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EFFECT OF DAY OF MIXING GESTATING SOWS ON MEASURES RELATED TO REPRODUCTIVE PERFORMANCE, PHYSIOLOGY AND WELL-BEING.

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This study tested for the effects of day of mixing sows following breeding on reproduction and wellbeing during the summer months on a commercial farm. Sows (n = 1436) of mixed parity (2-6) were weaned and assigned at estrus to housing treatment in: 1) stalls from weaning through gestation (Stall); 2) stalls from weaning until mixing at d 3-7 (D3 Mix); 3) stalls from weaning until mixing at d 13-17 (D14 Mix); and 4) stalls from weaning until mixing after d 35 (D35 Mix). Sows were mixed into pens in a group of 58 sows. Measures of well-being were obtained to include fighting events, lesions, and lameness, cortisol change, and body condition in the first 12 d after mixing or movement into a permanent stall (Period 1) and lesions, lameness and body condition thereafter until farrowing (Period 2). Conception rates were lower with D3 (87.1%) and D14 Mix (89.2%) compared to D35 Mix (92.2%) and Stall (96.2%). Farrowing rates remained lower in D3 Mix (82.8%) compared to other treatments but D14 Mix (87.8%) did not differ from D35 Mix (90.5%) and Stall (92.8%). Litter size was not affected by treatment ($P > 0.10$) and averaged 12.0 total born pigs. For sows that farrowed, there was an effect of treatment on the proportion of sows bred within 10 d of weaning which was lower ($P < 0.05$) for sows in the D3 and D14 Mix treatments compared to those in Stalls but not the D35 Mix. Number of fights in the first 24 h after mixing was lower in the D14 Mix compared to the D3 and D35 Mix groups ($P < 0.0001$). In period 1, cortisol increases were greatest ($P < 0.05$) in mixed sows compared to sows in Stall.

There were ($P < 0.05$) effects of treatment, period and interactions for lameness, leg inflammation, lesions and body condition score. In periods 1 and 2, mixing resulted in increased incidence of lameness, and increased lesion scores compared to Stall. Incidence of leg inflammation was not different in period 1 but was increased in period 2 for D3 Mix and Stall compared to other treatments ($P < 0.05$). Overall reproductive performance for all treatments were similar or above industry averages and notable since the project was performed in the summer by design. For measures of well-being, there were no indications that welfare was compromised in any of the treatments since increases were often subtle, transient, or declined in period 2. To compare treatments a ranking system of best to worst was performed for each reproductive and well-being response in each period. Final ranking was the same for reproductive measures and well-being measures for both periods with the ranking order from best to worst: 1) Stall; 2) D35 Mix; 3) D14 Mix, and 4) D3 Mix (Table). Results suggest that optimal reproduction and well-being can be achieved with use of stalls and that day of mixing can reduce all measures. Mixing in the first week results in reduced farrowing and well-being measures compared to mixing after the fifth week, while mixing after the 2nd week shows intermediate effects. When mixing sows, short term responses for well-being and long term measures for reproduction and well-being must be considered to evaluate the effects of housing management.

Table. A sum ranking for assessments of increased levels of reproductive performance and improved measures of animal well-being.

Treatment	Reproductive response sum ¹	Well-being response sum		Total sum	Final rank ⁴
		Period 1 ²	Period 2 ³		
Stall	3	10	8	21	1
D3	11	24	18	53	4
D14	9	22	13	44	3
D35	7	18	12	37	2

¹included farrowing rate, litter size and sows rebred

²includes fights, cortisol, lameness, inflammation, lesions (head, body, vulva), and body condition score

³includes lameness, inflammation, lesions (head, body, vulva), and body condition score

⁴best possible score (18) from rank of 1 for each measure and worst possible score (72) from rank of 4 in all 18 categories.