

# THE BEHAVIOUR OF PIGS IN LAIRAGE IN RELATION TO THEIR POST-WEANING MANAGEMENT: RESULTS OF A POSTAL SURVEY

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## Abstract

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Lairage staff at 11 abattoirs were asked to rate which producers regularly provided pigs which were 'easy' (EH) or 'difficult' (DH) to handle, on a scale of one (very DH) to five (very EH). A postal questionnaire, dealing with various aspects of post-weaning farm management, was then given to the four or five producers sending the most EH and the four or five producers sending the most DH pigs to each abattoir. Of 105 questionnaires sent, information on 26 EH and 27 DH systems was returned. The median number of replies per abattoir was two for both EH and DH systems. In most systems (77%) pigs experienced three or four housing stages from weaning to slaughter. In each of the first five housing stages, more EH pigs had access to daylight (mean of 86%  $\pm$  11.5 (SD)) than DH pigs (mean of 64%  $\pm$  10.1 (SD),  $P < 0.05$ , two-sample *t* test). More EH systems provided straw in the first three housing stages, although over all stages the difference was not significant. During housing stage two, the difference in provision of straw between the systems was most marked, with 58 per cent of EH and 27 per cent of DH systems providing straw. Distance walked between housing stages three to four and four to five was significantly greater for EH compared to DH systems (EH mean of 64m  $\pm$  24.1 (SD), versus DH mean of 22m  $\pm$  14.0 (SD), and EH mean of 73m  $\pm$  17.2 (SD), versus DH mean of 23m  $\pm$  8.5 (SD),  $P < 0.001$  and 0.01 respectively, two-sample *t* test). At loading for pre-slaughter transport, moving from daylight to daylight conditions occurred in 65 per cent of EH and 25 per cent of DH systems. Overall, the results provide circumstantial evidence that environmental factors can affect ease of handling, and hence pig welfare during pre-slaughter transport and lairage.

**Keywords:** animal handling, animal welfare, pig, pre-slaughter stress

## Introduction

Farm environment and management procedures can affect the behaviour of pigs in a variety of ways. For example, positive handling, involving patting and stroking of pigs can result in greater willingness to approach people (Hemsworth *et al* 1996) and environmental enrichment can reduce levels of harmful social behaviour such as tail biting (Beattie *et al* 1996). Recent work at Cambac JMA Research has been prompted by the observation of hauliers and lairage staff that some farms consistently produce pigs which are either easier or more difficult to handle. This research has focused on the welfare implications of pigs being unwilling to move during pre-slaughter handling, as these pigs may react more

adversely to pre-slaughter transport and handling than pigs which are willing to leave their farm pens with little human intervention. There is also some evidence that carcasses from difficult to handle pigs develop *rigor mortis* more quickly, have more skin blemish, darker muscle and higher ultimate pH (Weeding *et al* 1993) all of which suggest a greater susceptibility to the stressors of loading, transport and pre-slaughter lairage. Improvements in ease of movement and *post-mortem* measures of stress-susceptibility have been obtained by moving pigs in pen groups twice during the month before slaughter (Abbott & Hunter 1994; Abbott *et al* 1994). To complement experimental work on ease of handling, a survey of farms was carried out to investigate which farm management practices, if any, were associated with degree of 'handleability' in the immediate pre-slaughter period, as determined by the subjective opinion of experienced lairage staff.

## Materials and methods

### *Survey methods*

The survey was carried out via 11 abattoirs. In each case, the lairage staff were asked for their opinion regarding pigs from the four or five farms which regularly sent pigs that were easy to handle (EH) and the four or five farms which sent pigs that were most difficult to handle (DH). Farms were scored on a scale from one (very DH) to five (very EH). A postal questionnaire, concentrating on management procedures during the post-weaning stages, was sent to farms scoring one or two (DH) and four or five (EH) with a covering letter containing advice on how to answer the questions, and an explanation of why the survey was being conducted. Contact was made either directly, or via abattoir management if confidentiality was preferred.

