An investigation of early life indicators in relation to ear necrosis in pigs

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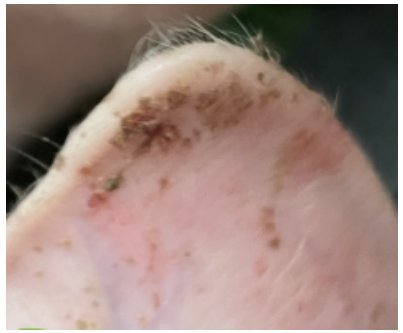
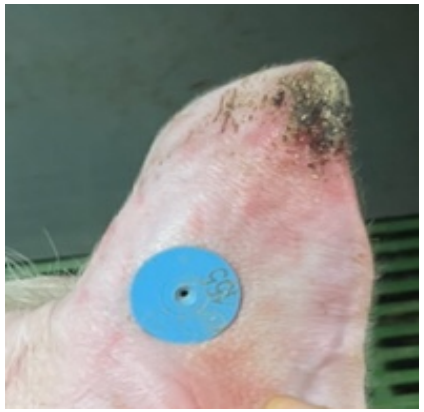
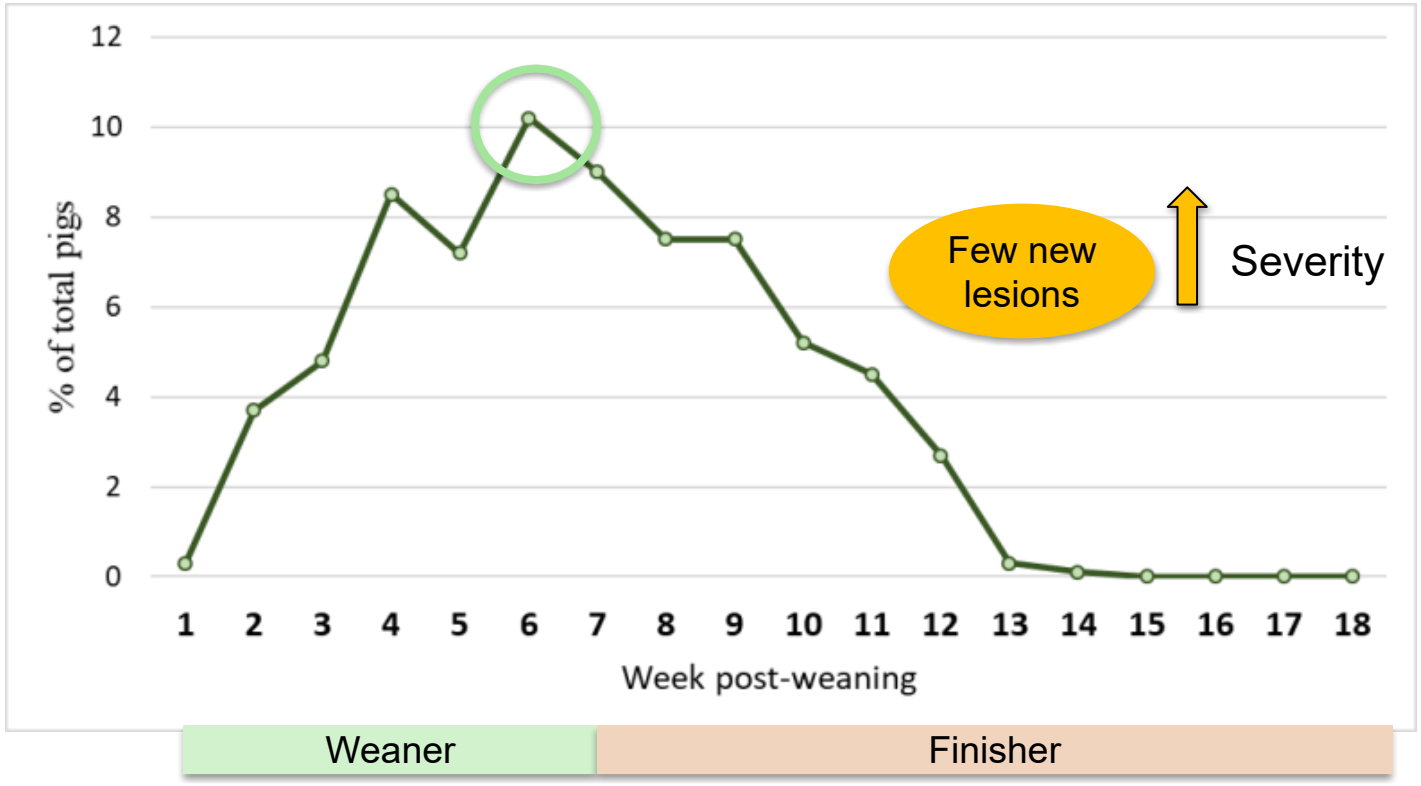
Ear Necrosis





