The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK

Animal Welfare 2007, 16: 209-211
ISSN 0962-7286

Preliminary assessment of finishing pig welfare using animal-based measurements

HR Whay*†, C Leeb‡, DCJ Main†, LE Green§ and AJF Webster†

† University of Bristol, Department of Clinical Veterinary Science, Langford, Bristol, UK
‡ University of Veterinary Medicine Vienna, Austria
§ University of Warwick, Department of Biological Sciences, Coventry, UK
* Contact for correspondence and requests for reprints: Bec.Whay@bristol.ac.uk

Abstract

A preliminary investigation was undertaken to evaluate a series of animal-based welfare measures for the assessment of finishing pigs in units that were members of the RSPCA Freedom Food farm assurance scheme. A total of 20 finishing pig units were visited in the summer of 2002 and 14 of these were revisited in late winter 2003. Behavioural observations of the pigs, both undisturbed and disturbed by the observer, were made in 128 pens containing 9,444 pigs and the physical condition of 650 individuals was examined. A range of event behaviours were observed including social interactions. Play behaviour was observed in 66% of pens during ten-minute observation periods. The prevalence of physical conditions varied greatly between units. The most prevalent skin lesion was on the flank (40.8%) however, only 4.5% of pigs had both fresh and healed flank lesions suggestive of persistent fighting.

Keywords: *animal welfare, behavioural observations, farm assurance, finishing pigs, injuries, welfare assessment*

Introduction

Farm assurance schemes are designed to provide assurance to consumers on minimum production and legal standards or, as with the Freedom Food scheme, to improve the welfare of farm animals. The critical conclusion of a study examining dairy cattle was that membership of a farm assurance scheme may not guarantee a high performance for some welfare parameters (Main *et al* 2003). As a consequence of this finding, the Royal Society for the Prevention of Cruelty to Animals (RSPCA) funded this study to examine the potential for using animal-based assessment protocols to evaluate the impact of their resource-based Freedom Food standards (RSPCA 2002) on the welfare of finishing pigs.

Materials and methods

Twenty commercial finishing pig units were visited during the study. These units were nominated to be assessed by their producer groups. Freedom Food Ltd certified all farms as compliant with RSPCA Welfare Standards for pigs (RSPCA 2002). All 20 units were visited in the summer (July and August 2002). Fourteen of these farms were subsequently revisited during the late winter period (March 2003). Each visit lasted between two and three hours and was carried out by two observers who assessed separate pens on each unit. The mean number of pigs per unit was 1043 (range 300–2500) and the mean estimated weight of the pigs was 69 (± 24) kg. All except three of the units were for finishing only and all but two sourced their pigs from outdoor breeding units. All pigs had access to straw and were housed in covered pens. All pigs were fed either a pelleted or meal diet and all but three of the units operated an *ad libitum* feeding system. Group sizes ranged from five to 500 pigs in a pen.

The animal-based parameters used to assess the welfare of the finishing pigs were based on a consultation of welfare experts (Whay *et al* 2003). The suggested parameters were formulated into a draft protocol and pilot tested to maximise inter-observer repeatability.

As the observer approached a pen, five animals within a metre of the nearest edge of the pen were visually identified and the following observations were recorded; proportion of pigs that retreated as the observer reached the edge of the pen, time taken for the first pig to return to within a metre of the observer and the height and type of barrier between the observer and the pigs.

Once the pigs were acclimatised to the presence of the observer, the entire group were observed for ten minutes. All 'event behaviours' (Table 1) excluding oral behaviours, were observed and each time a new individual participated it was counted as a new event. Oral behaviours performed by 20 per cent of active pigs in the group (or a minimum of five animals) were then identified by a single scan sample. After completion of these observations a novel object (fresh block of pine wood, approximately 15 × 11 × 11 cm) was thrown into the pen and the time taken for the first pig to touch this object recorded.

Five individual pigs in each pen, selected on the basis of making observations of every fifth pig were then observed

https://doi.org/10.1017/S0962728600031353 Published online by Cambridge University Press

Table 1 Event behaviours observed over a ten minute period in 126 pens containing a total of 9,444 pigs.