The following information was collected separately for each housing stage: general housing type (eg straw yard, kennel), pen environment (eg access to straw and natural light), feeding method, moving and weighing of pigs within this stage, group size, time (weeks) spent in this stage, distance (m) to the next housing stage, and whether pigs walked or were transported by barrow or trailer to the next housing stage. Pigs moved within and between housing stages were subject to varying degrees of mixing and changes in group size. For example, pigs moved into kennels in groups of 30 after weaning were often split into two groups of 15 and moved into neighbouring kennels within the same building after two to four weeks. Movements of this type were categorised as 'movements within housing stages' whereas movements from one building type to another were categorised as 'movements between housing stages'. Of 105 questionnaires sent out, replies were received representing a total of 26 EH and 27 DH production systems. The median number of replies per abattoir was two for both EH and DH systems.

### *Statistics*

Many of the data collected were not suitable for statistical analysis, and are therefore presented in summary form. Where EH and DH means could be calculated, using one value per housing stage, these were compared using two-sample *t* tests to illustrate any differences between the two categories.

### *Source of breeding stock*

Seven breeding companies were represented and stock from four of these was used to produce 70 per cent of the pigs destined for slaughter. Eight systems, three EH and five DH, used homebred gilts to produce a proportion of slaughter pigs. In 12 systems (seven EH and

five DH) the breeds of gilts and boars being purchased indicated that the breeding herd was being kept outdoors. No trends relating source of breeding stock to ease or difficulty of handling were evident.

## Results

### *Housing from weaning to slaughter*

The majority of pigs (77%) experienced three or four housing stages from weaning to slaughter, regardless of behavioural type (EH or DH) (Table 1).

**Table 1** Number of 'easy to handle' (EH) and 'difficult to handle' (DH) systems represented in each rearing/finishing housing stage.

System	Housing stage					
	1	2	3	4	5	6
EH	26	24	19	13	5	1
DH	27	26	22	10	4	0

Group size and time spent in each housing stage were very variable. The number of different housing stages experienced by the pigs varied from one to six (Table 1), although only three systems (one DH and two EH) involved a single housing stage and only one system (EH) involved six. Group size and time spent in each housing stage were not significantly different (two-sample *t* tests) between EH and DH systems. For each stage, producers were asked to indicate general housing type. The total occurrence of each housing type, based on a tally of all stages in all systems, is contained in Table 2. Where 'other' was ticked, without an explanation of building type being given, questions on size of pens and access to straw and natural light provided some information on pen environment.

**Table 2** Occurrence of each housing type in EH and DH systems (percentage based on a tally of all stages in all systems).

Housing type	EH %	DH %
Pigibox <sup>1</sup>	2.3	3.5
Straw yard	24.3	17.0
Weaner/grower bungalow <sup>2</sup>	3.4	6.8
Weaner/grower verandah <sup>3</sup>	11.5	5.7
Weaner/grower kennel <sup>4</sup>	33.3	13.6
Flatdeck <sup>1</sup>	5.7	13.6
Fully-slatted finishing	1.1	9.1
Part-slatted finishing	18.4	14.8
Other	0	15.9

<sup>1</sup> Fully-enclosed, environmentally-controlled buildings containing a number of pens with mesh floors. In Pigiboxes, there is more than one layer of pens

<sup>2</sup> One of a free-standing row of pens, consisting of a kennel with hinged monopitch roof, and pophole leading to a drink/dung area, with mesh or slatted floor. In the stage immediately post weaning the kennel floor may be heated

<sup>3</sup> Two rows of bungalows, back to back within a building. A central feeding passage runs between the two rows, and the roof of the building may extend over the outside dunging areas of the two rows

<sup>4</sup> Similar to <sup>3</sup>, but the indoor lie/feed area of each pen is not kennelled

Straw yards, verandahs, kennels, and part-slatted finishing pens were more common in EH systems, whereas Pigiboxes, flatdecks, bungalows, and fully-slatted finishing pens were used more in DH systems. Analysis of access to straw and natural light indicated whether these variations in building type had a significant effect on the environment experienced by pigs in EH and DH systems.