Lesions vary in severity and mainly afflict weaner pigs

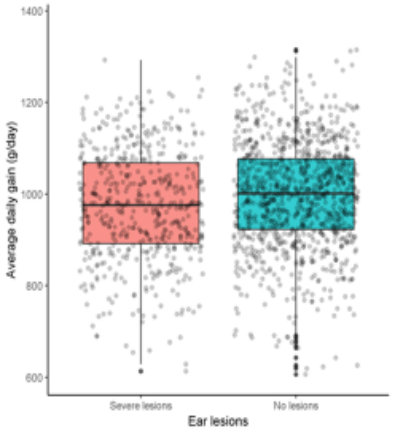


Ear Necrosis

Ear necrosis is a welfare concern

Route of entry for pathogens

Painful

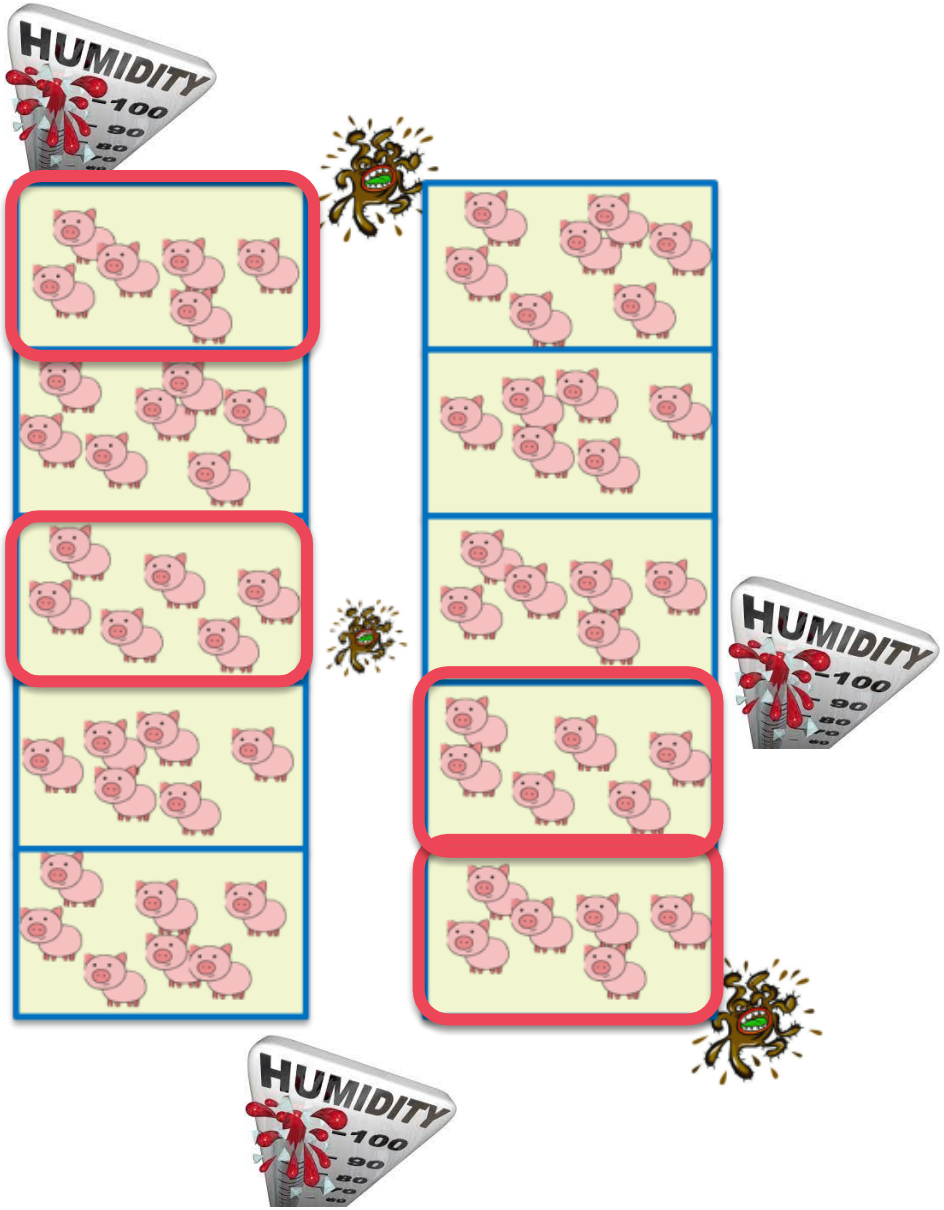


Growth (Pessoa PhD thesis, 2022)

Associated with pericarditis (Pessoa et al., 2021)

Multifactorial etiology *(Smulders et al., 2008; Park et al 2013)*

But.....



