Relation between sows' aggressiveness post mixing and skin lesions recorded 10 weeks later

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Introduction

- Trend to more group housing due to changes in law and (perceived) welfare advantages
- Market requirements for better animal welfare
- Agonistic interactions within the group to establish a social rank order
- Negative effects on well-being and performance

Possible solution

- Breeding of docile/less-aggressive pigs
- Indicators related to aggressiveness for recording traits at commercial housing
- Skin lesions as indicator for aggressiveness

  (Turner et al., 2006; Stukenborg et al., 2011)
- Heritabilities for skin lesions:
  - 0.14 ± 0.06 (Tönepöhl et al., 2012, unpublished)
  - 0.22 ± 0.07 (Turner et al., 2006)

Objectives

- Relationships between aggressive behaviour post mixing and skin lesions recorded 10 weeks later
  - Aggressive sows → higher scores
  - Submissive sows → lower scores
- Correlations with handling behaviour and reproductive performance

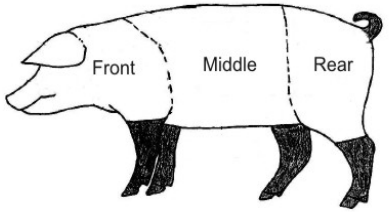
Animals

- Commercial piggery (3-week cycle)
- 7 groups (10 – 20 sows)
- Group housing for pregnant sows (ESF)
- Large dynamic group → Mixings
- 112 German Landrace sows
- 188 behavioural observations
  → repeated measurements (max. 3)
- Reproductive parameters

Methods

- Video analysis of 3 hours post mixing
  - Frequency of behavioural traits (Martin and Bateson, 1993; Turner et al., 2006)
    - Initiator/receiver of agonistic interactions
    - Involvement in reciprocal fights

- Skin lesion score 10 weeks post mixing (Turner et al., 2006; Brown et al., 2009)
  - Severity of wounds and lesions for each body area
  - Score from 1 (no lesions) to 4 (very frequent and severe lesions)



Borberg, 2008

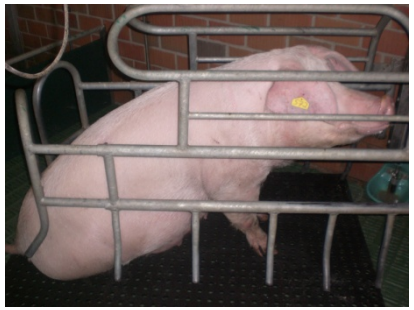
Skin lesions

Score 2

Score 4

Methods

- Separation test (Hellbrügge et al., 2008)
  - Piglets were separated from the sow
  - Sow's reaction: score from 1 (no reaction) to 5 (aggressive towards stockperson)
  - Recorded twice: shortly after birth and 14 d later