#### *Access to natural light and straw*

In each of the first five housing stages, a significantly higher percentage of EH systems (mean of 86%  $\pm$  12% (SD)) provided access to natural light compared to DH systems (mean of 64%  $\pm$  10% (SD),  $P < 0.05$ , two-sample  $t$  test). There was no significant difference over all housing stages in terms of access to straw, although the proportion of EH units with access to straw was greater in the first three housing stages. This difference was most marked in housing stage two, during which 58 per cent of EH and 27 per cent of DH systems provided access to straw.

#### *Feeding system*

Feeding systems in each housing stage were characterized as either manual, semi-automatic or automatic. With the exception of housing stage three, in which automatic and semi-automatic feeding were most common, at least half of all systems in each housing stage used manual feeding. There was no significant difference between EH and DH systems in this respect.

#### *Moving and weighing of pigs*

Pigs either walked, or were moved by barrow or trailer from one housing stage to the next. In some cases they were moved within a housing stage, either when groups were moved to larger pens or when larger groups were split. There was no significant difference between EH and DH systems in terms of movement within housing stage. With one exception, (pigs in DH systems being moved from housing stages one to two) the majority of pigs were walked from one housing stage to the next, regardless of behavioural type (EH or DH). The distance moved from housing stages three to four and housing stages four to five was significantly greater in EH compared to DH systems (Table 3). All pigs in both systems were walked between these housing stages, with the exception of one DH system, in which pigs were moved by trailer from housing stage three to four.

**Table 3** Average distance moved (m, mean  $\pm$  SD) between housing stages.

	System		<i>P</i> (two-sample $t$ test)
	EH	DH	
Distance moved (m) stages three to four	64.1 $\pm$ 24.1	22.3 $\pm$ 14.0	**
Distance moved (m) stages four to five	73.4 $\pm$ 17.2	22.7 $\pm$ 8.5	*

\* $P < 0.01$ ; \*\* $P < 0.001$

In some systems, pigs were weighed either once or twice per housing stage, usually when entering or leaving a stage or both. There was no significant difference between the

percentage of EH and DH systems in which pigs were weighed once per stage (overall mean = 23%  $\pm$  7% (SD)) but in more DH systems (mean of 43%  $\pm$  19% (SD)), compared to EH systems (mean of 17%  $\pm$  13% (SD),  $P < 0.05$ , two-sample  $t$  test) pigs were weighed twice.

#### **Loading conditions**

Information on loading was provided by a total of 23 EH and 19 DH systems. More EH systems had on-farm loading ramps (65% compared to 40% of DH systems). Use of a loading ramp means that pigs are moved from a sloping surface to the lorry's tail gate, rather than from ground level. This more gradual change in gradient may encourage pigs to move more readily into the lorry. At loading moving from daylight to daylight occurred in more than twice as many EH systems compared to DH systems, accounting for two-thirds of all EH systems providing this information. This probably reflects the greater access of pigs in EH systems to daylight in their accommodation.

#### **Conclusions and animal welfare implications**

A number of differences in the rearing, finishing and loading environments of EH and DH pigs were observed which appeared to affect the ease with which pigs could be moved in lairage. During rearing and finishing, access to a less varied environment in terms of natural light and straw in the rearing phases, and walking shorter distances between later finishing stages appeared to be associated with pigs which were assessed as difficult to handle at lairage. Walking for longer distances will have provided a combination of exercise, experience of novelty and greater interaction with stockpeople, all of which could have had a bearing on the pigs' subsequent willingness to move. At loading, being moved from dim housing conditions to daylight, and from a level surface to a lorry's tail gate, both of which were more common in DH systems, may have resulted in pigs being more reluctant to move. During pre-slaughter transport and lairage, pigs encounter unfamiliar and potentially stressful conditions. The results of this survey suggest that it could be possible to manipulate the rearing, finishing and loading environment so that pigs do not react adversely to novelty, and move more readily during pre-slaughter handling. Pigs which are easy to move are less likely to be subject to harsh handling during transport and lairage, and pig welfare could therefore be improved during the final phase of the pigs' life.

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