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ELSEVIER

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Early life indicators predict mortality, illness, reduced welfare and carcass characteristics in finisher pigs

Julia Adriana Calderón Díaz [a b], Laura Ann Boyle [a], Alessia Diana [a c], Finola Catherine Leonard [c], John Patrick Moriarty [d], Máire Catríona McElroy [d], Shane McGettrick [d], Denis Kelliher [e], Edgar García Manzanilla [a]

"Pigs that were **cross-fostered** once were 11.69 times more likely to die"

"**Males** were 2.27 times less likely to receive a score of zero for tail biting compared with **female** pigs"

"There was an increased risk of lameness for pigs born to **gilts**"

Piglet performance and immunity is determined by the parity of both the birth dam and the rearing dam

Y. J. Miller [A F], A. M. Collins [B], D. Emery [C], D. J. Begg [C], R. J. Smits [D] and P. K. Holyoake [E]

+ Author Affiliations

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"**Gilt** progeny had a reduced IgG response post-weaning"

"**Gilt** progeny appear to have a greater susceptibility to disease"

Objective

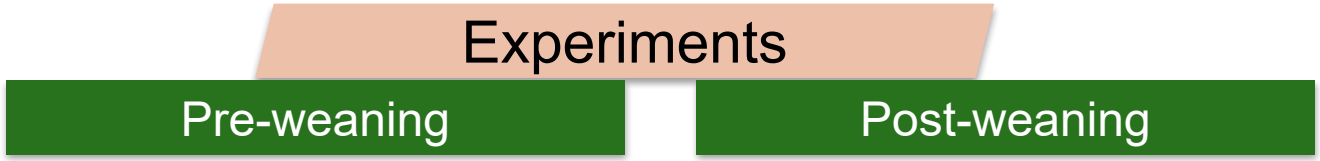
Investigate early life characteristics and experiences of individual pigs, and identify factors that are common in those that develop ear lesions

Materials and Methods: Animals

- 1278 piglets born to 94 sows in 6 batches

March ‘22 → January ‘23

Moorepark Pig Research Unit



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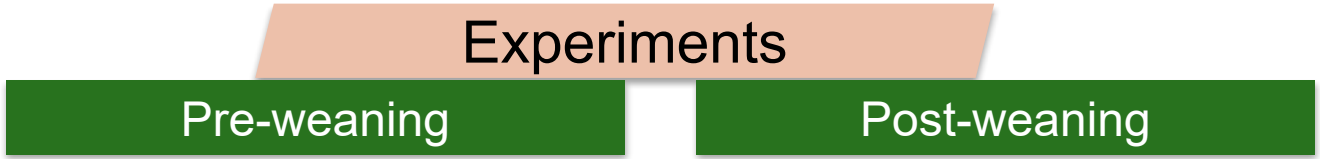


Materials and Methods: Timeline & Measures

Farrowing house

Weaner house (10-12 pigs/pen)

Birth → Weaning (4 wks)

Ear lesion scoring

Transfer to finisher (11 wks)

Early life indicators

Animal factors

- **Sex**
- **Birthweight**
- **Sow parity**

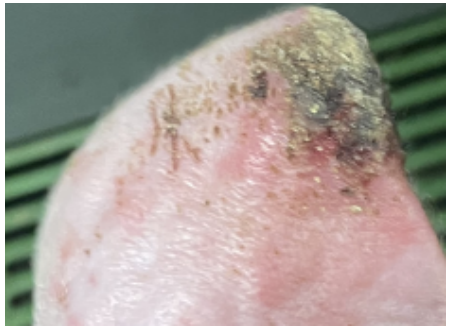
External factors

Suckling period:

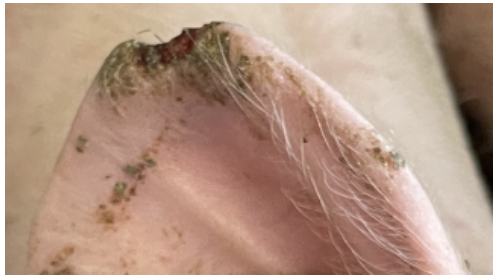
- **Handled** (Yes/No)
- **Antibiotic treatment** (Yes/No)

Ear Lesion Scoring

Score 1 *Small* red and brown scabs/lesions dispersed across the top 1/3 of the ear, not forming a singular lesion yet



