



RESEARCH UPDATE

SowWeanWel

Effects of chronic stress during pregnancy on sow welfare, reproductive performance, & on the resilience of offspring to stress.

This project is a collaboration between Teagasc & the Institute of Genetics & Animal Biotechnology, Poland.

Background

Suboptimal housing and management pose many welfare threats which induce chronic stress in sows. When experienced during gestation, chronic stress also has detrimental consequences for the stress-coping ability, behaviour and immune function of piglets. This is known as prenatal stress. Its negative implications for offspring resilience are a major driver of antibiotic use in those animals, contributing to antimicrobial resistance development. Hence, tackling sow chronic stress via improvements to her welfare can be beneficial for offspring productivity and resilience, with a range of positive knock-on effects.

Objectives

The two final studies of the SowWeanWel project aimed to:

Review the potential of several factors associated with aspects of housing systems & individual sow characteristics to cause chronic stress in gestating sows

Investigate the effect of improvements implemented to a gestation housing system (IMPROVED) against an unimproved, conventional system (CONTROL) on sow and piglet welfare indicators

Aim 1 - Risk factors for chronic stress in sows housed in groups, and associated risks of prenatal stress in their offspring

Literature was reviewed to assess the potential of a range of factors to contribute to chronic stress in pregnant sows. Factors identified were associated with the physical and social aspects of sow gestational environments, as well as with individual sow characteristics, and included;

Space allowance, Group size and type, Feeding level and system, Lameness, Pen design, Enrichment and rooting material, Floor type, Quality of stockmanship, Environmental conditions, Sow characteristics (body weight variation, parity, coping style)

As chronic stress is of detriment to the developing offspring, the mechanisms of action of both chronic and prenatal stress were also discussed in the literature review.

For more information visit www.teagasc.ie/pigs



Aim 2 – Effect of improved gestation housing on sow and offspring welfare and health indicators

This study took place on a commercial 2000-sow farrow to finish farm. Sows (n = 240, 6 replicates) were mixed into stable groups of 20 unfamiliar animals on day 30 post-service in group pens with free-access, full-length individual feeding/lying stalls. CONTROL (n = 120) pens had fully-slatted, concrete floors, two blocks of wood and two chains suspended within the group area. IMPROVED (n = 120) pens were the same, but with rubber mats, a length of manila rope in each feeding stall, and straw provided in three racks. Levels of sow oral stereotypies and aggression were observed 72hr post-mixing, in mid and late pregnancy. Skin lesions were counted 24hr post-mixing, 3 weeks post-mixing and in late pregnancy, and locomotion was scored on entry to gestation housing (day 30 post-service), in mid and late pregnancy. Saliva was collected from each sow on day 79 of gestation and used for analysis of haptoglobin (inflammation marker). Tear staining around the sows' eyes (chronic stress indicator) was scored in late pregnancy, in mid lactation and at weaning. Reproductive performance was recorded at farrowing, along with birth weights, vitality and IUGR scores of piglets. Finally, the presence of scour was scored in the farrowing crates approximately every second day throughout lactation.

Sows in IMPROVED pens performed fewer oral stereotypies in mid and late pregnancy. There was more aggressive behaviour among sows in IMPROVED pens in late pregnancy, but skin lesion counts did not differ between treatments, and were low in general. Behaviour analysis of sow movement within pens showed that sows in IMPROVED pens moved around more than sows in CONTROL pens. Despite this, sows in IMPROVED pens were not any more likely to be lame than CONTROL sows, as treatment had no effect on locomotory ability. Sows in IMPROVED pens had lower right and left eye tear stain scores at each scoring event, and they also had lower concentrations of haptoglobin, indicating lower levels of chronic stress and systemic inflammation. Sows from IMPROVED pens had fewer piglets mummified, and their piglets tended to have higher birth weights compared to piglets born to sows housed in CONTROL pens. Piglets born to sows housed in IMPROVED pens also had lower IUGR scores, and lower scouring during the suckling period.

Take home message

Despite increased levels of aggression associated with competition for enrichment resources, the changes to the housing system improved sow welfare during pregnancy.

This translated into improved offspring resilience and health during the suckling period, with potentially positive knock-on effects for antibiotic usage in piglets.

Martyna Lagoda

PhD Student



Martyna Lagoda is the PhD student working on the SOWWEANWEL project, which is now nearing completion. She is supervised by Dr. Laura Boyle & Dr. Keelin O'Driscoll from Teagasc, & Dr. Joanna Marchewka from IGAB. Prior to joining the project Martyna obtained a Master's degree in Animal Behaviour & Welfare from Queen's University, Belfast. Martyna gained experience in the area of laboratory & companion animal welfare through completion of several internships. Martyna's research interests span the area of animal welfare, currently focusing on farm animals.

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