Category of behaviour (proportion of pens showing each category of behaviour)	Specific behaviour	Number of specific behaviours recorded
Negative social interactions (94.5%)	Fighting	308
	Butting	514
Pushing (87.5%)	Pushing away from resources	305
	Pushing past other pigs	222
Abnormal respiration (81.3%)	Coughing	190
	Sneezing	356
	Dyspnoea	20
Pig interactions (82.8%)	Licking/biting flank	87
	Head to head	114
	Body manipulation	171
	Belly massage	88
Sexual behaviour (67.2%)	Sexual behaviour	489
Play (65.6%)	'Running games' playing	382
	Playing with water	17
	Playing with tyre	7
	Playing with chain	23
	Playing with string/sack	10
	Playing with straw	54
Biting (65.6%)	Vulva biting	25
	Tail biting/taking tail in mouth	104
	Ear biting	84
Scratching (46.9%)	Scratching	145
Heat-related (32%)	Bathing/wallowing	138
	Panting	45
Huddling (5.5%)	Huddling	72

from a position outside the pen. Each pig was observed for general signs of health and the left side of each pig was assessed for the presence or absence of skin and limb lesions. The presence of both fresh and healed lesions on the same pig was recorded as an indication of the prevalence of conditions that were more persistent over time. Lameness was defined as those pigs seen moving in the pen with an obvious limp.

These data were summarised using non-parametric statistics and expressed as either an actual count or a proportion of the total number of pigs observed. Possible interactions between measures at a pen level were examined using Spearman's rank correlation.

Results

Assessments were made in 128 pens with detailed assessments of 650 individuals and group observations of 9,444 pigs. Of the five pigs assessed as the observer approached the pen; no pigs retreated in 42 pens and all pigs retreated in 51 pens. The time taken for the first pig to return ranged from 0 to 79 seconds (mean 13.4). Time taken to return was significantly longer in pens that prevented the pigs seeing the observer approach ($P = 0.006$) and was significantly correlated with the proportion that retreated from the observer ($r = 0.788$, $P < 0.001$). The time to touch the novel object, observed in 74 pens, ranged from 0 to 233 seconds.

Event behaviours observed during a ten minute period are displayed in Table 1. The most frequently observed behaviour was butting (514 incidents) although playing was observed 493 times. As group size increased the proportion of pigs observed to be engaged in pushing between pigs or objects ($r = -0.60$), negative social interactions ($r = -0.48$), other pig to pig interactions ($r = -0.46$), biting ($r = -0.45$) and abnormal respiration ($r = -0.38$) decreased significantly ($P < 0.001$). There was, however, no significant decrease in sexual, play or heat-related behaviours.

Oral behaviours, observed in 20 per cent of each group, were assessed by a single scan sample. 484 pigs (28%) were manipulating an object; 460 pigs were manipulating straw and 11 were manipulating either toys or chains (not present in all pens). 236 pigs (14%) were manipulating other pigs, of which 19 incidents were aggressive. 389 pigs were eating and drinking, 28 were mouthing and 249 were manipulating other resources in the pen such as feeders, gates and faecal material. Tail biting was only observed on five occasions.

The range of physical conditions observed in 650 individuals is displayed in Table 2 which also illustrates that the levels of these conditions varied greatly between herds. Seven per cent of pigs had no detectable condition (excluding soiling and tear staining), 65% had between 1 and 3 types of lesion and 28% had between 4 and 7 types of lesion. Most lesions were consistent with pig-induced trauma (ie fighting or biting). Relatively few pigs had both fresh and healed skin lesions, those most frequently seen were on the flank (4.5%) and head or neck (3.5%). Correlation coefficients exceeding an r value of 0.3 were found between limb lesions and lameness ($r = 0.436$, $P < 0.001$); between oral behaviour (manipulating other pigs) and ear lesions ($r = 0.323$, $P < 0.001$) and between head or neck lesions and both ear and flank lesions ($r = 0.345$ and 0.340, respectively, both $P < 0.001$).