Score 2 Red/bloody scab/lesion, or black coloring, usually along the outline/edge of the ear tip – forming, or has formed, a singular lesion – *no ear loss*



Score 3 progression of necrotic lesions with disruptions to the shape of the ear, or small chips out of the ear, though ear still largely intact

Score 4 More extensive progression of necrotic lesions associated with fresh blood, bloody scabs – more substantial ear loss

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Ear Lesion Scoring

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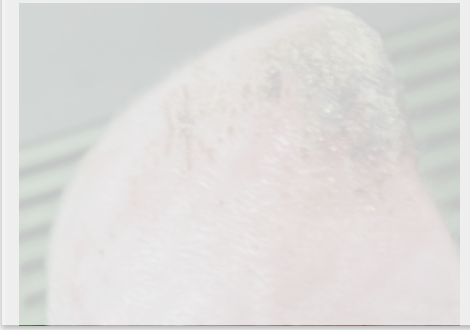

Score 2 Red/bloody scab/lesion, or black coloring, usually along the outline/edge of the ear tip – forming, or has formed, a singular lesion – *no ear loss*

SEVERE

Score 3 progression of necrotic lesions with disruptions to the shape of the ear, or small chips out of the ear, though ear still largely intact

Score 4 More extensive progression of necrotic lesions associated with fresh blood, bloody scabs – more substantial ear loss

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Ear Lesion Scoring

External Factors: Handling

Control pigs	**Handled** pigs
3 batches (n = 589)	3 batches (n = 689)
Handled **3 times** throughout the suckling period	Handled **8 times** throughout the suckling period

Control pigs	**Handled** pigs
3 batches (n = 589)	3 batches (n = 689)
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Birth

1

Processing

2

Weaning

3

Control pigs

3 batches (n = 589)

Handled **3 times**

Handled pigs

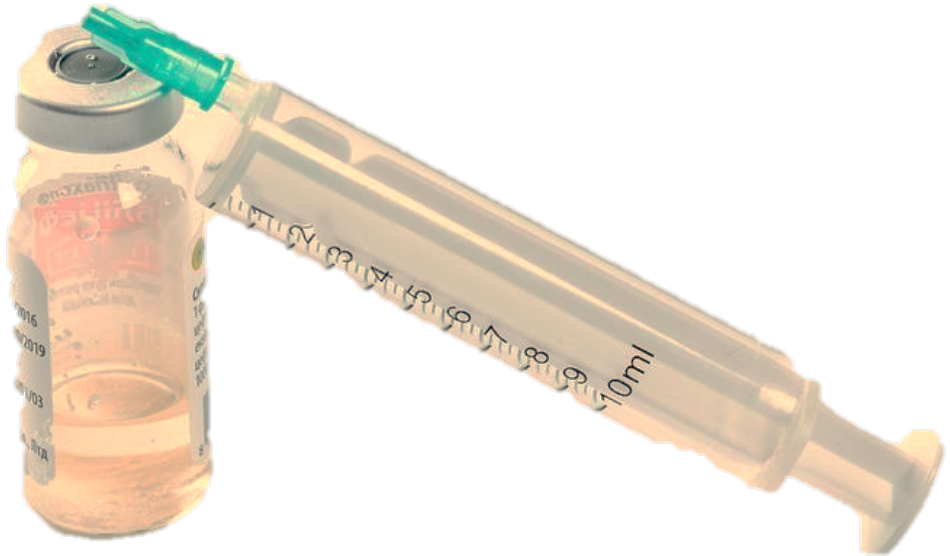
3 batches (n = 689)

Handled **8 times**

Weighed an additional 5 times

External Factors: Antibiotics

- All antibiotic usage was regularly recorded (routine farm practice!)



Statistical analysis

- Generalized linear mixed models (PROC GLIMMIX), Fisher's exact test, and descriptive statistics

To investigate the effect of:

