RESEARCH ABSTRACT

ANIMAL WELFARE

Title: **Optimized alternative housing and management strategies enhance sow well-being**
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Scientific abstract

New housing systems or management strategies are being implemented without scientific support that confirms these alternatives systems improve sow well-being. The objectives of this study were to evaluate the effects of housing sows in either an individual standard (**STS**) or turn-around (**TAS**) stall throughout gestation (d 6 till 110), or housing sows in either STS or TAS till d 30 of gestation, and then housing 10 sows in a pen for the remainder of gestation on sow well-being. Forty sows across 5 blocks (n = 200 sows) were allocated to 1 of 4 treatments: STS (**S:S)** or TAS (**T:T**) for entire gestation or STS till d 30, then group-pen (**S:GP**), or TAS till d 30, then group-pen (**T:GP**). Group-size was held constant and floor space allowance in each pen was 2.3 m^2/sow. On d 30 and 90 of gestation sow immune and endocrine traits (n = 162 sows) were measured. On multiple days throughout gestation sow behavior (n = 150 sows) was registered during time periods 0800-0900 h, 1200-1300 h, and 1600-1700 h (n = 150 sows). Sow BW was measured on d 30, 90, 110, and end of lactation. Litter performance was collected at farrowing and weaning. Data were analyzed using Proc MIXED with repeated measures (SAS). There was a stall type × day of gestation interaction for sow behavior and immune status ($P < 0.05$); on d 30 plasma cortisol was greater and NK cytotoxicity was less for sows housed in TAS compared with those in STS. Standing and ONF behaviors were greater ($P < 0.05$) for sows housed in TAS on both d 6 and 30. Sows housed in TAS performed more ($P < 0.05$) standing and eating behavior than did sows housed in STS. Stall type and time of day affected immune and behavior traits ($P < 0.05$) with NK cytotoxicity and lymphocyte proliferation being greater ($P < 0.05$) for sows housed in STS prior to pen placement (S:GP) compared with sows in T:GP on d 90. Sows from TAS and housed in group pens (T:GP) performed more ($P < 0.001$) bouts of aggression especially during time period 1 (0800-0900 h; feeding). Regardless of day of gestation, sows housed in S:GP had greater total WBC count ($P < 0.05$), neutrophil phagocytosis ($P < 0.05$), and NK cytotoxicity ($P < 0.10$) than sows in T:GP while sows housed in T:GP had greater neutrophil chemotaxis ($P < 0.05$). Sow body weight gain was not affected by previous stall environment but sows in pen gained more ($P < 0.001$) body weight than did sows in stalls and sows in S:GP losing the most body weight at end of lactation ($P < 0.09$). Sows housed in S:S had better litter performance than did sows housed in T:T or S:GP ($P < 0.05$). These data support that stall environment prior to housing in pen and throughout gestation can impact sow well-being based on multiple measures of well-being.