

Impact of early life experiences on the development of ear necrosis in weaned pigs



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Ear necrosis background



- Complex, multifactorial disease with an unknown etiology
- Ear lesions vary in severity and mainly afflict pigs post-weaning, ~8-12 weeks of age
- Health problem in several countries with intensive production systems
- Poorly studied health issue



Ear necrosis is a welfare concern



Provide a route of entry for secondary pathogens



Associated with pericarditis¹ in slaughter pigs



Severe lesions are likely painful



Potentially leads to  antibiotic usage



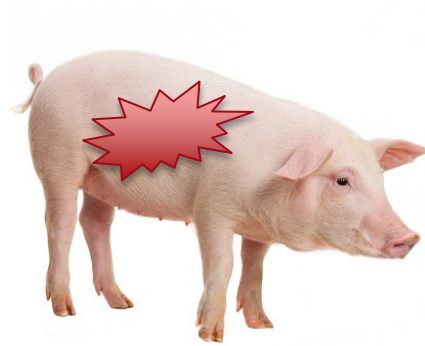
¹Pessoa et al., 2021

Hypothesis 1: External origin by trauma to outer surface of the ear



Hypothesis 2: Internal origin by systemic inflammation and vascular occlusion

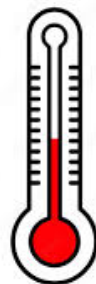
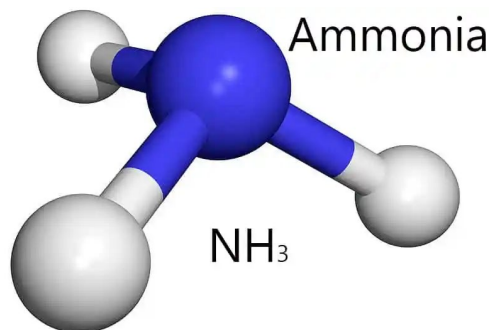
1. Systemic inflammation



What causes the systemic inflammation?

➤ *Immune response*

Risk factors for ear necrosis



External hypothesis

Aggression

Occurs when establishing a social hierarchy



Mixing of unfamiliar pigs



Weaning

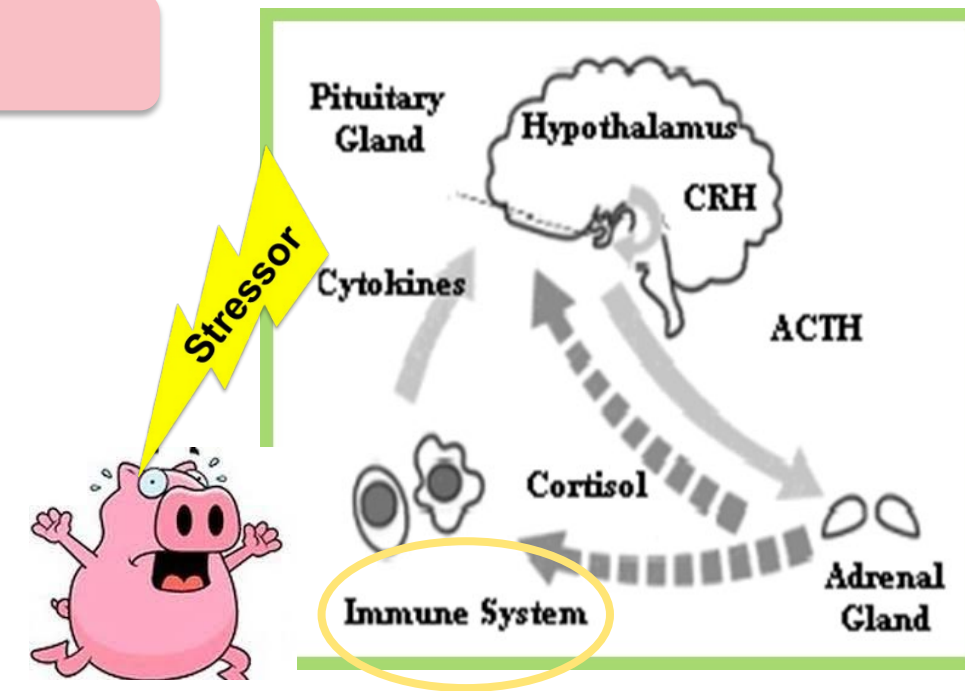


Results in fight lesions on the body and **ears**
(ear scratches)

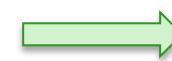


Internal hypothesis

Farm management practices as stressors



? Can stress induce an immune response that increases susceptibility to **ear necrosis**?



