RESEARCH ABSTRACT
ANIMAL SCIENCE

Title: An Integrated approach to improve while herd pig survivability- #19-152 IndPPA

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Scientific Abstract:

Objective 1 (Farrowing induction): Historically, sows have been induced to farrow using prostaglandin followed by an injection of oxytocin 24 hours later. Benefits of induction can include decreased rate of stillbirths, dystocia, and postnatal mortality along with increasing the likelihood of farrowings being attended. Several studies have indicated that oxytocin administration may negatively impact fetal oxygen supply during parturition, potentially from umbilical cords breaking prior to birth, resulting in increased preweaning mortality. Therefore, the objective of this study was to determine if various induction protocols impact umbilical cord breakage and fetal blood parameters at birth. Fifty-eight primiparous and multiparous sows were assigned to one of three treatments: no induction (NO; n= 24), or 2 cc prostaglandin administered on d114 of gestation followed by either 1 cc of oxytocin 24 hours later (OXY24; n=13) or 0.5 cc of oxytocin at 6 and 12 hours after prostaglandin (OXY6; n=21). Details of the farrowing process were recorded, and umbilical cord blood was collected from piglets at birth and evaluated on an iSTAT machine using an Abbott EC8+ test cartridge. There were no differences in total born, number born alive, stillborns, mummies, or assistance needed during farrowing. Induced sows were more likely to farrow by d115 compared to naturally farrowing sows (P=0.02). Sows in the OXY24 treatment tended to have longer farrowings when compared to both NO and OXY6 (4.8 vs 3.6 vs 3.9 hours; P=0.09). Colostrum from OXY6 sows tended to have a greater amount of lactose present than NO and OXY24 (P=0.05). Colostrum from sows with longer gestation lengths had higher percent fat (P=0.03). Piglets born from NO sows had higher base excess, total carbon dioxide, and glucose which suggests that these piglets had prolonged moments of asphyxiation (P<0.01). OXY24 piglets had the lowest blood pH which is indicative of hypoxic birthing conditions (P<0.01). Preweaning mortality was driven largely by a low birth weight coupled with low colostrum intake (P=0.03). All piglets regardless of treatment, displayed signs of stress during farrowing. Induction did not influence preweaning mortality but has the potential to decrease the incidence by increasing attended farrowings.

Objective 2 (Supplemental Heat Management): Heat lamps are extensively used as a heat source for newborn piglets in the swine industry. The assistance to piglets to reach the udder is variable between operations. The objective of this study was to evaluate the effect of the location of the heat lamp (HL) and piglets (PL) at birth on the piglet's suckling behavior, body temperature, growth, and survival. A total of 1053 piglets from 87 litters were used for this study. Litters were blocked by parity and randomly

assigned to one of the four treatments in a 2x2 factorial design, combining the HL and PL at birth. The four treatments were: HLU/PU, HL situated in the sow's udder, and piglets placed at the sow's udder; HLB/PU, HL at the sow's back and piglets atthe udder; HLU/PV, HL at the udder and piglets placed at the sow's vulva; and HLB/PV, HL at the sow's back and piglets at the vulva. After birth, each piglet was weighed and rectal temperature taken. Body temperature was recorded at 30 min, 1h, and 2 h. The time from birth to first approach to the udder and first suckle were recorded. Body weight was recorded at 24h, and weekly until weaning. Piglet mortality and reasoning for death was recorded through weaning. Data was analyzed as a complete factorial with 4 treatments in addition to the effects of HL and PL evaluated separately using PROC MIXED and GLIMMIX in SAS. HLB/PV piglets tended to be colder at 30 min after birth ($P=0.097$) than the other treatments. When the individual effect of PL was analyzed, piglets placed at the sow's vulva had lower temperatures at 30 min ($P=0.019$) than piglets at the udder. The time taken to reach the udder and for the first suckle were greater ($P < 0.001$ and $P=0.019$, respectively) in piglets placed at the vulva. Mortality, colostrum intake, body temperature after 30min, and growth through weaning were not affected by treatment.