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The Identification of Farm Characteristics, and Welfare Associated Management Practices, as Potential Risk Factors for the Presence of Pathologies in Slaughtered Finishing Pigs

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Overall objectives

Bring together information from existing industry databases.

Perform epidemiological analysis to investigate farm husbandry factors affecting animal health and welfare.

Approach to welfare

Pig welfare aspects were investigated in 2 ways:

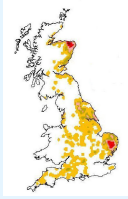
-Facilities-based welfare: the effect of "welfare friendly" husbandry practices on three main pig health conditions (Enzootic pneumonia-like (EP) lesions, pleurisy and milk spots).

-Animal-based welfare: the effect of the husbandry practices on the occurrence of tail damage as a proxy animal welfare indicator.

Databases used

Farm information from the three main UK QA programmes (Quality Meat of Scotland, Assured British Pigs and Genesis QA):

- Certify the compliance of their members with the agreed standards of pig production.
- Collect and document information on farm production descriptors.



Databases used

Health information from the two main UK health schemes (Wholesome Pig Scotland and British Pig Health Scheme):

- Investigate the presence of twelve different conditions detected in the slaughtered pig.
- Inspections are carried out by swine veterinarians.

(data used from Oct 2005 to Sep 2007).

Database merge results: the variables

- Flooring characteristics:
  - Full-slatted.
  - Part-slatted.
  - Solid Floor with bedding.
- Use of wet feeding.
- Number of sows and finishing pigs.
- Having a breeding herd in the farm.
- Use of outdoors production.
- Pig farm density in the area.
- Area where the farm is located:
  - Scotland, North England, East Anglia and South West.

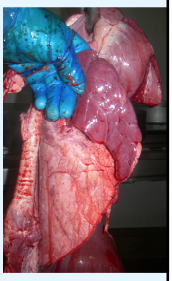
Welfare related husbandry

Statistical Analysis

- The lesions were studied as binary response; considering the absence as a baseline.
- The variables were included in a generalized linear mixed model, and potential clustering at the farm and batch level were investigated.
- Temporal variations were also investigated in the model in three time periods: monthly, quarterly and six monthly.

Multivariable mixed model including variables associated with presence of EP-like lesion in finishing pigs and allowing for random effect at batch level. n=505 farms.

Farm variable	Level	Odds ratio	95% CI
Part slatted floor		1.44	1.21 - 1.72
Solid floor with bedding		0.79	0.66 - 0.94
Log number of finishers		1.17	1.07 - 1.27
Region	Scotland	Baseline	–
	North	3.27	2.63 – 4.07
	South East	2.25	1.81 – 2.81
	South West	4.23	3.23 – 5.53
Farm density category	High	Baseline	–
	Median	0.39	0.28 - 0.52
	Low	0.31	0.23 - 0.41

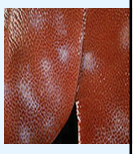


Multivariable mixed model including variables associated with presence of pleurisy lesion in finishing pigs and allowing for random effect at batch level. n=505 farms.

Farm variable	Level	Odds ratio	95% CI
Part slatted floor		1.27	1.08 - 1.44
Solid floor with bedding		0.71	0.64 - 0.82
Wet feeding		1.48	1.28 - 1.71
Breeding herd on the unit		1.33	1.17 - 1.51
All production Indoors		0.72	0.59 - 0.87
Health Scheme (Area)	Scotland England and Wales	Baseline 1.51	– 1.30 - 1.76
Farm density category	High	Baseline	–
	Median	0.4	0.31 - 0.50
	Low	0.42	0.33 - 0.53

Multivariable mixed model including variables associated with presence of milk spots lesion in finishing pigs and allowing for random effect at batch level. n=505 farms.

Farm variable	Level	Odds ratio	95% CI
Full slatted floor		0.49	0.45 - 0.53
Part slatted floor		1.39	1.28 - 1.51
Solid floor with bedding		1.22	1.11 - 1.34
Number of finishers		0.99	0.99 - 0.99
Wet-feeding		0.79	0.72 - 0.87
Breeding herd on the unit		0.66	0.61 - 0.72
All production Indoors		0.39	0.35 - 0.47
Region	East Anglia	Baseline	–
	North England	3.92	3.55 - 4.32
	Scotland	3.49	3.15 - 3.86
	South West England	3.07	2.72 - 3.47
Season	Spring	Baseline	–
	Autumn	1.62	1.48 - 1.78
	Summer	1.30	1.19 - 1.43
	Winter	1.18	1.08 - 1.29



Discussion

The use of partly slatted floor appears as a potential risk factor for EP, pleurisy and milk spots; while the use of solid floor with bedding appears to be potentially protective against respiratory conditions but a risk factor for presence of milk spots:

- Straw might have an insulating effect helping to prevent respiratory diseases.
- However straw might also help the *A. suum* eggs to survive in the floor.
- Flooring type could be a proxy for the building type. In Britain partly slatted flooring is more common in 20-30 year old buildings with low ceilings and poorer ventilation; which may result in less than optimal environment.

Multivariable mixed model including variables associated with presence of tail damage lesion in finishing pigs and allowing for random effect at batch level. n=505 farms.

Farm variable	Level	Odds ratio	95% CI
Full slatted floor		1.66	1.35 - 2.03
Solid floor with bedding		0.69	0.57 - 0.79
Number of finishers		0.99	0.99 - 0.99
Wet-feeding		2.88	2.43 - 3.43
Breeding herd on the unit		0.51	0.42 - 0.61
All production Indoors		0.23	0.19 - 0.29
Region	East Anglia	Baseline	–
	North	0.51	0.42 - 0.62
	South West	0.60	0.48 - 0.76
	Scotland	0.54	0.43 - 0.68
Time	First semester	Baseline	–
	Second semester	0.68	0.59 - 0.79

Discussion

The use of solid floor with bedding seems to be protective against tail damage; while the use of full slatted floor seems to be a risk factor.

- These findings might reflecting a genuine welfare effect of the use of straw on pig behaviour; helping to satisfy the foraging motivation that is otherwise redirected to tails.

The use of outdoors production appears to have a negative impact on the occurrence of tail damage.

- This finding could reflecting a post weaning stress effect due to the mixing and re-grouping indoors of the those piglets farrowed and nursed outdoors.

Summary

This study gives a wide picture of the potential effect of some farm husbandry practices on pig welfare in British production.

Dealing with variable quality farm data (that was not collected *ad hoc* for this study) introduces limitations in the study and the results need to be interpreted with caution.

Initiatives to improve the recording of the farm information could facilitate the implementation of these approaches for better routine monitoring of pig health and welfare.

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