Handling by humans



Applied Animal Behaviour Science
Volume 15, Issue 4, July 1986, Pages 303-314

The influence of handling by humans on the behaviour, reproduction and corticosteroids of male and female pigs

P.H. Hemsworth, J.L. Barnett, C. Hansen

“...the **unpleasant handling** treatment resulted in a **chronic stress response**, with consequent adverse effects....”

A close-up photograph of a piglet's head, focusing on its ears. The ears show signs of necrosis, with dark, charred tissue at the tips. The piglet's skin is pink and slightly wrinkled. The background is blurred, showing more of the piglet's body.

Objective: Investigate the effects of

- 1) frequent handling of piglets pre-weaning and
- 2) mixing at weaning

on ear necrosis development post-weaning

Experimental Design



Pre-weaning

Control litters (**CON**; n = 18)

Handled **3 times**

Handled litters (**HAND**; n = 19)

Handled **8 times**

Half of the litters from each treatment



Pre-weaning treatment



Control litters

Handled 3 times

Handled litters

Handled 8 times

Birth



1

Processing



2

Weaning



3

Control pigs

Handled 3 times

Handled litters

Handled 8 times

Weighed an additional 5 times



Pre-weaning measures

- Weights – at weaning (d28)
- Scour scores - 3x/week
- Faecal cortisol (ELISA, Salimetrics)
- Mortality

Post-weaning measures

- Ear scratch counts – d1 post-weaning
- Ear necrosis scoring – weekly
- Weights - end of weaner stage