Discussion

This study produced preliminary data on animal-based outcome measures for use on finishing pig units in the UK. These data should not be seen as being representative of all pig units. The units were compliant with RSPCA welfare standards, most pigs had been reared outdoors and all pigs had access to straw. The prevalence of the welfare outcomes observed in this study is, however, mostly similar to those reported in other studies. Organic finishing pigs in Austria had a mean prevalence of 6% tear staining and 3% tail lesions (Gruber 2002). However, some parameters are lower than in other studies. For example the prevalence of bursal

https://doi.org/10.1017/S0962728600031353 Published online by Cambridge University Press

Table 2 Total number, prevalence and range of conditions observed in 650 finishing pigs during 34 visits.

Condition affecting pigs	Total number pigs affected	Proportion affected of total observed	Range of proportion affected across farms
Flank lesions	265	40.8%	0-60%
Head or neck lesions	219	33.7%	0-15%
Hindquarter lesions	74	11.4%	0-50%
Tail lesions	57	8.8%	0-20%
Ear lesions	162	24.9%	5-90%
Genital lesions	24	4.8%	0-35%
Limb lesions	307	47.2%	0-60%
Lame	189	29.1%	0-70%
Soiling	348	53.55	0-40%
Tear staining	404	62.2%	0-30%
Skin abnormalities	33	5.1%	0-40%

lesions in south west England is 63% in growing and finishing pigs (Moutottou *et al* 1999), which is higher than the 30% prevalence in this study.

The prevalence of injuries varied between units. As illustrated in Table 2, the prevalence of limb lesions ranged from 0 to 60% across units and ear lesions ranged from 0 to 90%. The assessment of skin lesions from outside the pen was relatively straightforward, however sampling was skewed towards individuals that presented themselves close to the observer and in very large groups a sample of five is unlikely to be representative of the herd. Lameness ranged from 0 to 70% between units with an overall prevalence of 29%. This is probably an underestimate as during these observations not all pigs were necessarily encouraged to move.

Whilst the provision of the resources defined in the RSPCA standard might bring about welfare benefits, this study highlights that fully certified units can have welfare problems. It is encouraging to note the relatively high prevalence of pens that showed play behaviour (66%). Pigs are unlikely to play if they are in significant pain or social distress. Mouttotou and Green (1999) observed that piglets spend less time playing if they have potentially painful limb lesions.

Conclusions

Animal-based outcome measures were feasible on the basis that the observers were able to visit three units per day. However, it is important to note that herd size may have influenced the results, although this effect was not consistent as behaviours such as play did not occur less frequently in larger groups. Despite the measures used in this assessment being identified by a panel of experts, the validity of some measures is still unclear. In order to make the assessment protocol feasible it is likely that the prevalence of certain conditions such as skin lesions and lameness have been underestimated. This type of compromise reflects the difficulties faced by farm assurance schemes aiming to employ animal-based measures within their assessment. This study is preliminary and further work is required to continue the process of developing feasible, valid and reliable measures of welfare in finishing pigs.

Acknowledgements

This study was funded by the Royal Society for the Prevention of Cruelty to Animals. The authors would like to thank all those farmers who kindly agreed to participate in the study.

References

Gruber T 2002 *Housing, feeding, hygienic conditions, health and management of finishing pigs in organic farming units.* PhD Thesis, University of Veterinary Medicine Vienna, Austria

Main DCJ, Whay HR, Green LE and Webster JF 2003 Effect of the RSPCA Freedom Food scheme on dairy cattle welfare. *Veterinary Record 153:* 227-231

Mouttotou N and Green LE 1999 Incidence of foot and skin lesions in nursing piglets and their association with behavioural activities. *Veterinary Record 145:* 160-165

Mouttotou N, Hatchell F, and Green LE 1999 Prevalence and risk factors associated with adventitious bursitis in live growing and finishing pigs in south west England. *Preventive Veterinary Medicine 39:* 39-52

RSPCA 2002 *RSPCA welfare standards for pigs.* RSPCA: Horsham, UK

Whay HR, Main DCJ, Green LE and Webster AJF 2003 Animal-based measures for the assessment of welfare state of dairy cattle, pigs and laying hens: consensus of expert opinion. *Animal Welfare 12:* 205-217

https://doi.org/10.1017/S0962728600031353 Published online by Cambridge University Press