1C-108: *The sensitivity of sows to stressors throughout gestation*

Project Leader: Jean-Loup Rault

Project Participants: Pieter Langendijk, Kate Plush

Aims and Objectives

The best way to mix gestating sows is still controversial. Sows habituate to different housing conditions based on their physiological stress-response. Pregnancy hormones secreted during gestation may underlie this hyporesponsivity to stressors through physiological adaptation. Alternatively, sows may habituate through behavioural adaptation by changing their social strategies. This project aimed to elucidate the mechanisms regulating the stress response of sows that are mixed into groups during early gestation and its implications for stress-coping ability and reproductive performance.

Key Findings

Experiment 1 could not confirm that sows become hypo-responsive to stressors in the first trimester of gestation. However, the resident-intruder test showed that pregnant gilts experienced aggressive encounters quicker than ovariectomised gilts. We found weak evidence that the hormone allopregnanolone may be involved in some components of social interaction, with allopregnanolone concentrations positively correlated with lower aggressiveness. Nonetheless, the alfaxan treatment as an allopregnanolone agonist could not explain most of the differences between pregnant and ovariectomised gilts.

Experiment 2 showed that sows started and used more high aggressive behaviours such as bites, head knocks, and pushes, at a floor space allowance of 1.45 m^2 per sow on day 2 whereas encounters at 2 m^2 and especially 2.9 m^2 were more frequent but less aggressive, with more nose contacts or threats. Differences between space allowances vanished on day 9. Hence, social interaction patterns differed, with more aggressive and less frequent interactions between sows at smaller space allowances and shortly after mixing.

The results of these two studies suggest that sows respond through behavioural adaptation rather than any physiological adaptation when they are mixed into groups.

Application to Industry

Overall, these experiments support the hypothesis that sows habituate to different housing conditions through behavioural adaptation by changing their social strategies.

Offering more space at mixing can increase the frequency of mild or neutral social interactions (e.g. threats and nose contacts) within a group of unacquainted sows while reducing the intensity of aggression (e.g. bites). These differences were no longer apparent by day 9 after mixing, supporting previous observations that the effect of space on social interactions is more pronounced within the first days after mixing unacquainted sows.

Producers may offer more space allowance to sows upon mixing and for the short period after the establishment of the group, to allow sows to better adapt to the mixing process. Mixing sows successfully into groups should be possible at any stage of pregnancy as there does not appear to be a preferred stage of pregnancy where sows are more physiologically suited to the mixing process.