Ear scratch

Ear necrosis



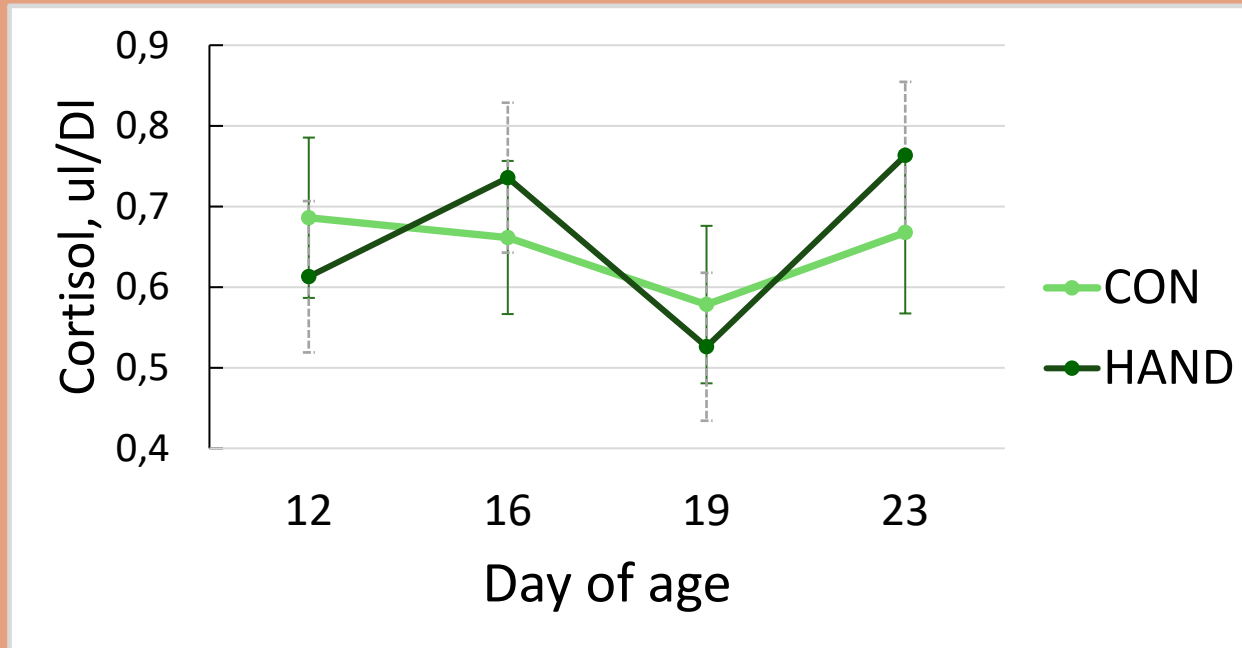
Statistical Analysis



- Analysed pre- and post-weaning treatments in separate models
- Experimental unit = pen
- Linear mixed models (PROCmixed)
- Non parametric tests (Wilcoxon) were used for non normal data

