

Does group size have an impact on welfare indicators in fattening pigs?

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Background

- Structural change in the pig fattening sector
 - Shift towards larger farm sizes, coupled with increasing group sizes (FAWC, 2012; Street and Gonyou, 2008)
 - Optimization of management and labour efficiency
- Serious discussion concerning animal welfare in large units/groups (Velarde et al., 2015)



Background

- Possible effects of large group sizes → contradictory results
 - Altered animal behaviour
 - Behavioural vices ↑
 - Morbidity ↑
 - Mortality ↑
 - Injuries ↑

(Rodenburg and Koene, 2007; Samarakone and Gonyou, 2008)



Objectives

- Evaluate the effect of different group sizes on various animal-based indicators in pigs kept under conventional conditions.
- Is group size related with animal welfare?



Material and methods

60 conventional pig fattening farms

➤ Floor

- 92 % fully slatted
- 8 % partly slatted

➤ Feeding system

- 62 % automatic or sensor-controlled liquid feeding
- 38 % dry feeding automats

➤ Space allowance

- Ø 0.83 m²/pig (0.31 to 2.5 m²/pig)





Material and methods

➤ Animals

- Crossbreds of various genotypes
- Sex: 60 % female and castrated pigs in mixed groups
6 % female and boars in mixed groups
34 % separated by sex
- All pigs were tail docked
- Mortality rate $\bar{\emptyset}$ 2.5 % (0.9 to 5.2 %)





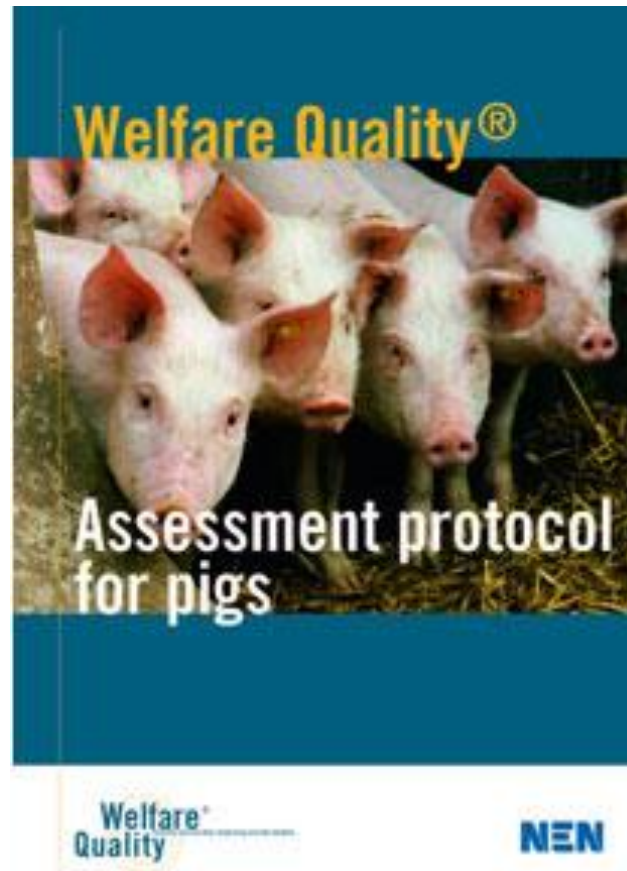
Material and methods

	Group size		
	Small	Medium	Large
Pigs per pen	< 15	15 – 30	> 30
Ø Pigs per group	11.2	21.1	50.7
Number of pens	207	257	136



Assessment of welfare indicators

Welfare Quality[®] Assessment Protocol for Pigs





Assessment of welfare indicators

Welfare Quality[®] Assessment Protocol for Pigs

Assessment	Principles	Criteria	Indicators	
Score	Feeding	01 Hunger	Body condition	
		02 Thirst	Water supply	
	Housing	03 Resting comfort	Bursitis, Manure on the body	
		04 Thermal comfort	Shivering, Panting, Huddling	
		05 Ease of movement	Space allowance	
	Health	06 Injuries	Lameness, Wounds on the body, Tail biting	
		07 Diseases	Mortality, Coughing, Sneezing, Pumping, Twisted snouts, Rectal prolapse, Skin condition, Hernia, Results from slaughterhouse	
		08 Pain	Castration, Tail docking	
		Behaviour	09 Social behaviour	Social behaviour
			10 Behaviour	Exploratory behaviour
	11 Human-animal relationship	Panic response		
	12 Emotional state	Qualitative Behaviour Assessment		