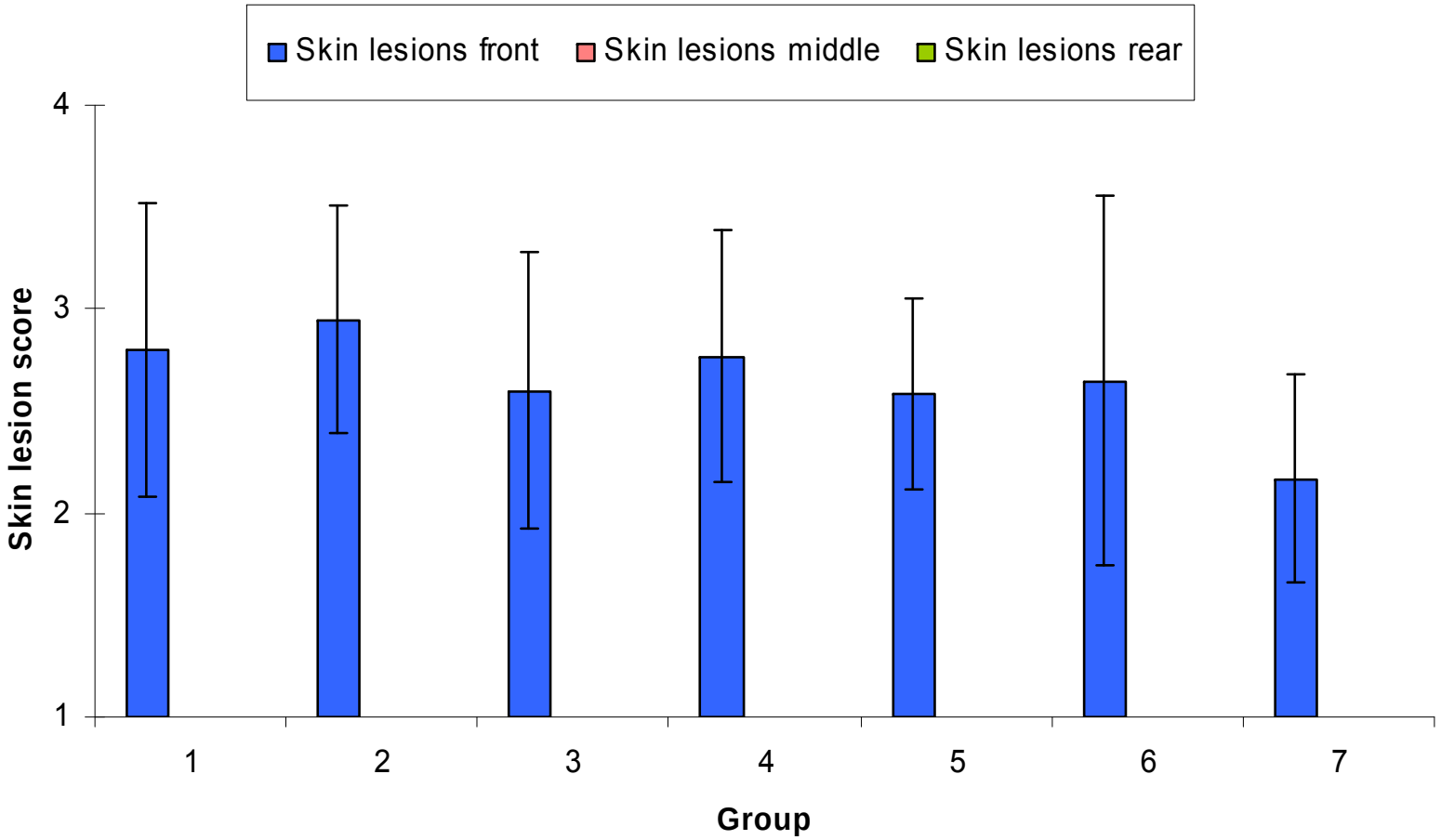
Statistical analysis

- Analysis with SAS 9.3
  - Skin lesion scores pooled for each section
  - Dependent variables: mean skin lesion score front, middle, rear
- Mixed Model including
  - Frequency: Initiator of agonistic interactions
  - Frequency: Receiver of agonistic interactions
  - Frequency: Reciprocal fights
  - Parity classes: parity 1; 2 to 3; 4 to 5; more than 5
  - Group (1-7)
  - Animal

