High prolificacy and increased fetal survival is associated with reduced uterine space. The aim of the study was to determine the impact of intrauterine crowding (IUC) using unilaterally hysterectomized-ovariectomized gilts (UHO), on organ and muscle development of the progeny at birth. In the study 7 UHO and 7 intact (C) Swiss Large White gilts were used. At farrowing 3 male and 3 female progeny with a low (< 0.8 and < 1.2 kg), high (> 1.6 kg) and medium (> 1.3 and < 1.5 kg) birth weight (BiWt) were sacrificed. Subsequently, internal organs, the semitendinosus (ST) and psoas major (M) were collected and weighed. Histological analyses were performed on the dark portion of the ST (STD) and the PM using aATPase staining after pre-incubation at pH 10.2. Myosin heavy chain (MyHC) polymorphism was determined in the PM using SDS-PAGE gel electrophoresis. Litter size was reduced (P < 0.01) by 35% and UHO-progeny tended (P = 0.06) to be lighter than C-progeny. Average BiWt from the selected piglets did not (P = 0.17) differ among the experimental groups whereas PM and kidneys tended to be lighter (P < 0.07) in UHO- than C-progeny. Compared to C-progeny, the PM and the STD of UHO-progeny had fewer (P ≤ 0.05) secondary and total myofibers as well as numerically fewer (P ≤ 0.15) primary myofibers. The relative abundance of fetal MyHC was lower (P = 0.02) and that of type 1 MyHC was greater (P = 0.09) in piglets from UHO- compared to C-gilts. With increasing BiWt, organ and brain weights increased (P < 0.01). By contrast myofiber hyperplasia was not (P > 0.19) affected by the BiWt. Female progeny had fewer (P < 0.08) primary and secondary myofibers in both muscles than male progeny. In conclusion, regardless of BiWt IUC resulted in decreased weight of the kidney and PM and reduced muscle hyperplasia. The latter might ultimately impair postnatal growth and carcass characteristics.

Key Words: myogenesis, intra uterine crowding, pig

118 Effects of piglet birth weight and litter size on pre-weaning growth performance of pigs on a commercial farm. J. R. Bergstrom1, M. L. Potter1, M. D. Tokach1, S. C. Henry2, S. S. Dritz1, J. L. Nelssen1, R. D. Goodband1, and J. M. DeRouchey1, 1Kansas State University, Manhattan, 2Abilene Animal Hospital, Abilene, KS.

A total of 2,204 pigs (from 195 PIC-327 sired litters) were used to evaluate the effects of birth wt and gender (barrow or gilt) on pig performance and carcass characteristics. For 22-d, all pigs born alive were identified at birth with a numbered ear-tag, and dam, gender, and birth wt were recorded. Pigs were weaned at approximately 25 d of age. All pigs were weighed at weaning (d 0) and on d 22, 44, 74, and 156. Carcass data were obtained from a subsample of 420 pigs harvested on d 167. For data analysis, individual birth wt was used to assign pigs to 7 birth wt categories (<1.2, 1.2 to 1.4, 1.4 to 1.5, 1.5 to 1.7, 1.7 to 1.8, 1.8 to 2.0, >2.0 kg). Therefore, data were analyzed as a 2 x 7 factorial to determine the effects of gender and birth wt category. Individual pig was the experimental unit, and dam, nursery room, and finisher room were used as random effects with weaning age as a covariate. As birth wt category increased, ADG and BW increased (P < 0.01) during all periods and overall (656, 702, 725, 732, 751, 766, and 771 g/d post-weaning; and 108, 117, 120, 122, 125, 128, and 129 kg final BW). Percentage of cull and light wt pigs at market (18, 11, 5, 7, 3, 2, and 2%) was also reduced (P < 0.001) as birth wt category increased. Although HCW (89, 93, 95, 96, 95, and 98 kg) increased (P < 0.001) with increasing birth wt category, there were no differences in backfat depth (18 mm), loin depth (5.7 cm), and fat-free-lean (52%). Overall, post-weaning ADG (760 vs. 698 g/d), final BW (126 vs. 117 kg), HCW (98 vs. 91 kg), and backfat depth (20 vs. 16 mm) of barrows were increased (P < 0.001) compared to gilts; but the percent culls and pigs <75.5 kg (5 vs. 9%) and fat-free-lean (50.9 vs. 55.2%) were reduced (P < 0.001) compared to gilts. Post-weaning mortality was not affected (P > 0.57) by birth wt category or gender. In summary, piglet birth wt and gender influence growth, and should be considered when identifying methods to optimize overall performance.

Key Words: birth weight, gender, growth