- Sex
- Birthweight
- Sow parity
- Handled
- Antibiotics

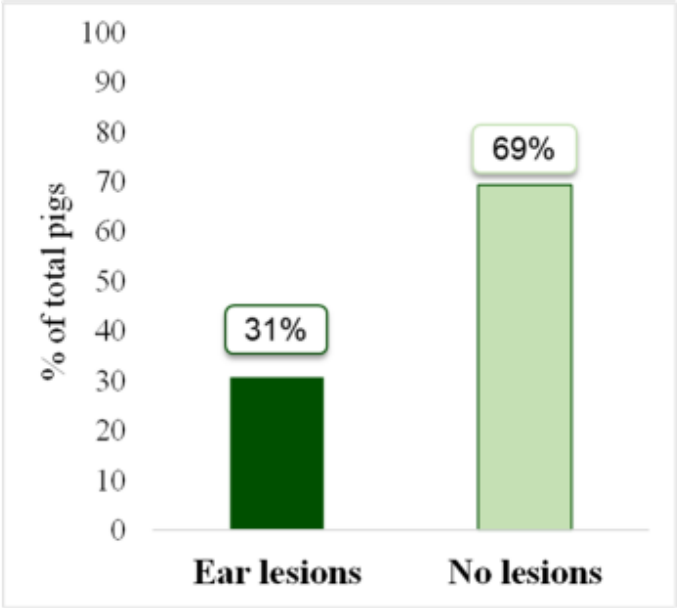
Ear lesions of any score

All lesions

Severe ear lesions

Severe lesions

Results: Proportion of pigs with each lesion severity



Results: Effect of sex and birthweight on ear lesions

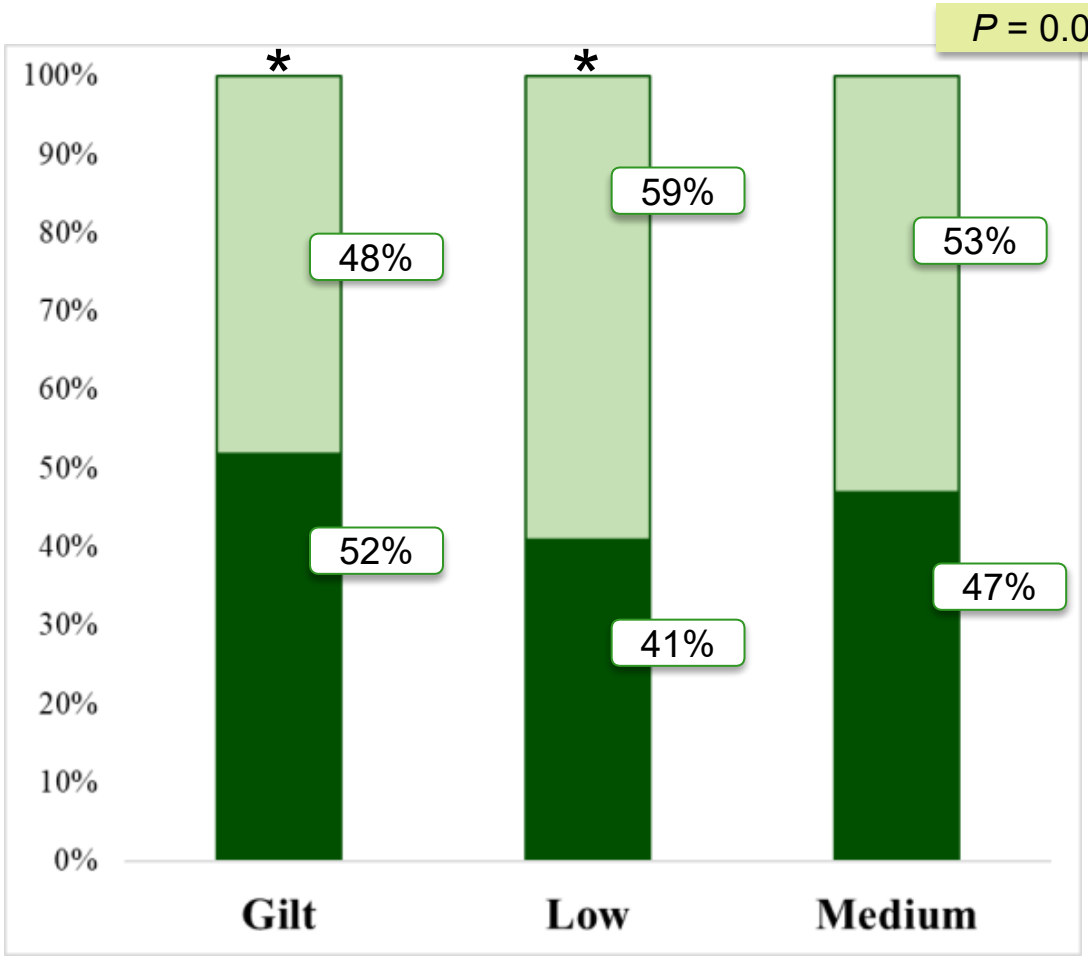
- There was no difference in number of pigs with ear lesions between **females and males** (*P* > 0.05)

- There was no effect of **birthweight** on ear lesions (*P* > 0.05)

