

of the animals during the inhalation of CO₂. It can be concluded that, in a nonstressful a.m. treatment, the supplementation with elemental

Mg or Trp did not affect the meat quality parameters, the genetic of the animals being the most influential factor.

Key Words: Magnesium, Tryptophan, Pork quality

Swine Species

T58 Additional heat behind farrowing sows to reduce the number of stillborn piglets. Y. Gao, H. Y. Zhang, B. Szkotnicki, and R. R. Hacker*, *University of Guelph, Guelph, ON, Canada.*

Additional heat behind a sow at farrowing might help rendering a more relaxed labor in the sow and reduce the number of stillborn pigs at parturition. To examine the hypothesized heat effect, two trials were conducted. Parturient sows were moved to farrowing crates by day 109 of gestation, and fed a 14 (in trial I) or a 16% (in trial II) CP corn-soybean meal diet (3.2-5.5 kg) twice daily. The farrowing room was maintained at 21°C or above and the creep zone was maintained above 35°C with a 175W IR heat lamp. In total, 294 sows (86 Yorkshire in trial I and 208 Hay Bay F1 York/Landrace in trial II) were randomly assigned into either a Heat (an additional 100W IR heat lamp hovered behind the sow at farrowing) or a Non-Heat group. To distinguish stillborn pigs from other pigs that were born alive and died after birth, a lung flotation test was performed on all dead piglets after completion of farrowing. In addition, 20 sows (10 from each group) from trial I were observed for the farrowing behavior. The length of time sows spent sitting, standing and lying down, average delivery interval and position change frequency were recorded. Results showed that additional heat behind a sow at farrowing did not significantly reduce the number of stillborn pigs. On average, there was one stillborn piglet per litter for either the Heat or the Non-Heat group. However, Heat did appear to make live born piglets move readily to the sows udder. Furthermore, there was no difference between the Heat and the No-Heat group for the time farrowing sows spent lying down (85.8 vs. 85.8 min), sitting (9.5 vs. 10.1 min) or standing (4.6 vs. 4.2 min). Additional heat did not significantly decrease the average piglet delivery interval (16.9 min for the Heat group and 17.2 min for the Non-Heat group), however, it significantly decreased ($P < 0.05$) position change frequency (24 vs. 30 times). Less sow movement reduces the risk of the neonatal pigs being crushed by the sow.

Key Words: Additional Heat, Stillborn, Sow Farrowing Behavior

T59 Addition of heat at birth and supplementation of energy and IgG products on improving survivability in neonatal pigs. Y. Gao, H. Y. Zhang, B. Szkotnicki, and R. R. Hacker*, *University of Guelph, Guelph, ON, Canada.*

The objective of this study was to reduce piglet mortality during the first 7d of life by providing additional heat at birth and orally administering cream (C), (10% Half-and-Half cream, Parmalat Canada), and IgG, as Porcine plasma IgG concentrate (P), (American Protein Corp. Inc., IA, USA), to provide supplemental heat, energy and immunoglobulin to neonatal pigs. The farrowing room was maintained at 21°C or above and the creep zone was maintained above 35°C with a 175W IR heat lamp. In two trials, 294 litters (86 litters from Yorkshire sows in trial I and 208 litters from Hay Bay F1 York/Landrace sows in trial II) were randomly assigned into either a Heat (an additional 100W IR

heat lamp hovered behind a sow at farrowing, maintaining the farrowing zone temperature above 30°C) or a Non-Heat group. Within 12h after farrowing, the four smallest (minimum birth body weight of 0.6 kg) newborn piglets were selected from each litter and randomly assigned to one of the following four treatments: Control, C (6ml), CP-1 (7ml, 120mg/ml IgG) and CP-2 (8ml, 210mg/ml IgG) in trial I; Control, C (6ml), CP-3 (6ml, 60mg/ml IgG) and CP-4 (6ml, 120mg/ml IgG) in trial II. Results showed that the addition of heat at birth did not show any significant effect on piglet mortality at birth. There was not a significant effect on 3d or 7d piglet mortality associated with supplementation of energy or IgG to newborn pigs in this study. In addition, there was no difference for piglet weight gain from birth to 7d of life. Further investigations need to be conducted on the transfer and absorption of the supplemented IgG in neonatal pigs.

