Reproductive performance and longevity in replacement gilts allowed different amounts of floor space during the nursery phase of rearing – NPB #11-118 revised

Title: Reproductive performance and longevity in replacement gilts allowed different amounts of floor space during the nursery phase of rearing

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Scientific Abstract:

The objective was to determine effects of floor space in the nursery on growth, physiology, immunology and organ characteristics of replacement gilts. Gilts (n = 2,537; BW = 5.6 ± 0.6 kg) from 13 groups of weaned pigs were placed in pens of 14, 11 or 8 pigs resulting in floor spaces of 0.15 (high [HI]), 0.19 (normal [NO]), or 0.27 (low [LO]) m²/pig, respectively. Pigs were weighed on d 0 (entry) and d 46 (exit). Blood chemistry and complete blood counts were assessed at d 6 and 43 for a subsample of gilts (n = 18/treatment) within a single group. The ADG was affected by treatment (P < 0.01) and was greater (P = 0.01) for LO (0.465 ± 0.005 kg/d) than NO (0.446 ± 0.005 kg/d). The NO gilts tended (P = 0.06) to have greater ADG than HI (0.432 ± 0.005 kg/d). There were many main and interactive effects of treatment, size and day on blood response variables. For example, blood calcium was affected by treatment (P = 0.02) and was greater (P = 0.04) for LO (10.43 ± 0.07 mg/dL) and NO (10.45 ± 0.07 mg/dL) than HI (10.19 ± 0.07 mg/dL). Globulin tended to be affected by treatment x day (P = 0.07) and increased (P = 0.07) from d 6 to 43 in HI (2.07 to 2.55 ± 0.08 g/dL) but not LO or NO. Creatine kinase was affected by treatment x day (P = 0.03) and increased (P = 0.03) with time in LO (732.17 to 1774.78 ± 194.35 U/L) but not NO or HI. Chloride was affected by treatment x day (P = 0.02) and increased with time for LO (99.94 to 102.11 ± 0.45 mEq/L; P = 0.03) and NO (99.39 to 101.67 ± 0.45 mEq/L; P = 0.02), but not HI. Reticulocyte numbers tended to be affected by treatment x day (P = 0.07) and on d 46 were greater (P = 0.07) in LO (289.45 ± 11.09 x10⁹/L) compared to NO (229.80 ± 11.09 x10⁹/L) and HI (240.07 ± 11.09 x10⁹/L). A subset of 30 gilts (n = 10 per floor space treatment) were killed and characteristics of organs determined. At harvest, there was a linear effect of floor space (P < 0.05) for BW (33.7, 31.8, and 30.4 kg [SE = 1.1 kg] for gilts allowed 0.27, 0.19, or 0.15 m²/pig, respectively). There was an interaction of size and floor space (P < 0.01) for liver weight; Liver weights decreased for large pigs as space allowance was decreased (1330.1, 1093.6, and 1016.7 g [SE = 59.8 g] for gilts allowed 0.27, 0.19, or 0.15 m²/pig, respectively). There was a linear effect of floor space (P < 0.01) for spleen weight, and weights were 79.8, 68.9, and 64.7 g (SE = 4.0 kg) for gilts allowed 0.27, 0.19, or 0.15 m²/pig, respectively. Kidney and heart weights were not affected by floor space or the interaction of size and floor space (P > 0.1). For reproductive organs, weights of the uterus and ovaries, and length and area of the vulva were not affected by floor space, or the interaction of size and floor space (P > 0.1), however, the width of the vulva tended (P < 0.07) to decrease linearly with decreasing floor space. Greater space allowance in the nursery increased ADG and affected blood parameters in replacement gilts. Further study will determine if these effects influence future reproduction and sow longevity.

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