Results: Effect of sow parity on all ear lesions

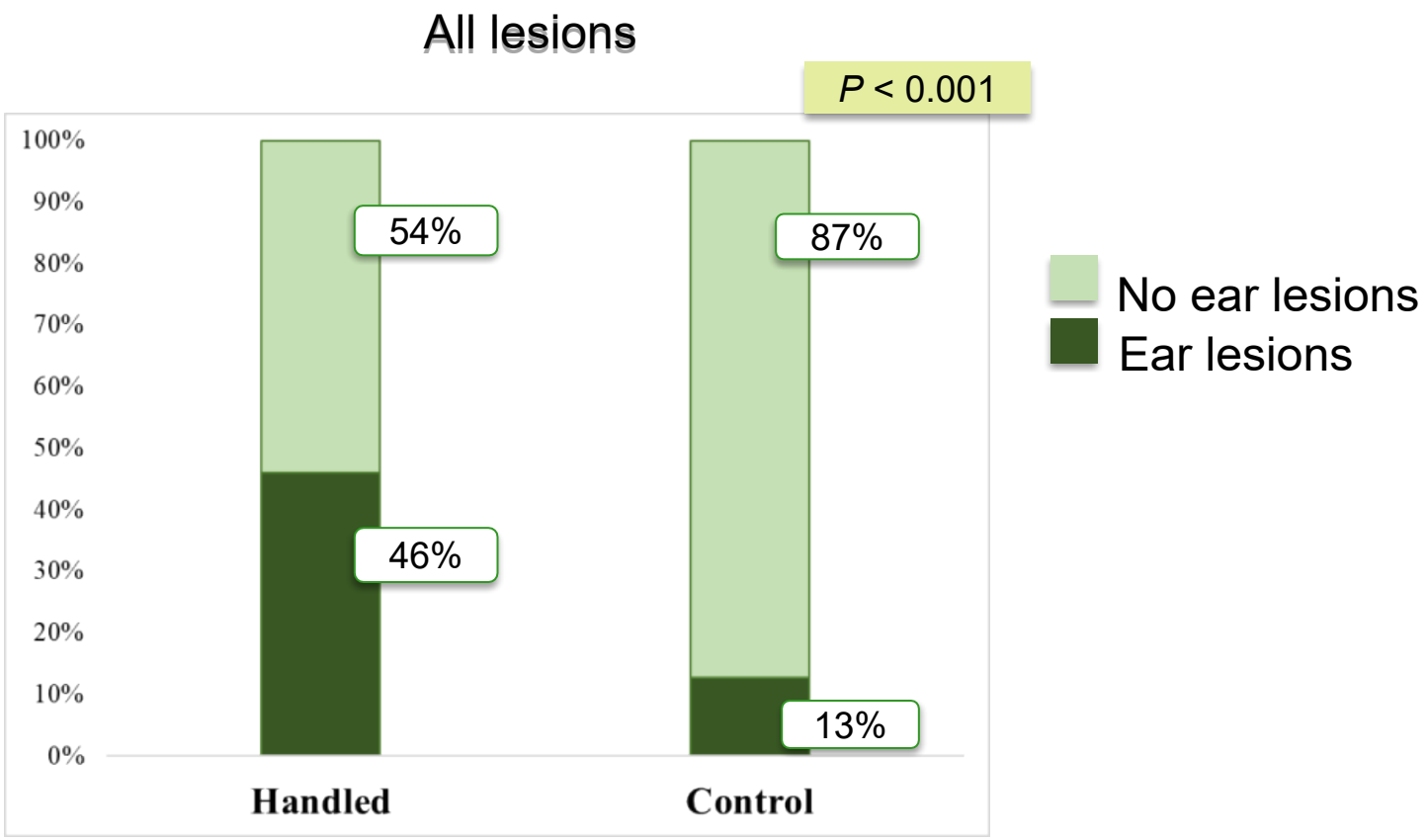
Parity groups

‘**Gilts**’ = Parity 0
‘**Low**’ = Parity 1, 2
‘**Medium**’ = Parity 3, 4, 5, 6

