Implications of stress in sows for performance & welfare & for the resilience of piglets to stress/disease

Laura Boyle

K. O’Driscoll¹, S. Foister¹,², R. Peden², S.P. Turner², J. Marchewka³

¹PDD, Moorepark, Fermoy, Co. Cork, Ireland
²SRUC, Easter Bush, EH25 9RG, Scotland, UK, ³Institute of Genetics and Animal Breeding, Polish Academy of Sciences, Dept. Animal Behaviour, Magdalenka, Poland
Introduction

- Group living is a stressful experience for sows
- **Social stress**: acute (i.e. mixing) and chronic (e.g. competition)
- Low space allowances, competition for access to resources, lack of hide areas to escape from bullying and lack of differentiated areas

(Spoolder et al., 2009)
Consequences of aggression

Stressor

Pre-natal stress: A negative experience of the pregnant mother affecting the development of the offspring
Implications

- Sow reproductive performance in Ireland still lags behind that of our competitors
- Highest sow replacement rate in the EU (55% - Interpig, ’17)
- **Pre-natal stress:** poor immunity and coping ability in the piglets
- Difficulty coping with weaning stress?
- Pigs are highly susceptible to disease at weaning
  - high antibiotic usage
- Contribution to AMR?
- Suppressed growth and feed efficiency
- Constrains our ability to produce high quality pigs
SowWeanWel

- 4 year project (2018-2020)
- 1 Walsh Fellow
- 3 main tasks

**Aims:**

- To evaluate effect of chronic stress in pregnant sows on
  - sow welfare, health and reproductive performance
  - resilience of their piglets in terms of coping with stress and health challenges
- Identify risk and protective factors associated with different housing and feeding systems for pregnant sows
**Task 1: Relationship between aggression and sow reproductive performance**

- Study conducted on a commercial farm (March to July 2018)
- Sows housed in self closing stalls for 28 days post service
- Over a 7wk period data collected on 263 sows in 11 groups of 24
- No. skin lesions, hair cortisol and sow performance (litter size/weight, BA, BD, weaning weight, mortality etc.)
**Task 1: Relationship between aggression and sow reproductive performance**

- Skin lesions are a proxy measurement of aggression
- Counted number of skin lesions post-mixing (d29) and 3 weeks later (d50)
  - Front (head, neck, shoulders & front legs)
  - Middle (flanks & back)
  - Rear (rump, hind legs & tail)
Variation between groups in no. skin lesions

![Graph showing variation in skin lesions between groups over time. The x-axis represents group number, and the y-axis represents the number of skin lesions. Two conditions are compared: 24hr and 3wk, indicated by green and yellow bars respectively. There is a significant difference (P<0.001) between the two conditions across different groups.]
Social network analysis
No. skin lesions (median [min. - max.]) post mixing (PM)

<table>
<thead>
<tr>
<th>Region</th>
<th>24hr PM</th>
<th>3wk PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>13 (0-117)</td>
<td>5 (0-46)</td>
</tr>
<tr>
<td>Middle</td>
<td>4 (0-47)</td>
<td>2 (0-32)</td>
</tr>
<tr>
<td>Rear</td>
<td>3 (0-36)</td>
<td>5 (0-52)</td>
</tr>
<tr>
<td>Total</td>
<td>23 (0-157)</td>
<td>15 (0-105)</td>
</tr>
</tbody>
</table>

- ↓ no. lesions between 24hrs & 3wks PM
- Sows being attacked from behind (chronic aggression)
- Variation between groups and between sows
Task 2: Factors influencing aggression in sow housing systems

- Uniformity of sow housing systems in Ireland presents a challenge in conducting such epidemiological research
- Collaboration with Institute for animal breeding and Genetics in Poland
- More variation in sow herd sizes and housing/feeding systems than in Ireland
- Poland is similar to Ireland in terms of its intensiveness
Task 2: Factors influencing aggression in group housing systems

- Polsus - Select farms/arrange visits
- Collect data on housing & management
- Animal based assessments
- Herd reproductive performance data (Polsus)
- Epidemiological evaluation of risk and protective factors
Task 3
Part A: Benefits of minimising chronic stress for pregnant gilts

- Commercial farm using small static groups
- Mix pregnant gilts with sows into two housing systems after service
  1) Social stress
  2) Reduced social stress
- Welfare, health, physiological and immunological measures as well as performance and antibiotic usage

Part B: Benefits to piglets

- Piglets will be followed from birth to slaughter
- Intense measures through to the end of the 2nd weaner stage (vitality, weights, coping/healing ability, stress responses, AB use)
- Expect that piglets will be better able to cope with weaning stress
Take home message

SowWeanWel will yield information on how to improve sow productivity/longevity, produce better quality pigs and reduce AB use.
Thank you!

- Pig farmer and staff
- Erik Scholten