Key Words: Energy and Immunoglobulin Supplementation, Additional Heat, Piglet Mortality

T60 Effects of stocking rate and feeder space on pig performance in a wean-to-finish system. J. M. DeDecker*¹, M. Ellis¹, B. F. Wolter², and B. A. Peterson¹, ¹*University of Illinois, Urbana,* ²*The Maschhoffs, Inc., Carlyle, IL.*

The objective of this study was to determine the effects of feeder space and stocking rate during the first 8 wk post-weaning on pig performance from weaning (4.8 ± 0.03 kg BW; 15 ± 1d of age) to 23 wk post-weaning. Twenty pens of crossbred pigs (n = 960) were used in a randomized complete block design with a 2 × 2 factorial arrangement of treatments: 1) stocking rate (Single [32 pigs/pen] vs Double [64 pigs/pen]) and 2) feeder space (two spaces [81.3 cm/pen] vs three spaces [121.9 cm/pen]). The stocking rate treatment was imposed for 8 wk post-weaning, thereafter pigs on all treatments had the same group size of 32 pigs/pen. Floor spaces/pig during the treatment period were 0.66 m² and 0.33 m² for the single- and double-stocked treatments, respectively. There were no ($P > 0.05$) stocking rate by feeder space interactions. During the 8 wk double-stocking period, daily weight gain was higher ($P < 0.001$; 494 and 467 ± 4g/d) for the single-stocked pigs resulting in heavier ($P < 0.001$; 32.3 and 30.8 ± 0.23kg) BW at the end of wk 8. Providing three feeding spaces compared to two tended ($P = 0.08$) to improve daily weight gains (485 and 476 ± 4g/d) resulting in a trend ($P = 0.09$) for heavier BW (31.9 and 31.2 ± 0.23kg) at the end of wk 8. From the end of the double-stocking period to slaughter, there was a trend ($P = 0.06$) for average daily gain (839 and 862 ± 7g/d) to be higher for the double-compared to the single-stocked pigs resulting in similar ($P = 0.77$) BW at slaughter. There was no effect of feeder space during this period and BW were similar ($P = 0.71$) at slaughter. In summary, these results suggest double-stocking pigs for 8 wk post weaning reduces growth performance and BW at 8 wk, but that difference is not maintained to slaughter. Adding an additional feeder space did not significantly improve performance of double-stocked pigs in this study.

Key Words: Pigs, Stocking Rate, Feeder Space

Animal Health

T61 Dose-dependent cytokine expression in lipopolysaccharide activated bovine alveolar macrophages. J. A. Mills*, J. E. Campanicki, and R. M. Dyer, *Dept. of Animal and Food Sciences, University of Delaware, Newark.*

Pro- and anti-inflammatory cytokine gene expression in bovine alveolar macrophages could be reflected by level of lipopolysaccharide (LPS) challenge. Lavage procured alveolar macrophages (n=4) were exposed to 0, 1, 10, 100 and 1000 ng/ml of LPS (*E. coli*; O111:B4) for 6 hours. Levels of mRNA expression for IL-1 α , IL-1 β , TNF α , IL-10, IL-12, IL-18, TGF β and iNOS were determined by real time QPCR.

Expression of IL-1 α , IL-1 β and iNOS and peaked at 2.5, 11.3 and 13.0 fold higher ($P < 0.05$) than levels in unexposed cells, respectively at 100 ng/ml of LPS. TNF α expression changed within LPS stimulated alveolar macrophages, but differences between LPS treatments were only significant between 1 ng/ml and 100 ng/ml ($P < 0.05$), and tended to differ between 1 ng/ml and 1000 ng/ml ($P < 0.10$). In contrast, expression of IL-10, IL-12, IL-18 and TGF β decreased ($P < 0.05$) at all levels of LPS exposure with the greatest decrease appearing at 100 and 1000 ng/ml of LPS. These findings suggest the balance of inflammatory and anti-inflammatory cytokine expression is dependent upon levels of LPS