference between this sum and the total pen feed intake is that which supported growth in the pen. Next, individual feed intake for growth is calculated by apportioning the remaining feed equally to each kg of gain within the pen. Finally, the estimated individual feed intake for the pig being removed from the pen is the sum of maintenance feed intake and growth feed intake for that pig; this feed intake estimate is subtracted from the original pen feed intake to leave the new pen feed intake for the remaining pigs. All the calculation procedures are included within the Excel macro. Potential error warnings are included in the macro to avoid accidental selection of the wrong pig for exclusion. An outlier confirmation procedure, which shows the difference of the outliers' growth from its pen mates, is also included in the macro. The current feed intake correction calculator is designed for swine growth research; however, it is also applicable for poultry and rodent growth trials with modifications to the energy requirement for maintenance value and the exponent for metabolic BW.

Key Words: Feed intake, Excel, Pigs

204 Effects of dietary organic and inorganic trace minerals at NRC or elevated levels on sow reproductive performance over four parities. J. C. Peters* and D. C. Mahan, *The Ohio State University.*

The effects of trace mineral source and levels on sow reproductive performance was evaluated over four parities using 102 sows and 287 farrowings. The experiment was a 2 x 2 + 2 factorial, conducted in a Split-plot design with repeated measures. The first factor evaluated organic (Bio-Plex, Alltech Inc.) and inorganic sources of trace minerals (Cr, Cu, Fe, Mn, Se, and Zn) fed to developing gilts and sows. The second factor evaluated dietary mineral levels, with one level meeting NRC (1998) standards (NRC) and the second set at normal industry standards (IND, range of 150 to 240% increase). Gilts were initially fed one of the four dietary treatments at 30 kg BW. From breeding through parity four, two treatments added higher levels of Ca and P to the IND level (IND+CaP) for both mineral sources. Litters were equalized within 3 d postpartum. Gestation weight gains (P < 0.01) and backfat thicknesses (P < 0.01) were greater when sows were fed the NRC vs. the IND level. Sows fed the organic trace mineral source tended to farrow more total (P = 0.06) pigs (12.3 vs. 11.5) with heavier (P < 0.15) litter (19.5 vs. 18.6 kg) but not individual pig weights at birth. Litter daily gains from birth to weaning were greater when sows were fed the organic source (P < 0.05). Number of pigs born (total and live) was greater (P < 0.01) for sows fed the NRC vs. the IND and IND+CaP levels for both sources. Litter gains during the lactation period were greater when the NRC vs. the IND level was fed (P < 0.05). Sow lactation feed intake, litter size at birth, and litter growth rates increased linearly (P < 0.01) as parity advanced. No interactions (P > 0.15) occurred between trace mineral source and dietary level or between parity and dietary treatments. These