103 Relationship between dietary fat and fatty acid composition in backfat of boars and gilts. E. Hallenstvedt*[1,2], H. Sterten[1,2], and M. Øverland[1], [1]*University of Life Sciences*, *Ås, Norway*, [2]*Felleskjøpet Forutvikling*, *Trondheim, Norway*.

The objective of this study was to investigate the effect of dietary fat sources and sex on fatty acid composition of backfat in cross bred pigs (LY x DD). The experiment comprised 36 boars and 36 gilts (30 kg and 110 kg initial and final BW) from nine litters. Pigs were allotted according to litter, sex and initial weight in a randomized block design. Pigs were limit-fed individually; thus, each pig was an experimental unit. The dietary treatments were barley - soybean meal based and contained either no added fat (control), 6% soybean oil (SO) or 3% SO and 3% fish oil (SO/FO). Samples of the inner and outer layer of the backfat were collected at the P2-location of each pig and analyzed for fatty acid composition. The results showed that dietary fatty acid composition had significant impact on fatty acid composition of backfat. No significant interaction was found between diets and sex for any parameters measured. Pigs fed the low fat control had significantly higher content of saturated fatty acids (SFA) and monounsaturated fatty acids (MUFA) than pigs fed the SO or SO/FO diets. The content of polyunsaturated fatty acids (PUFA) was higher in pigs fed the SO diet compared to pigs fed the control and SO/FO diet. The n-6/n-3 ratio was on average 50% lower in pigs fed the SO/FO diet than pigs fed control or SO diet. Backfat from boars had a significantly higher level of PUFA than backfat from gilts. The results showed a significantly higher level of SFA and significantly lower levels of both MUFA and PUFA in the inner than the outer layer of backfat. In conclusion, the addition of SO and SO/FO to diets increased the level of PUFA, but decreased the level of MUFA and SFA in the backfat. Furthermore, the SO/FO diets resulted in the lowest n-6/n-3 ratio. Boars had a higher level of PUFA in the backfat, but both sexes reacted similarly to the dietary treatments.

Key Words: Pigs, Dietary fat, Fatty acid composition

Nonruminant Nutrition - Additives and Gut Modifiers

106 Influence of L-carnitine on gilt and fetal growth characteristics at three gestation lengths. K. R. Brown*[1], R. D. Goodband[1], M. D. Tokach[1], S. S. Dritz[1], J. L. Nelssen[1], J. E. Minton[1], J. C. Woodworth[2], and B. J. Johnson[1], [1]*Kansas State University*, *Manhattan*, [2]*Lonza, Inc., Allendale, NJ.*, *Allendale, NJ.*

Gestating gilts (n=59; BW=137.7 kg) were used to determine the effects of dietary L-carnitine on gilt and fetal growth characteristics at d 40, 55, and 70 of gestation. Gilts were fed a gestation diet once daily (1.75 kg) with a 50-g top dress containing either 0 (control, n=30) or 88 mg (50 ppm) of L-carnitine (Carn, n=29) from breeding through d 40, 55, or 70, at which time gilt BW, backfat, and blood collection occurred and fetuses were collected for fetal trait measurements. No differences between treatments were observed for BW or estimated protein or fat mass at any gestation length, but gilts fed Carn were numerically heavier (170.3 vs. 166.2 kg) than control gilts on d 70. Gilts fed Carn tended to have greater (P=0.10) backfat at d 40 gestation. Insulin-like growth factor I (IGF-I) concentrations decreased (P<0.01) from d 0 to 70 for all gilts with no differences between treatments. At breeding, no differences were observed in circulating total and free Carn, but were increased (P<0.01) on d 40, 55, and 70 for gilts supplemented Carn. Total litter size, total litter weight, fetal number in the right (R) and left (L) uterine horn, crown to rump length (CRL) of the fetuses and total number of corpus lutea did not differ among treatment within gestational length. Total litter weight, average fetal weight, CRL, and fetal IGF-II increased (P<0.05), but total fetal number and fetal number in the R and L uterine horn decreased (P<0.05) as gestational length increased. Fetuses from gilts fed Carn tended to be heavier (P=0.06) at d 70 than fetuses from control gilts (236.6 vs. 217.7 g) and fetal IGF-II was lower (P=0.09) at d 70 in gilts fed Carn compared with control gilts (17.6 vs. 22.9 ng/mL). These results indicate that L-carnitine supplementation to gestating gilts has beneficial effects on average fetal weight, due in part to changes in the IGF system.

Key Words: Carnitine, Gilt, Growth

107 Leukocyte proportions and interferon-Γ concentration in colostrum and milk of lactating sows supplemented with mannan oligosaccharides during gestation and lactation. C. L. Bradley*[1], M. E. Davis[1], D. C. Brown[1], C. V. Maxwell[1], Z. B. Johnson[1], R. Musser[2], and R. Dvorak[3], [1]*University of Arkansas*, *Fayetteville,*, [2]*Hubbard Feeds, Inc.*, *Mankato, MN*, [3]*Alltech, Inc.*, *Nicholasville, KY.*

Thirty-six gestating sows were randomly assigned to two dietary treatments to determine the effects of mannan oligosaccharide supplementation (MOS) on immune cell populations and interferon-Γ (IFN-Γ) concentration of colostrum and milk. Sows were fed a control (CTL) or MOS-supplemented diet three weeks prior to farrowing and throughout lactation. Colostrum samples were obtained at the onset of farrowing and milk samples were obtained approximately 14 d later. Leukocyte proportions were determined by flow cytometric analysis and IFN-Γ concentrations were measured by ELISA in colostrum and milk fluid. Proportions of TCRΓΔ+CD8+CD4- cells tended to be greater in colostrum when compared to milk from MOS sows, but was similar in CTL sows (Trt x milk type interaction, P = 0.08). Proportions of CD8-CD4+TCRΓΔ+ cells were greater in milk when compared to colostrum from MOS sows, but was similar in CTL sows (Trt x milk type interaction, P = 0.05). Activated cytotoxic T cells (CD8+CD4-CD25+) were greater in milk when compared to colostrum from CTL sows, but was similar for MOS sows (Trt x milk type interaction, P = 0.05). Proportions of macrophages (SWC1+MHCII-) in milk from MOS sows were greater when compared to colostrum from MOS sows and milk from CTL sows (Trt x milk type interaction, P = 0.08). However, proportions of macrophages were greater (P < 0.001) in colostrum when compared to milk from CTL sows, but was similar in colostrum and milk from MOS supplemented sows (Trt x milk type interaction, P = 0.04). Proportions of antigen presenting cells (MHCII+CD14-) cells in colostrum of CTL sows was greater (P = 0.02) when compared to milk, but was similar in the colostrum and milk from MOS supplemented sows (Trt x milk type interactions, P = 0.02). Interferon-Γ concentration tended to be greater (P < 0.10) in colostrum when compared to milk in MOS supplemented sows. These results indicate that MOS supple-