Pre-weaning health and performance results

Faecal cortisol

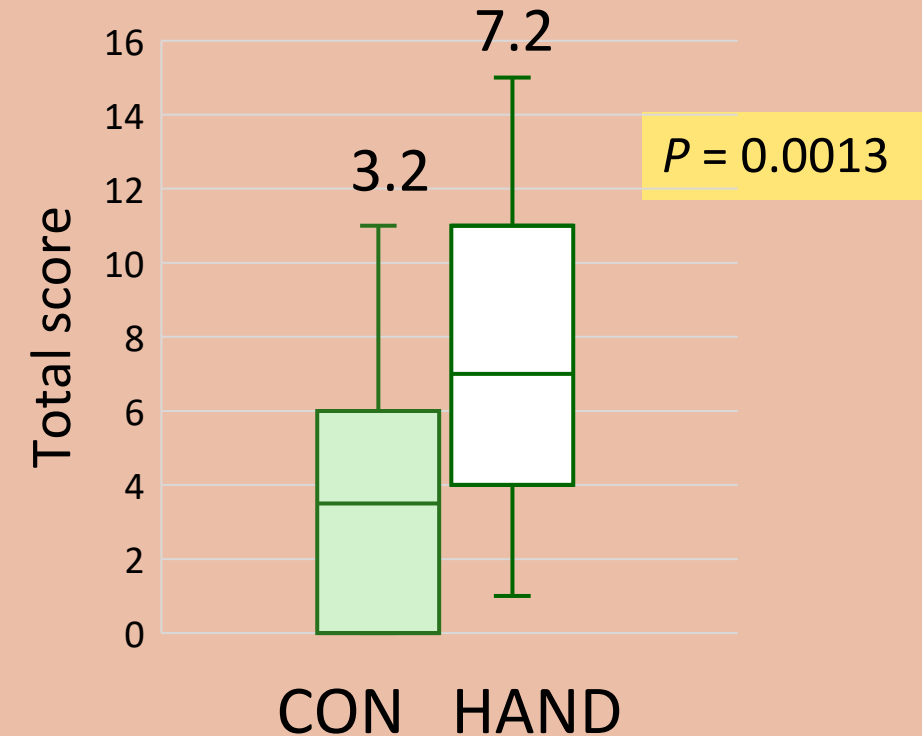


Treatment $P = 0.85$

Day $P = 0.12$