Pen-based indicators

10 pens per farm; max. 15 pigs per pen assessed

Human-animal relationship → Panic response





Animal-based indicators

Bursitis



Manure on the body



Wounds on the body





Statistical analyses

GLIMMIX procedure (SAS version 9.3)

- Model for animal-based indicators at individual level

$$Y_{ij} = \mu + \text{group size}_i + \text{farm}_i + \varepsilon_{ij}$$

- Odds ratios for human-animal relationship



Results and Discussion

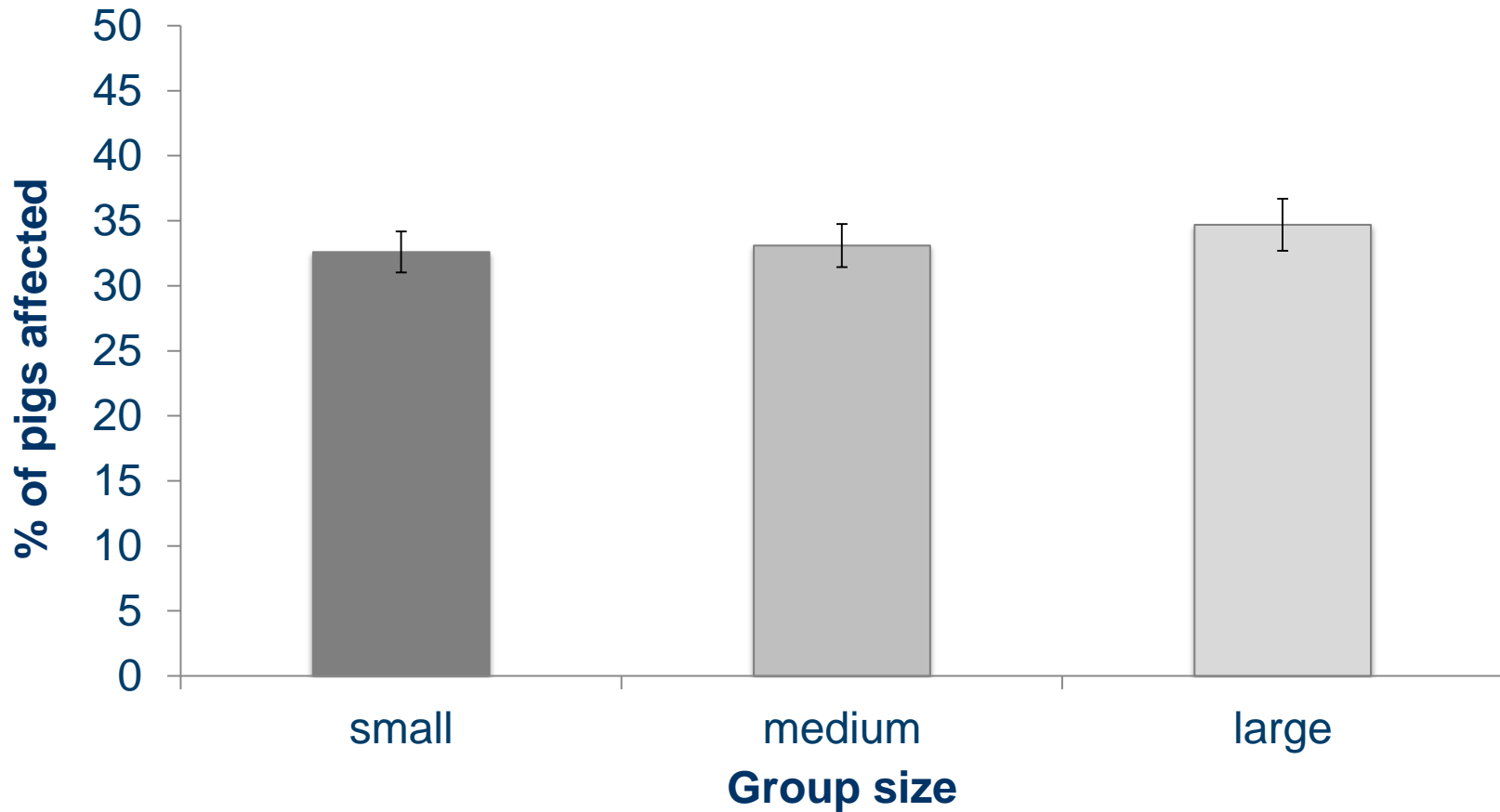


Animal based indicators

Indicator		%	SD
Bursitis	moderate	34.7	± 8.9
	severe	2.7	± 3.3
Manure	moderate	15.5	± 9.9
	severe	6.2	± 6.5
Wounds	moderate	10.5	± 7.5
	severe	1.5	± 2.9
Skin	moderate	0.6	± 0.8
	severe	0.0	± 0.1
Hernia	moderate	0.6	± 0.8
	severe	0.0	± 0.1
Lameness	moderate	0.4	± 0.6
	severe	0.1	± 0.3
Tail biting		1.9	± 2.8
Poor body condition		0.2	± 0.7



