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Controlling Aggression Among Gestating Sows
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Aggression at mixing is a major concern for group-housed gestating sows because it negatively impacts sow welfare and performance. There is evidence that aggression is associated with excitement, and suppressing excitement reduces aggression (Luescher et al., 1990). Tryptophan, a precursor of serotonin, suppresses excitement, therefore has reduced aggression in several species such as poultry (Shea et al., 1990), horses (Grimmett and Sillence, 2005), dogs (DeNapoli et al., 2000), and fish (Winberg et al., 2001). In swine, supplementation of dietary tryptophan to grow-finish pigs for two days significantly reduced aggression at mixing (Li et al., 2006). The objective of this study was to determine the effect of the supplementation of tryptophan on controlling, aggression, social stress, and reproductive performance in group-housed gestating sows.

A total of 168 sows in 8 pens (21 sows/pen, parity 1-13), group-housed with electronic sow feeders (ESF) on concrete slatted floors were used. Sows were mixed at weaning after 3 weeks in farrowing crates. The sows were divided into 2 experimental treatments, 4 pens of a control group and 4 pens of a treatment group. The control group received regular diets (NRC requirements) throughout gestation (0.15% tryptophan) and lactation (0.2% tryptophan). Three days before and after mixing, the treatment group received two times the required dietary tryptophan, 0.3% tryptophan in gestation and 0.4% tryptophan in lactation diet. Six focal sows in each pen (Parity 1 = 2, Parity 2 = 2, Parity 3-6 = 2) were designated and videotaped immediately after mixing for 72 hours to determine aggression among the sows. . Before and 48 hours after mixing, saliva samples were taken from the focal sows using the cotton swab method and analyzed for cortisol concentration by radioimmunoassay (Cook et al., 1996). All sows were assessed prior to, and 48 hr after mixing for scratches resulting from aggression using the methodology of Hodgkiss et al. (1998). Performance data, including farrowing rate and litter size at birth were collected on all

sows. Proc Glimmix procedure (fix effect = treatment, random effect = pen) and Proc Freq procedure (Chi-square) of SAS were used to analyze the data.

Supplementation of dietary tryptophan reduced total duration of head to head knocking (4.9 vs. 8.6 sec/sow/h, SE = 0.96; $P < 0.01$), and tended to reduce the frequency of this aggressive behavior (1.2 vs. 1.9 times/sow/h, SE = 0.27; $P = 0.07$). Dietary tryptophan treatment did not affect parallel pressing and head to body knocking, which are more intense aggressive interactions compared to head to head knocking in swine. There was no difference in injury scores caused by aggression and in cortisol levels between treatments. Sows fed the treatment diets had more total piglets born (12.6 vs. 10.5 piglets/litter, SE = 0.54; $P < 0.01$) and more piglets born alive (10.9 vs. 9.7 piglets/litter, SE = 0.44; $P < 0.05$) than sows in the control group.

The results indicated that supplementation of dietary tryptophan at twice the recommended inclusion rate for 3 days before and after mixing did not effectively reduce mixing-induced aggression and associated stress in gestating sows. However, sows that received two times the recommended amount of dietary tryptophan had larger litter sizes at birth. Future studies are needed to investigate the dosage of tryptophan or length of time supplemented, to determine if an increased amount for a longer period of time may reduce aggression in group-housed sows.