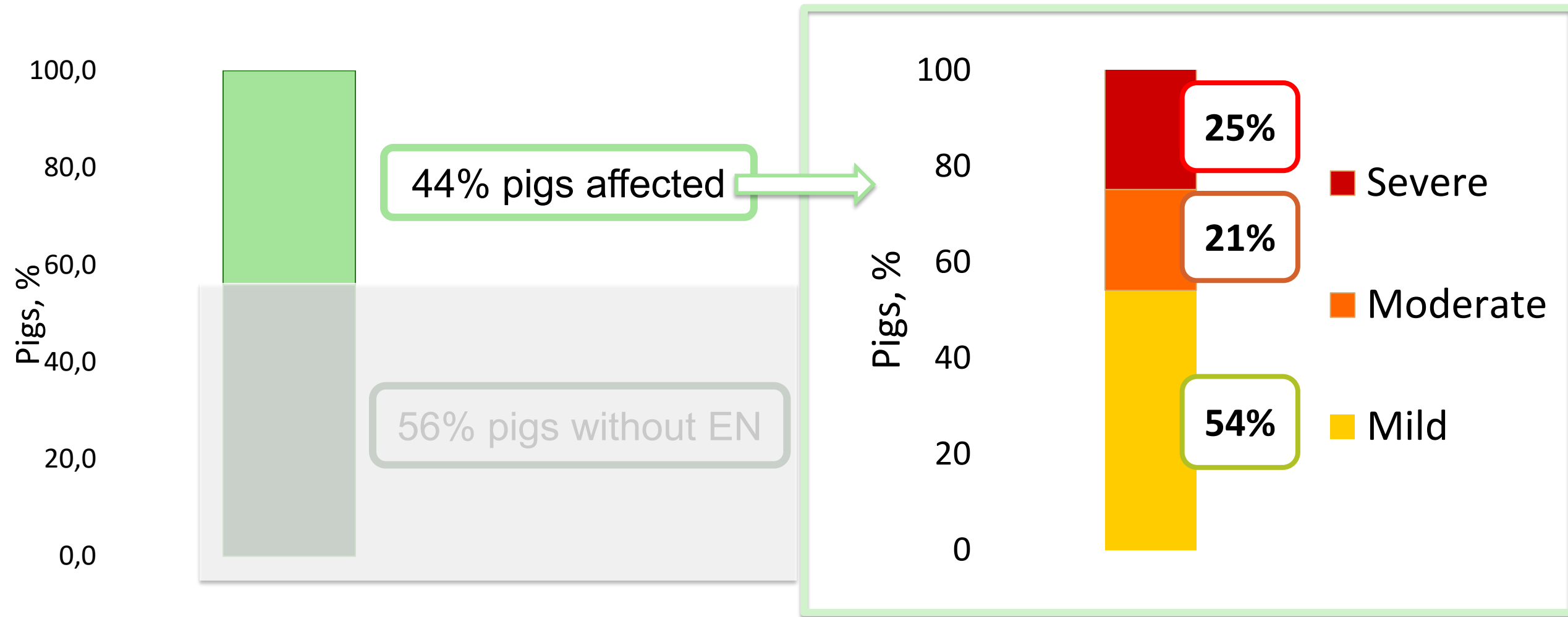
Treatment*Day $P = 0.57$

Scour



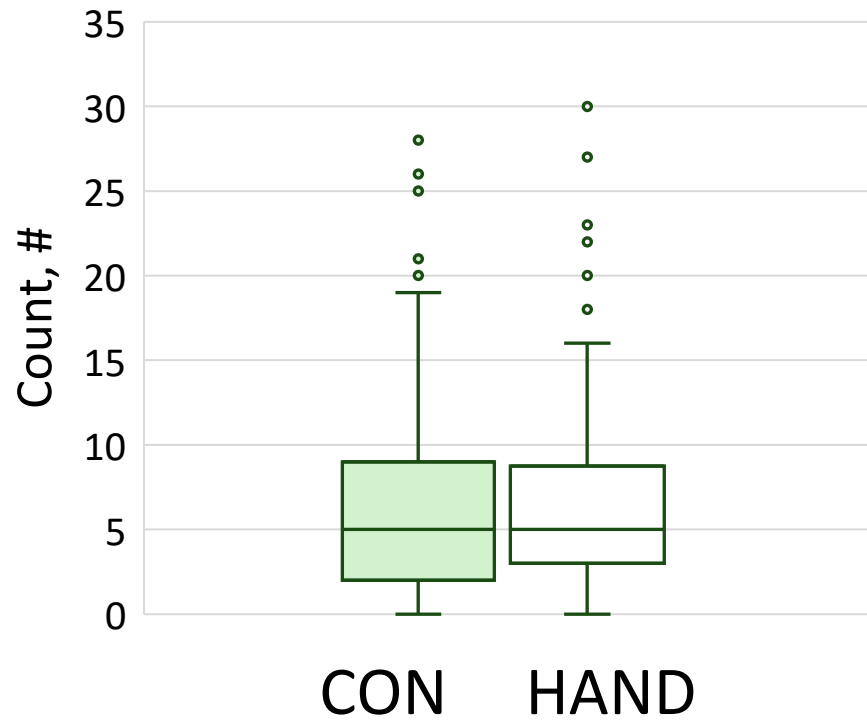
There was no difference in **weaning weights** or **mortality**

