



<p>Project Number & Title Project Number & Title: <i>1C-107: Improving behaviour, welfare and commercial performance of group housed sows through development of appropriate selection criteria</i></p>
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<p>Aims and Objectives The project had three primary objectives:</p> <ol style="list-style-type: none"> 1) To establish whether “competitive” or “social genetic” effects influence sow performance, as assessed using data on reproductive outcomes for sows housed in known groups. The philosophy is that animals which perform better to the detriment of their pen mates could be identified as having a negative social effect only under “competitive effects” BLUP models, and not using conventional BLUP. 2) to provide “proof of concept” that proximity logging networks can provide an effective and efficient way to collect additional behavioural data on group housed sows, and 3) To investigate the heritabilities of and associations between some novel behavioural traits (flight time and fight lesion scores) recorded on gilts at selection, 24 hours post-mixing, with their later attributes as group housed sows.
<p>Key Findings</p> <p>Data from pedigreed nucleus sows that were housed in small groups (4-10 sows) from about day 35 of pregnancy was used to examine social genetic effects on sow performance. This dataset revealed small heritable social genetic effects affecting litter size traits. However, estimates of social genetic effects are likely to be affected by group size, stage of gestation when mixed, space allowance and whether sows are in static or dynamic groups. Thus, the results of this study may currently underestimate the magnitude of social genetic effects compared to some other more challenging production systems. Proximity loggers were able to automatically record contacts (and duration of contact) between specific sows in small groups. However, numerous technical difficulties including loss of collars, and the need for simultaneous collection of video analysis to link observed data with logger data were encountered during this component of the Project. Consequently, this component was terminated on the basis of an inability to develop a consistent and reliable implementation procedure for the proximity loggers. Both flight time and lesion score traits were low to moderately heritable behavioural measures. Flight time was lowly heritable (0.07-0.12), uncorrelated with any sow reproductive parameters, and appears to have little value as a potential selection criterion in maternal lines of pigs. In contrast, scoring fight lesions 24 hours post-mixing as gilts was practical, moderately heritable (0.12-0.15) and related to reproductive outcomes of sows. Selected gilts that were considered aggressive (had higher anterior lesion scores) had a higher wastage and were more likely to leave the herd without farrowing. Furthermore, aggressive gilts that entered the herd and went onto farrow produced litters that had lower birthweights, 21 day litter weights and higher pre-weaning piglet losses in their first parity.</p>
<p>Application to Industry</p> <p>This project has shown that sophisticated genetic models may be used to estimate social genetic effects and to identify sows that perform well in groups, but not to the detriment of other animals in the pen. However, the need for adequate performance data combined with tracking individual animals to groups may be beyond the capability of herd recording systems for many breeding herds at the moment. In R&D studies, assessment of behaviour and interactions between sows in groups will continue to rely upon video analysis (VIA), until the proximity loggers or GPS technology are developed sufficiently to provide a viable alternative. This technology is likely to be developed and miniaturised in ear tags for larger animals such as dairy cattle, before it may be adapted to further application with sows. For breeding program applications, VIA will not generally provide useful data on a sufficiently large scale. Overall, this Project demonstrated that the development of meaningful selection criteria based on behavioural attributes which have positive welfare benefits and which are practical to implement in commercial breeding programs, will not be straight forward. However, lesion scoring 24 hours post-mixing showed the most promise as a potential selection criterion. In addition, in dam lines of pigs, with ongoing selection for longevity and maternal attributes, there would be slight downward pressure on fighting post-mixing as a correlated response, which should improve both the welfare and reproductive performance of group housed sows. Strategies to minimise aggression amongst gilts post-mixing is expected to have favourable consequences for gilt wastage and first parity reproductive performance.</p>