

Feeding behaviour, aggression and dominance in group-housed sows

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Group-housed sows are required to share resources and competition for feed is of paramount importance both for production and sow welfare (Verdon *et al.* 2015). We hypothesised that there are relationships between aggression, dominance status and feeding behaviour after mixing in gestating sows.

Over two replicates on a commercial farm, 100 Landrace × Large White primiparous sows were randomly mixed within 1 week of insemination into pens of 10 with a floor space allowance of 1.8 m²/sow. Sows were fed a daily allowance of 2.5 kg/sow of a pelleted food over four feeding bouts (0730, 0900, 1100, 1500 hours) via two overhead drop feeders placed 2 m apart. Sows were individually marked and observed through video recording on d 2 and 9 (i.e. 1 week later) after mixing for the first and third feeding bouts. The presence of individuals in the area under each feeder was observed using instantaneous point sampling at 30 s intervals for 30 min after feed delivery. Aggression delivered and received by each sow at feeding was observed continuously for the same period. Individual sow aggression level and resulting index were calculated according to Rault *et al.* (2014), with sows classified as dominant (D) if they delivered more aggression than they received, subdominant (SD) if they received more than they delivered, and submissive (S) if they never delivered aggression. Data were analysed using a mixed model with Tukey adjustments for post-hoc comparisons or Spearman rank correlation test if not normally distributed in SAS (v. 9.3).

The interaction of day and feed bout was significant ($P=0.03$). Sows were present in the feeding area less often during the third feeding bout on d 2 than during the first bout on d 2 and during the first and third bouts on d 9 (all $P\leq 0.02$). There was a weak correlation between aggression level and overall presence at the feeder ($r=0.16$, $P=0.001$) that held true on d 2 ($r=0.23$, $P<0.001$) but not on d 9 ($r=0.07$, $P=0.35$). Using the aggression index, 37% of sows were classified as D, 29% as SD and 34% as S. Both D and SD sows were present more often in the feeding area than S sows on d 2 ($P\leq 0.007$) but not on d 9 ($P>0.05$) (Table 1). Dominant sows were present more often in the feeding area than S sows during the first bout ($P=0.001$) but less frequently during the third ($P=0.03$), whereas SD and S sows had similar presence at the first and third feeding bouts ($P>0.05$). There was no individual sow preference for left or right side feeders ($P>0.05$).

Table 1. Sow presence in the feeding area by aggression index, day and feeding bout (Least-squares means ± SE, unit is average count over 60 intervals per feeding bout).

Aggression index	Day 2		Day 9	
	1 st feeding bout	3 rd feeding bout	1 st feeding bout	3 rd feeding bout
Dominant	28.5 ± 1.7	22.1 ± 1.7	26.5 ± 1.5	23.9 ± 1.8
Subdominant	26.0 ± 1.9	22.2 ± 1.8	23.9 ± 2.0	25.6 ± 2.0
Subordinate	19.2 ± 1.8	16.1 ± 1.9	21.9 ± 2.0	22.4 ± 1.6

Presence at feeding differed more on d 2 than on d 9 after mixing. Dominant sows were seen less often at the third bout, suggesting they may be satiated after the first feeding bout of the day. In agreement, Verdon (2014) found that D sows gained most weight between d 2 and 100 after mixing in that system. However, SD sows were present as frequently in the first and third bouts. Multiple feed drops may therefore provide SD sows increased opportunities to access feed in later bouts. Verdon (2014) also found that aggression received by SD and S sows reduced with subsequent feeding bouts. Nonetheless, S sows were seen less often in the feeding area on d 2, possibly because there was more competition from D sows for the first bout and then from SD sows for the third bout. In conclusion, feeding sows over four bouts may reduce competition for feed on d 2 after mixing, benefiting SD but not S sows. The challenge remains to allow sows at the bottom of the hierarchy sufficient access to feed to safeguard production and welfare of group-housed sows, although drop feeding is recognized as a feeding system with intense feeding competition.

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