Inter-observer reliability for Quality Behavioural Assessment in growing pigs

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Introduction

More recently, growing consumer demand both for quality food products and more ethical food production has meant that farm animal welfare is emerging as an area of potential added value for producers, retailers and other food chain actors. Under the influence of economics and increased yield per animal, pig welfare and behaviour were neglected. Pig farming became more intensive and controlled which resulted in rearing animals under confinement. All these demands dramatically increase the efforts to develop methods for assessing animal welfare and behaviour at farm level. As result, Welfare Quality® (WQ) protocols were developed by the researchers, culminating in the protocols developed by the European Welfare Quality program (Welfare Quality®, 2009). For pigs, protocols exist for growing pigs and for sows in all production stages, including suckling piglets. One method which may be suitable as a screening tool for identifying farms with compromised welfare before applying the full WQ protocol is Qualitative Behavior Assessment (QBA) which relies on a human observer's ability to integrate perceived details of an animal's demeanor and its context, using 'whole animal' descriptors such as active, fearful, calm, playful, content, indifferent or happy, etc. Based on these premises, many authors (Boissy et al., 2007; Wemelsfelder and Millard, 2009) have argued that QBA could potentially function as an integrative welfare assessment tool, complementing existing tools that focus on specific aspects of behavior and welfare. The main objective of this research was the inter-observer reliability for practical assessment of QBA protocol.

Materials and Methods

The QBA protocol was assessed on growing pigs kept under intensive conditions in two farms. The both commercial pig farms have integrated indoor production system. The growing pigs were reared in pens with concrete floor on straw and have enrichment materials in the pens. The number of animals per pen was differing related to pig's weight, ranging from 7 to 30 or 40 pigs. The pigs were fed *ad libitum* via a dry or wet-feed hopper. Every pen has two or more drinking nipples. The QBA protocol was carried out for a total of 20 min, during which time there was allowed to freely move around on the feeding table and choose as many observation points as felt for necessary, as long as reached both ends of the feeding table and as long as the observation time and points were equally distributed across the feeding table. The assessment and scan samples were taken regarding the WQ protocol for growing and finishing pigs (Welfare Quality®, 2009). There were selected between 4 and 6 observation points covering different areas of the farm. After the animals were returned to undisturbed behaviour there were observed the expressive quality of their activity at group level. It is likely that the animals will initially be disturbed, but their response to this can be included in the assessment. Total observation time was around 20 minutes and approximately 3 to 5 minutes per point of observation. After the observation finish, the scoring of the 20 descriptors was done using continuous visual analogue scale (VAS) defined by its left 'minimum' and right 'maximum' point. Scoring each term was done by drawing a line across the 125 mm VAS scale at the appropriate point. The classification was done on farm level and only one integrative assessment was made per farm. Calculation of the index for positive emotional state assessment was done according the instructions given in the protocol for welfare assessment of pigs (Welfare Quality®, 2009). The inter-observer variability between farms during assessment of QBA in growing pigs was calculated using Spearman's rang correlation.

Results

The on farm assessment of QBA for growing pig's resulting in data that comparatively are shown in Table 1. This data represent the inter observer practical assessment of QBA protocol.

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APPENDIX 1

Table 1. Comparative data from on-farm QBA for growing pigs and score calculation

Measurements	Farm 1		Farm 2	
	Observation 1	Observation 2	Observation 1	Observation 2
Active	0,39296	0,71224	0,46664	0,09824
Relaxed	0,97830	0,90221	0,57611	0,96743
Fearful	0,00950	0,00950	0,03325	0,00000
Agitated	-0,01422	-0,49059	-0,10665	0,00000
Calm	1,02102	0,95370	0,94248	0,74052
Content	0,99456	0,66304	0,72224	0,31968
Tense	-0,00971	-0,07768	-0,13594	0,00000
Enjoying	0,96820	0,85490	0,24720	0,14420
Frustrated	0,01496	0,08976	0,07480	0,00000
Sociable	-0,15990	-0,33210	-0,33210	-0,67650
Bored	0,03704	0,29632	0,15742	0,03704
Playful	0,90668	0,65615	0,50106	0,27439
Positively occupied	-0,11584	-0,28960	-0,05792	-0,52128
Listless	0,11022	0,87174	0,23046	0,08016
Lively	-0,10458	-0,19422	-0,61254	-0,55278
Indifferent	-0,13245	-0,08830	-0,12362	-0,02649
Irritable	-0,22667	-0,46527	-0,42948	-0,82317
Aimless	0,70387	1,10949	0,40562	0,13123
Happy	-0,00700	-0,00700	-0,06825	-0,00525
Distressed	0,37536	0,52224	0,38080	0,21216
Index	**1,20470**	**1,15893**	**-1,66602**	**-4,13802**
Score	**63,24859**	**62,77471**	**13,19067**	**19,97619**

Estimated scores for QBA showed higher values in Farm 1 than in Farm 2. The inter-observer reliability was high and there was high positive statistical significant correlation between observer 1 and observer 2 during assessment of QBA in growing pigs (Table 2).

Table 2. Spearman's coefficient of correlation for inter-observer reliability for QBA on farm assessment

Spearman's	Farm 1 x Observation 2	Farm 2 x Observation 1	Farm 2 x Observation 2
Farm 1 x Observation 1	0,930**	0,723**	0,737**
Farm 1 x Observation 2	1	0,665**	0,655**
Farm 2 x Observation 1		1	0,957**

**significant at the p<0.01 level

Discussion and Conclusions

The QBA appear to be useful to distinguish between farms in which animals appeared to be in a more positive mood from farms in which animals showed a negative mood. The QBA by itself does not bear direct relevance to welfare, but it contributes to a meaningful transition between descriptive terms of positive and negative mood, demonstrating that the QBA appears to be a useful methodology to distinguish farms on the basis of expression of natural behaviour. Using QBA is not very time consuming and inter-observer reliability showed high positive correlation.

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