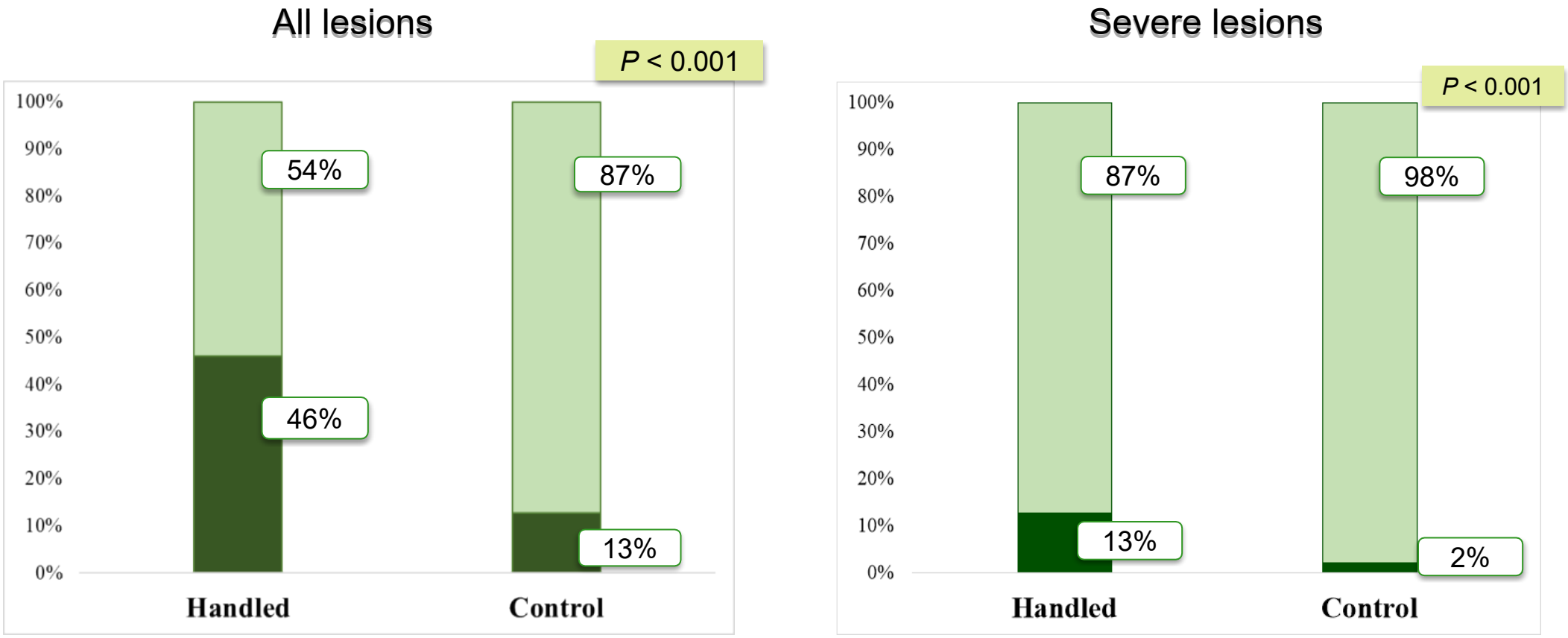


There was no difference in severe lesions between the parity groups

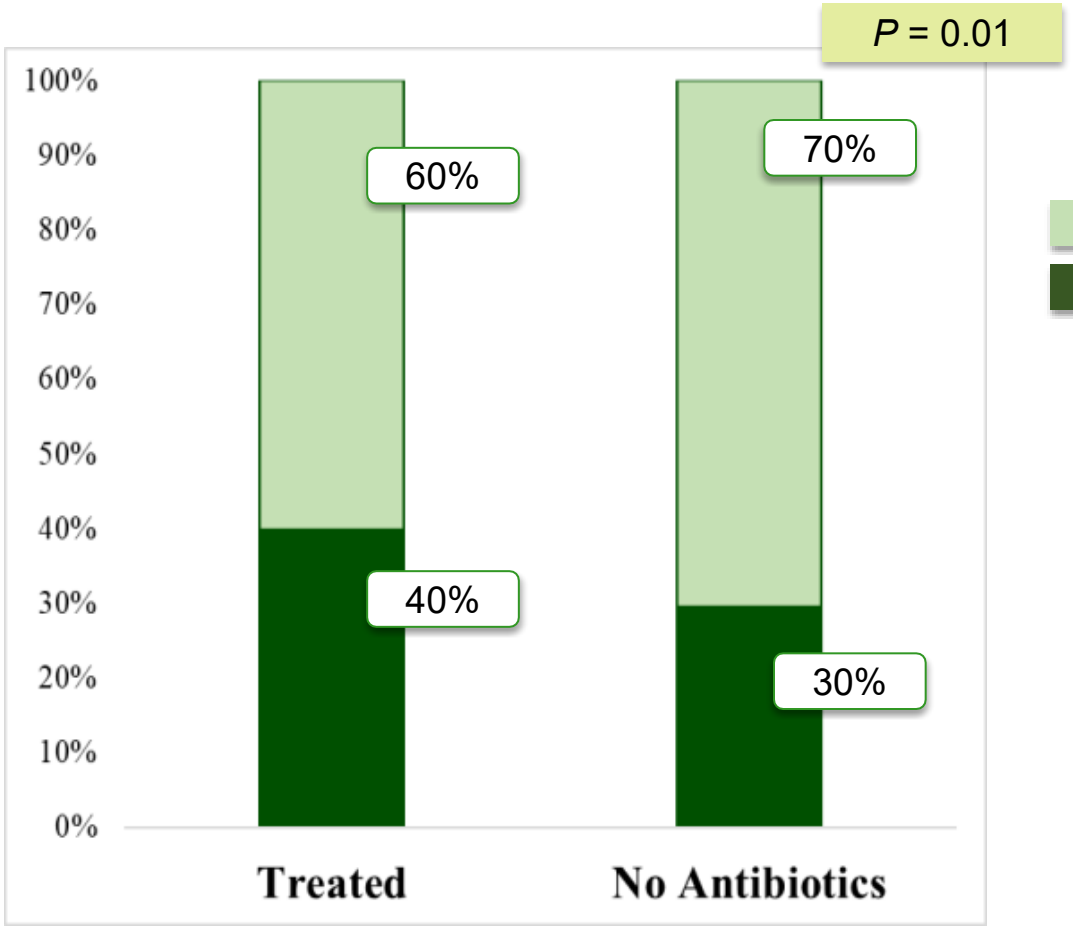
Results: Effect of Handling on ear lesions



