117 In pigs myofiber hyperplasia is reduced due to intrauterine crowding. J. Bérard[1,2], C. E. Pardo[1,2], S. Béthaz[1], M. Kreuzer[2], and G. Bee*[1], [1]*Agroscope Liebefeld Posieux, Research Station ALP, Posieux, Switzerland*, [2]*Department of Agricultural and Food Science, ETH-Zurich, Zurich, Switzerland*.

High prolificacy and increased fetal survival is associated with reduced uterine space. The aim of the study was to determine the impact of intra uterine 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 (BtW) 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 mATPase 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 BtW 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 ($P \leq 0.05$) secondary and total myofibers as well as numerically fewer ($P \leq 0.15$) primary myofibers. The relative abundance of fetal MyHC was lower ($P = 0.02$) and that of type I MyHC was greater ($P = 0.09$) in piglets from UHO- compared to C-gilts. With increasing BtW, organ and brain weights increased ($P < 0.01$). By contrast myofiber hyperplasia was not ($P > 0.19$) affected by the BtW. Female progeny had fewer ($P < 0.08$) primary and secondary myofibers in both muscles than male progeny. In conclusion, regardless of the BtW 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. Bergstrom*[1], M. L. Potter[1], M. D. Tokach[1], S. C. Henry[2], S. S. Dritz[1], J. L. Nelssen[1], R. D. Goodband[1], and J. M. DeRouchey[1], [1]*Kansas State University, Manhattan*, [2]*Abilene Animal Hospital, Abilene, KS.*

A total of 2,204 pigs (from 195 PIC-327 sired litters) were used to evaluate piglet birth weight (BiWt), litter size (LS), and pre-weaning piglet performance. All pigs born live (LB) over 22 d were identified with a numbered ear-tag. Within 18 h of parturition, each sow was assigned a body condition score (BCS), and the number of total born (TB), LB, and born dead (BD), as well as individual piglet gender and BiWt were recorded before movement to equalize LS. Litters were not provided creep feed. At weaning (~25-d of age), pigs were individually weighed and assigned a BCS (1=emaciated, 2=thin, or 3=full-bodied). For data analysis, pigs were grouped into 4 BiWt categories (<1.1, 1.1 to 1.5, 1.6 to 2.0, and >2.0 kg), and 3 TB categories (≤11, 12 to 14, and ≥15). As expected, BiWt (0.9, 1.3, 1.7, and 2.1 kg) was greater ($P < 0.001$) for pigs of heavier BiWt categories. Pigs of heavier BiWt categories were associated ($P < 0.02$) with a decreased number of TB (13.3, 13.1, 13.0, and 12.6) and LB (12.1, 11.9, 11.9, and 11.6). Pre-weaning ADG (172, 224, 248, and 267 g/d), weaning weight (5.2, 7.0, 7.9, and 8.8 kg), weaning BCS (2.69, 2.87, 2.89, and 2.93), and pre-weaning mortality (24, 10, 5, and 5%) were improved ($P < 0.001$) for pigs from heavier BiWt categories. For the 3 TB categories, BiWt (mean of 1.5 kg) was not different. Sow BCS (3.0, 3.0, and 3.1) was higher ($P < 0.001$) for TB category ≥15. Litter LB (8.8, 12.0, and 14.8) and BD (0.6, 1.0, and 1.8) increased ($P < 0.001$) with greater TB categories. Pre-weaning ADG (234, 225, and 225 g/d) and weaning weight (7.4, 7.2, and 7.2 kg) were modestly improved ($P < 0.04$) for pigs from the lowest TB category. These data indicate that low-BiWt pigs had poorer pre-weaning growth and survivability. Although larger litters resulted in more low-BiWt pigs, the number of heavier-BiWt pigs also increased. As litter size increases, emphasis must be directed towards increasing BiWt and performance of low-BiWt pigs.

Key Words: birth weight, litter size, pigs

119 Effects of birth weight and gender on post-weaning performance of pigs in a commercial environment. J. R. Bergstrom*[1], M. L. Potter[1], M. D. Tokach[1], S. C. Henry[2], S. S. Dritz[1], J. L. Nelssen[1], R. D. Goodband[1], and J. M. DeRouchey[1], [1]*Kansas State University, Manhattan*, [2]*Abilene Animal Hospital, Abilene, KS.*

A total of 1,995 pigs (PIC 327 sired) 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 2×7 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 ($P < 0.001$) 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, 95, 96, 96, 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 <97.5 kg (5 vs. 9%) and fat-free lean (50.9 vs. 53.2%) 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