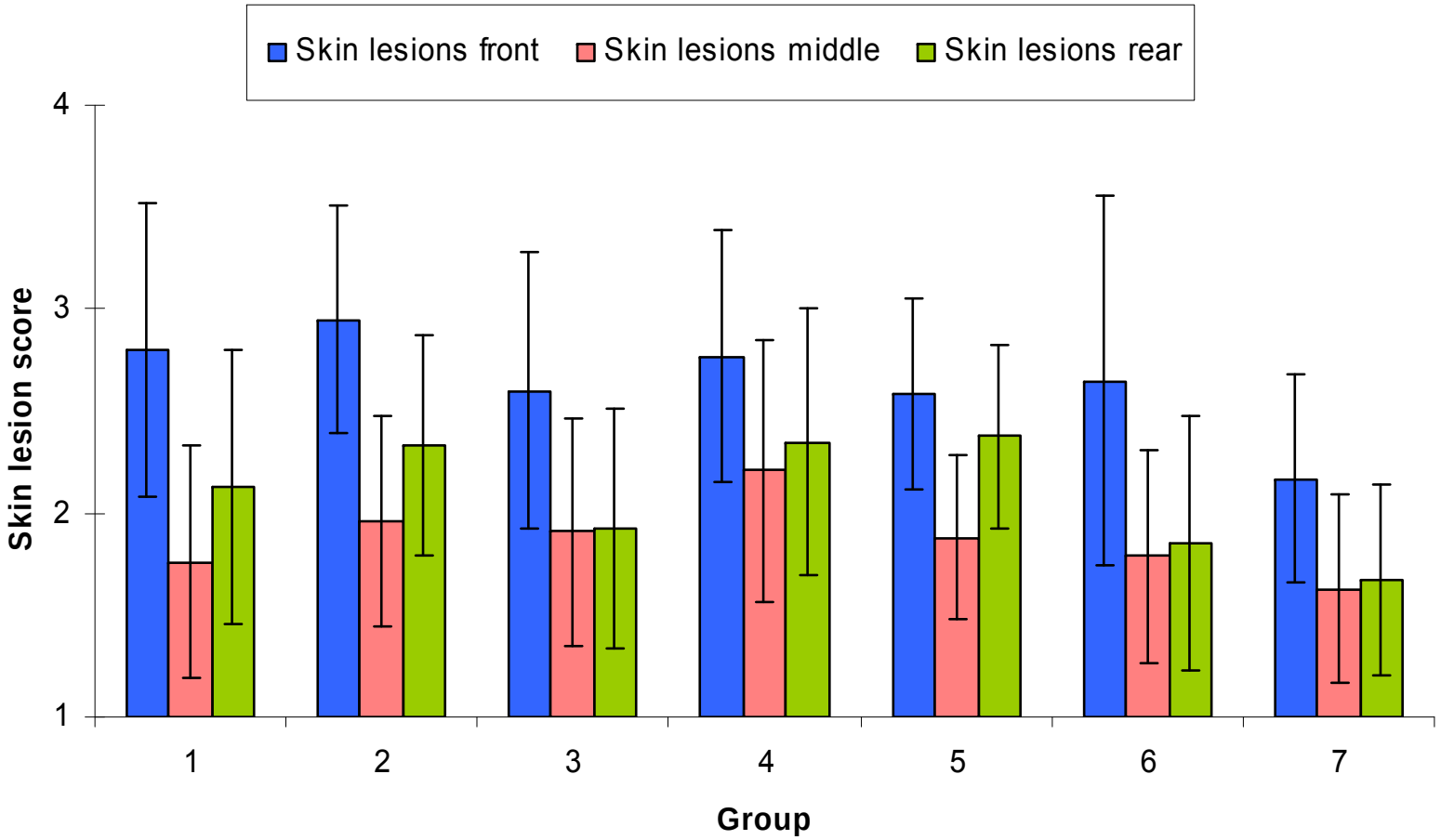
Results

- Skin lesions are not related to frequency of being aggressor
- Contrary: More frequent receivers had higher skin lesions (e.g. skin lesions front, $p = 0.0435$)
- Group effect ($p = 0.0228$)

Results


Skin lesions front
Skin lesions middle
Skin lesions rear
Skin lesion score
4
3
2
1
1
2
3
4
5
6
7
Group

Results


Skin lesions front
Skin lesions middle
Skin lesions rear
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7
Group

Phenotypic correlations among behaviour traits

		Aggressiveness					Handling	
		AGG	REC	RF	LSF	LSM	LSR	BS1	BS2
Aggressive-ness	AGG		-0.07	**0.43**	**-0.13**	-0.08	-0.05	0.10	0.07
	REC			**0.33**	**0.18**	**0.15**	0.10	-0.09	-0.12
	RF				-0.04	0.05	0.01	0.06	-0.04
	LSF					**0.58**	**0.55**	0.01	**-0.21**
	LSM						**0.53**	0.08	-0.09
	LSR							-0.08	-0.10
Handling	BS1								-0.07
	BS2								

AGG: Aggressor of an agonistic interaction; REC: Receiver of an agonistic interaction; RF: Reciprocal fight; LSF: Skin lesion score front; LSM: Skin lesion score middle; LSR: Skin lesion score rear; BS1: Behaviour at the first separation of the litter; BS2: Behaviour at the second separation of the litter.

Phenotypic correlations towards reproductive performance

Reproduction	Aggressiveness						Handling	
	AGG	REC	RF	LSF	LSM	LSR	BS1	BS2
Total born	**0.16**	-0.07	-0.03	**-0.21**	-0.05	-0.06	0.08	-0.02
Live born	**0.17**	-0.07	-0.03	**-0.20**	-0.03	-0.04	0.09	-0.01
Stillborn	0.01	-0.02	-0.02	-0.10	-0.06	-0.07	-0.05	-0.02
Total weaned	0.14	0.01	-0.07	-0.12	-0.01	0.06	0.06	-0.10
Total losses	0.06	0.09	0.05	**-0.18**	-0.06	**-0.18**	0.03	0.10
Average birth weights	0.04	0.08	-0.09	**0.20**	0.08	**0.26**	0.10	-0.07
Average wean weights	-0.03	0.06	0.01	**0.14**	0.03	0.04	-0.01	0.07

AGG: Aggressor of an agonistic interaction; REC: Receiver of an agonistic interaction; RF: Reciprocal fight; LSF: Skin lesion score front; LSM: Skin lesion score middle; LSR: Skin lesion score rear; BS1: Behaviour at the first separation of the litter; BS2: Behaviour at the second separation of the litter.

Conclusion

- Skin lesions recorded 10 weeks post mixing cannot be used as an indicator for individual aggressiveness
- Group effect → Group selection
- Breeding for reduced agonistic interactions may affect handling behaviour and reproductive performance

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