Results: Effect of Handling on ear lesions



Results: Effect of Antibiotic treatment on ear lesions



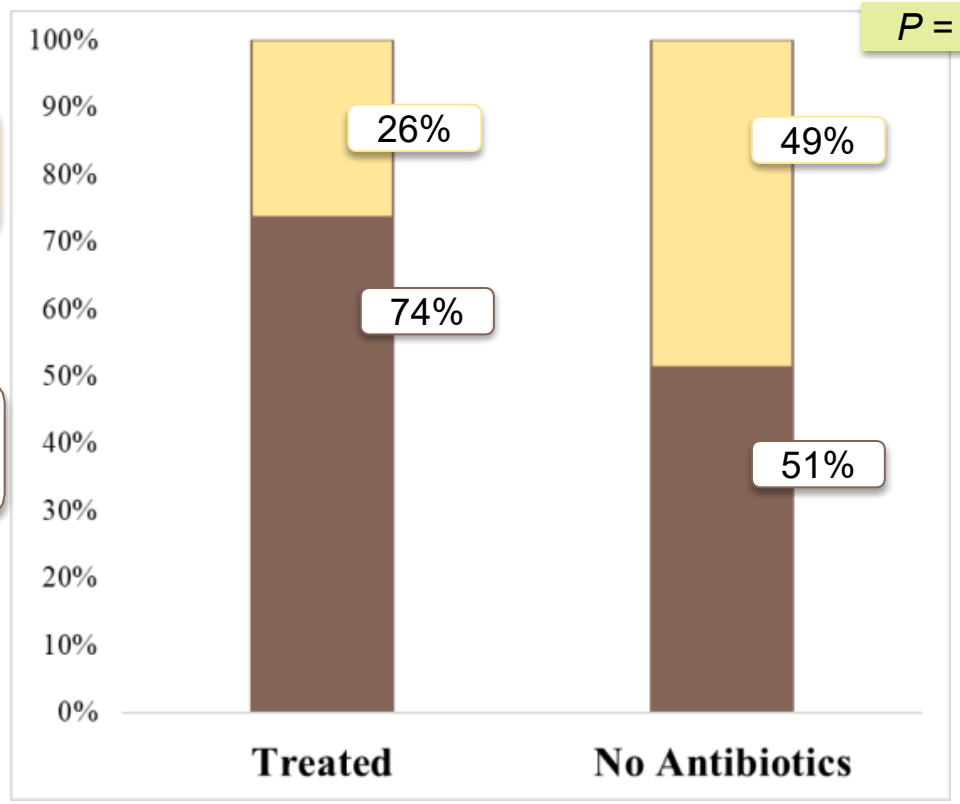
No ear lesions
Ear lesions

There was no difference in severe lesions between treated and pigs that were not treated

Results: Effect of handling on antibiotic treatment

39 **Control** pigs treated

109 **Handled** pigs treated



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Discussion

- Potential for more ear necrosis in gilt offspring
- While ear necrosis is a multifactorial issue, it seems to be exacerbated by frequent handling of piglets during the suckling period
  - Stress induced immunosuppression given the increased antibiotic use in Handled piglets

"…the unpleasant handling treatment resulted in a chronic stress response, with consequent adverse effects on reproduction."

- However, as some of these factors are related to each other, further research is needed to elucidate the individual impact of each

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Thank you for your attention!

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- Moorepark pig unit staff
- Fellow pig department students
- The pigs

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