Proportion of pigs with ear necrosis overall



Effect of pre-weaning treatment on ear health

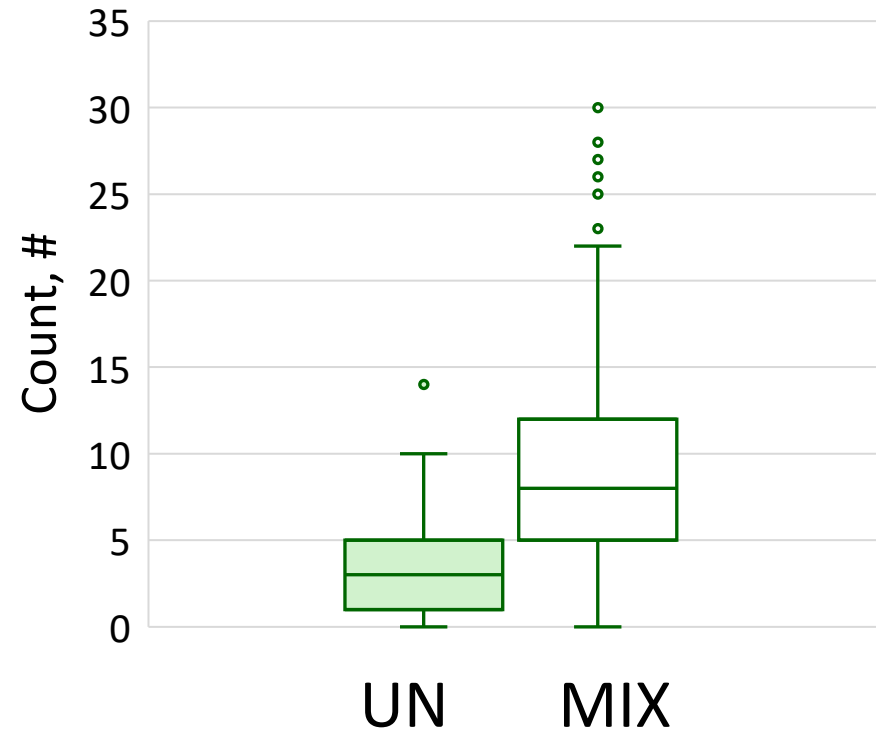
Ear scratch



$P = 0.82$

Effect of post-weaning treatment on ear health

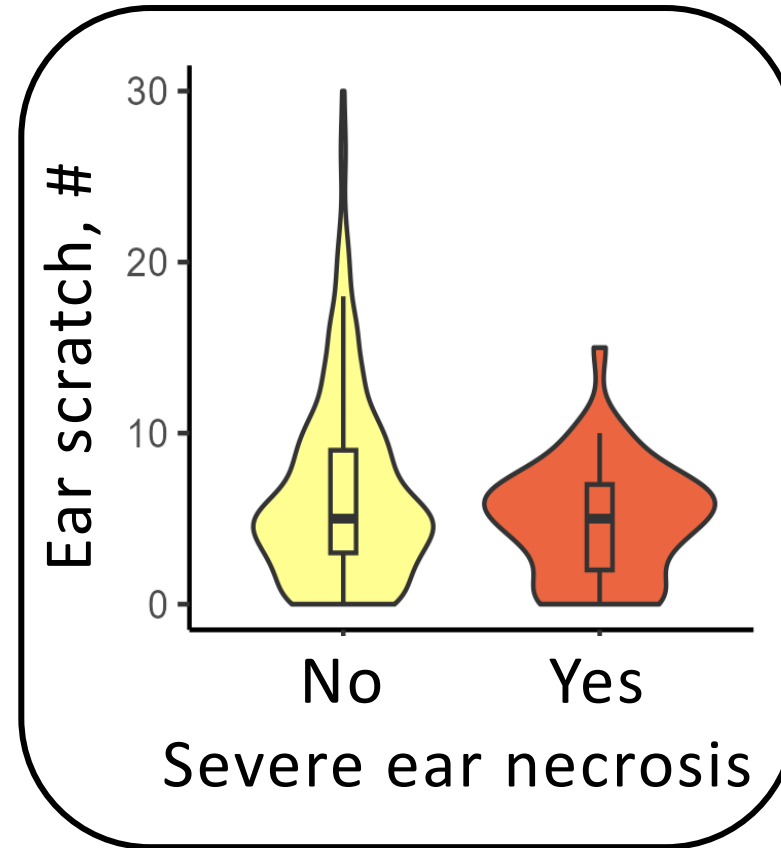
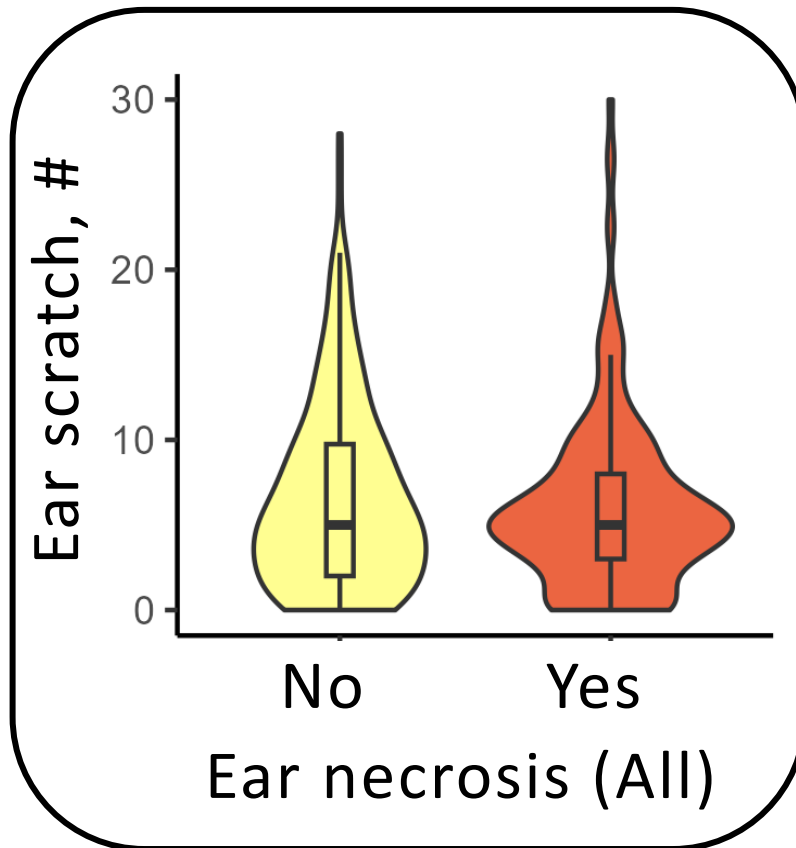
Ear scratch



$P < 0.001$

Relationship between ear scratch and ear necrosis

Ear scratch count did not influence the **likelihood of developing EN**



Summary of results

Handled litters had higher scour scores

- Stress response from handling? Or cross-contamination between litters?

Take home messages

Minimise handling in piglets pre-weaning

The role of ear biting (i.e. external hypothesis) should not be discounted



Ear necrosis is complex! Is it possible that intrinsic animal factors are more influential than housing and management aspects?

Thank you for your attention!

Acknowledgements

- Moorepark pig unit staff
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- The pigs