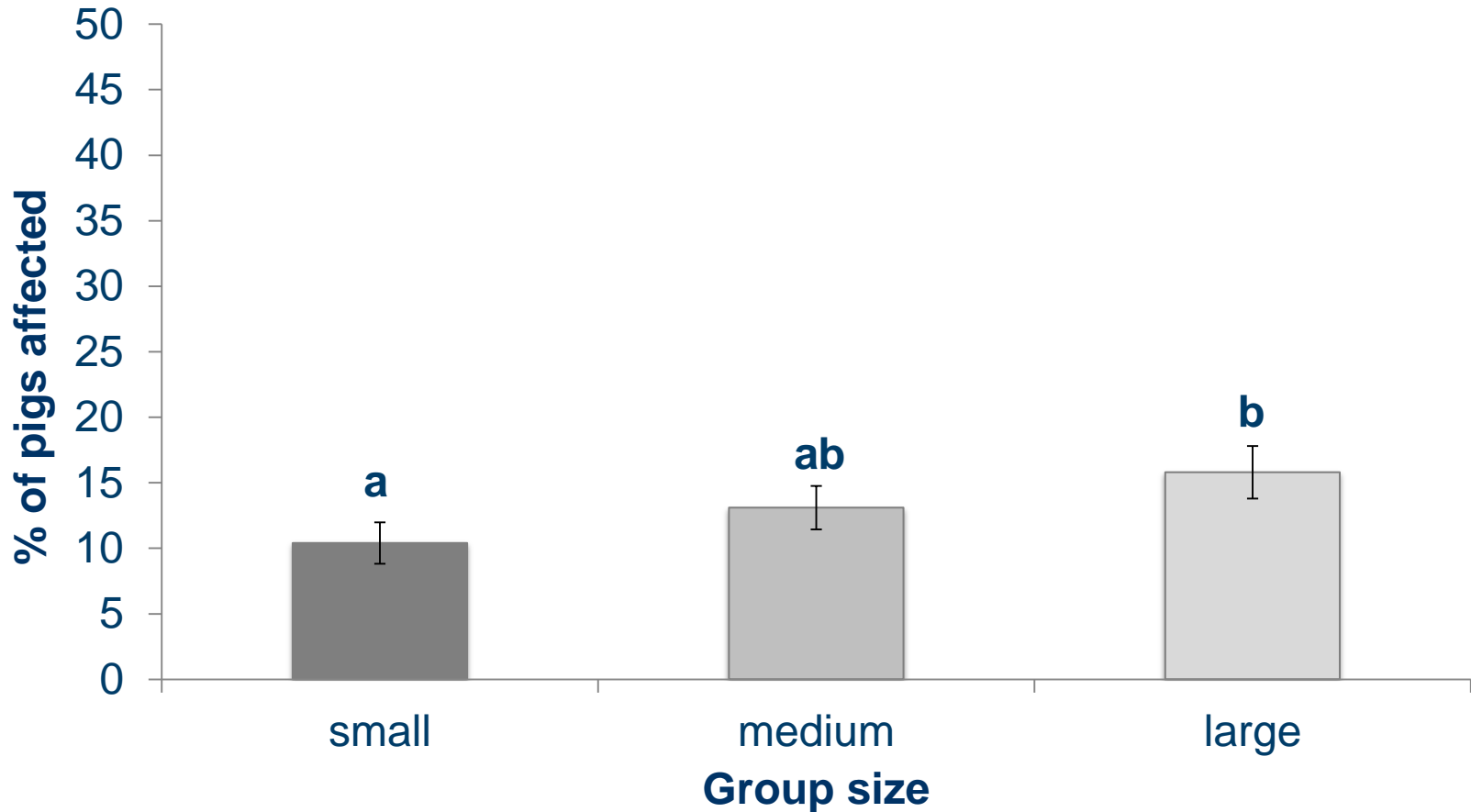
Moderate Bursitis



➤ Most prevalent indicator



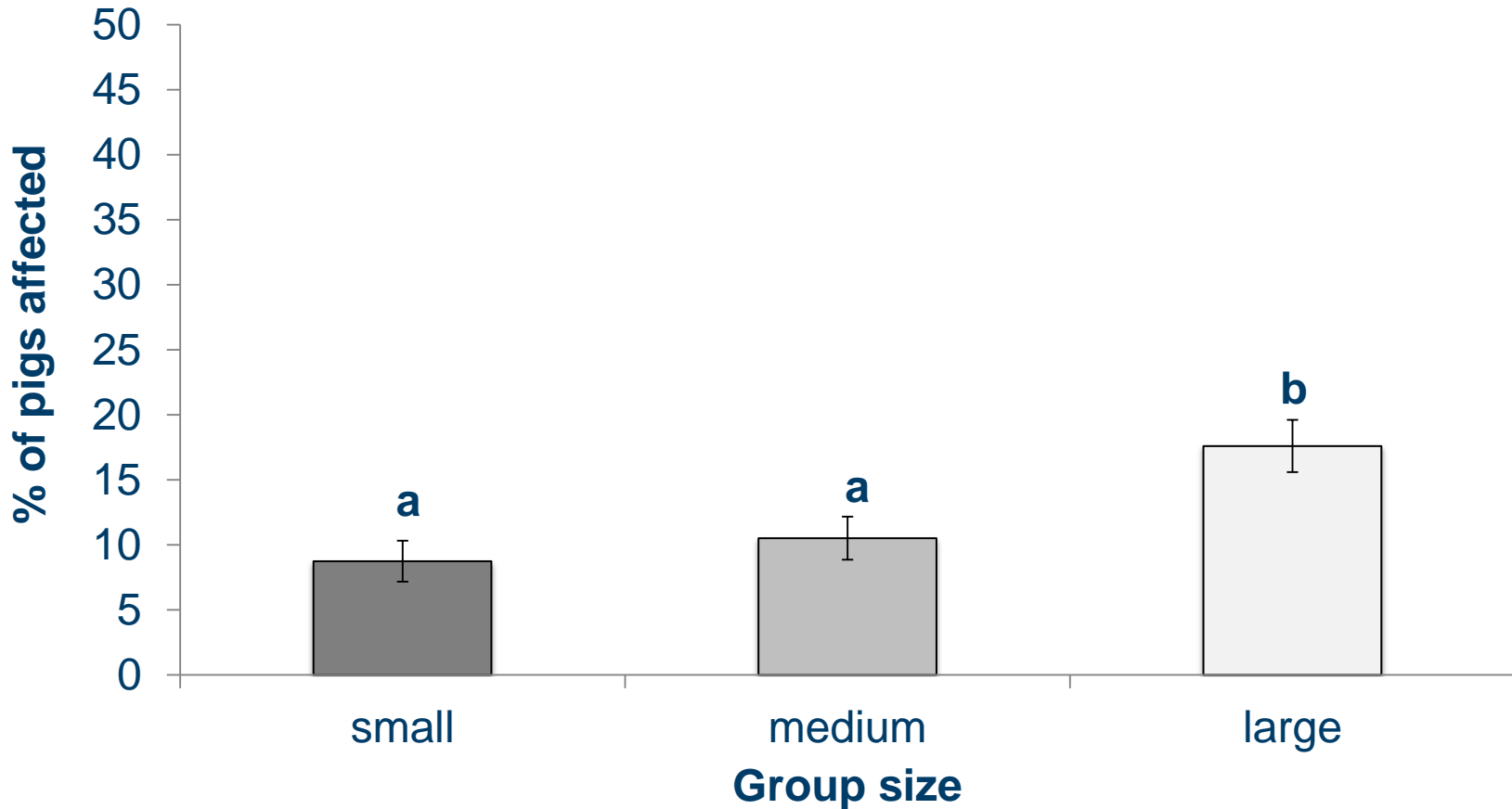
Moderate Manure



➤ Increasing group size → moderate manure ↑ ($p < 0.05$)



Moderate Wounds



➤ Large group size mostly affected → higher risk of agonistic behaviour



Panic response

- A panic response was observed in Ø 14 % of the pens
- Probability of panic response :

Group size	Prevalence of a panic response (%)	Odds Ratio	Confidence intervals (95%)	
Large	6.6	Reference	-	-
Medium	14.0	0.497	0.188	1.313
Small	20.3	0.329	* 0.119	0.908

➤ Large pens → farmer has to walk through the pen for control



Conclusion

Relationship between group size and animal welfare indicators

- Manure on the pigs ↑
 - Wounds on the pigs ↑
 - Panic response ↓
- with increasing group size

- Importance of group size seems to be overestimated !
- Discussion has to focus on other topics !

Thank you for your attention !



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