Boar carcass skin lesions reflect their behaviour on farm

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PIGWELFIND

• Acronym for ‘Pig Welfare Indicators’ (or ‘Finding Pigs Well’!)
• DAFM Research Stimulus Fund
• Collaborative team of researchers
• Overall objective:

To develop ante and post mortem meat inspection as a pig welfare diagnostic tool
Introduction

• Presence of boar taint in pork → Castration
• Pain, discomfort → raises ethical and welfare concerns
• Voluntary EU level ban on castration (2018)
• Rearing of boars poses challenges
• Growing pigs → performance of undesirable behaviour
• Boars perform high levels of aggressive and mounting behaviours
• The ability to measure lesions on the carcass arising from these undesirable behaviours performed on farm would yield a valuable welfare diagnostic tool
To investigate whether there is a relationship between the aggressive and sexual behaviours performed by boars on farm and skin lesion scores recorded on farm and on the carcass in comparison to gilts.
Materials and Methods

- 70 boars (100.70 ± 0.604 kg) and 71 gilts (99.03 ± 0.582 kg) (from Large White x Landrace sows)
- 5 single-sex groups per gender (14 pigs/group)
- All pigs were ear tagged and tattooed with an individual code to enable identification in the factory
- Mixed, transported and slaughtered as per commercial practice
Materials and Methods

Data collection: two weeks prior to slaughter

- Day -14 and -1: all pigs individually weighed
- Days -13, -9, -7 and -2: (8-10h, 11-13h, 14-16h):

  Behaviour observation

  **Scan sampling (every 3 min)**
  - Posture (lying, sitting and standing)

  **All-occurrence sampling**
  - Aggression (head knock and fight)
  - Harmful (tail, ear and flank bite)
  - Mounting behaviours
Materials and Methods

- Days -14 and -1: skin lesion score
  
  *Sum of severity of each lesion:*
  
  (1) superficial or pale red lesion
  
  (2) red lesion
  
  (3) deep red or extensive lesion

- Scores from all areas → total skin lesion score
- Front of body / Rear of body
Materials and Methods

At slaughterhouse

• Slaughter line: tail lesions (0-4)

  Figure 1. (0) No evidence of tail biting; (1) Healed or mild lesions; (2) Evidence of chewing or puncture wounds, but no evidence of swelling; (3) Evidence of chewing or puncture wounds with swelling and signs of possible infection; (4) Partial or total loss of the tail.

• Loin bruises (0-2)

  Figure 2. (0) No evidence of loin bruising; (1) Moderate loin bruising; (2) Severe or extensive loin bruising.
Materials and Methods

At slaughterhouse

- Cold carcass weight
- Skin lesions: as per Welfare Quality® protocol (0-3)

(0) no visible skin damage, only one lesion greater than 2 cm or lesions smaller than 1 cm
(1) between two and 10 lesions greater than 2 cm
(2) any wound which penetrated the muscle tissue, or more than 10 lesions greater than 2 cm.

The scoring was combined in one score:
(0) all body parts with a score of zero
(1) at least one body part with a score of one
(2) a part with a score of two or more
(3) more than one part with a score of two
Materials and Methods

At slaughterhouse

• Extent of bruises (ITP, 1996):
  • Fighting-type
    ≤10 cm length, linear and tramline and concentrated in high number in the front and hindquarter
  • Mounting-type
    ≥10 cm length, linear and concentrated in the back
  • Handling-type
    all sizes of circular, mottled and irregular distributed along the body

Statistical analysis
Performance and behaviour: PROC MIXED statement
Scores: Kruskal-Wallis test (Proc NPar1Way)
Associations: PROC CORR statement
Results and discussion

- Average daily gain was higher in boars (0.91 ± 0.04 kg) than gilts (0.73 ± 0.03 kg; P<0.001)
Results and discussion

- Boars performed more aggressive and mounting behaviours than gilts

** Behaviour

** P<0.001; *** P<0.0001
Results and discussion

- Lying, sitting and standing behaviours were similar in both genders
Results and discussion

- On Days -14 and -1, rear of body and total skin lesion scores were significantly higher in boars than gilts, respectively.

* $P<0.05$
Results and discussion

- There was no effect of gender on carcass tail lesion (0.47 ± 0.06) and loin bruising (0.62 ± 0.06; P>0.05) scores
- Boar carcasses had higher skin lesion scores and more fighting-type bruises than gilts
Results and discussion

• Actor and recipient of aggressive and of mounting behaviours \((P \leq 0.05)\)

• Actor and recipient of aggressive behaviour \(\rightarrow\) carcass skin lesion scores and fighting-type bruises \((P \leq 0.05)\)

• Recipient of mounting behaviour \(\rightarrow\) carcass skin lesion score \((P \leq 0.05)\)

• No association between being mounted and carcass loin bruises or mounting-type bruises \((P > 0.05)\)

• No association between tail lesion scores and being the recipient of tail biting behaviour \((P > 0.05)\)
Results and discussion

• No association between actor and recipient of aggressive and mounting behaviours and skin lesion scores recorded on the farm \((P>0.05)\)

• No association between skin lesions scored on the farm and at the slaughterhouse \((P>0.05)\)
Boars in single-sex groups perform more aggressive and mounting behaviour than gilts, and these behaviours are reflected in carcass skin lesion scores in both genders.

Skin lesions scored on the carcass were a more sensitive indicator of the individual animal’s behaviour than those recorded on the live animal.

The results reinforce the importance of on-line monitoring of carcass skin lesions in the routine inspection procedures as a diagnostic tool for animal welfare on farm.
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