



Assessment of animal welfare through behavioural parameters in Iberian pigs in intensive and extensive conditions

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ABSTRACT

Behaviour is a significant component of well-being and should be properly considered in a pig welfare assessment. However, interpretation of variations in behaviour is usually not straightforward, especially when dealing with animals housed and managed in a variety of systems. The fourth principle of the Welfare Quality® project, labelled “Appropriate behaviour”, was assessed on 21 farms (11 extensive and 10 intensive) with a total of 25,856 Iberian pigs (*Sus scrofa*). The methodology included scan samplings of social and exploratory behaviour, human–animal relationship tests and qualitative behaviour assessments (QBA). Changes in occurrence of behaviour and qualitative measures were evaluated and discussed when comparing Iberian pigs either in intensive or extensive rearing conditions. Negative as well as positive social behaviours were significantly ($P < 0.001$) more frequent among intensive Iberian pigs compared to extensive animals. In intensive Iberian pigs, both types of social behaviours were highly correlated ($r_s = +0.62$). No significant differences were observed in the occurrence of exploratory behaviour and in the proportion of animals exhibiting a panic response to the presence of humans between intensive and extensive Iberian pigs. It is suggested that the high occurrences of social negative behaviours recorded in intensive conditions are clearly an indicator of poor welfare; but that interpretations of variations in “positive” social and explorative behaviour are not straightforward and may lead to misinterpretations. Despite its subjectivity, the qualitative behaviour assessment appears useful to discriminate farms.

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1. Introduction

It is generally accepted that animal welfare comprises physical and mental health (Dawkins, 2004; Webster et al., 2004) and that it includes several aspects such as absence of thirst, hunger, discomfort, disease, pain and injuries, stress and the expression of normal behaviour (Farm Animal Welfare Council, 1992). Based on this multidimensional concept of welfare, the Welfare Quality® project aimed to

develop standardised on-farm assessment systems which provide reliable information on the way animals are produced. To that effect a multicriteria approach was built on four main principles of animal welfare: good feeding, good housing, good health and appropriate behaviour. Each of these four principles included several independent but complementary criteria, with a total of 12 criteria (Botreau et al., 2007). A set of predominantly animal-based measures was used to assess each one of these criteria after estimation of their validity and repeatability in pilot studies.

The fourth principle, labelled “Appropriate Behaviour”, deals with the evaluation of behaviours and includes the assessment of the expression of social and other behaviours (such as exploratory behaviour in pigs), good human–animal relationship and the presence of a posi-

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tive emotional state. Behaviour is a component of animal welfare and occurs as a consequence of the animal's motivational state and therefore the quantification of behaviour patterns is in fact a measure of motivation (Dellmeier, 1989). Expression of social and other behaviour as well as good human–animal relationship refer to variations in frequency of behaviours whereas the presence of a positive emotional state is based on a qualitative assessment. The qualitative assessment of animal behaviour relies on the ability of observers to integrate perceived details of behaviour, posture, and context into descriptions of animal's style of behaving using descriptors such as “relaxed”, “tense”, “frustrated” and “content” (Wemelsfelder, 2007). Even though a qualitative assessment may open the door to an anthropomorphic projection, recent studies have reported its scientific and biological validity (Rousing and Wemelsfelder, 2006; Wemelsfelder, 2008; Wemelsfelder et al., 2001).

Changes in behavioural patterns often represent the first level of response of an animal to an aversive or stressful environment. Then, behaviours which differ in pattern, frequency or context from those which are shown by most members of the species in conditions that allow a full range of behaviours are usually considered “abnormal” behaviours (Fraser and Broom, 1990). Many animal welfare studies seek to compare how animals behave in various housing environments or rearing conditions. More concretely, the comparison of behaviour of intensively and extensively kept animals has been used to determine how confined environment affects the development of behaviour. For instance, Krohn (1994) compared grooming, exploration and abnormal behaviour of dairy cows kept in loose housing and tie stall; Kerr and Wood-Gush (1987) observed changes in frequencies and sequences of behaviour of intensively and extensively reared calves and proportions of beak-related behaviours were studied in intensive and free ranging hens (Shimmura et al., 2008). Nonetheless, interpretation of variations in behaviour is usually not straightforward and originate many discussions on what should be considered as normal or not or even prejudicial or not for the animal, especially when dealing with animals housed in a variety of systems (Rushen and de Passillé, 2009).

Derived from the previous concern, this study focuses on the evaluation of “Appropriate behaviour” in Iberian pigs. Iberian pig farming system was the one of election for its wide diversity (Aparicio Tovar and Vargas Giraldo, 2006). Some medium-sized farms (around 500 animals per farm) follow a traditional system in which Iberian pigs meet most of their food requirements grazing on pastureland during a long growing period (fattened animals are over 24-month-old). Depending on the availability of resources, especially of acorns, Iberian pigs may receive a food supplementation. This last rearing system is generally considered as extensive. More recently, farming methods tend to reduce the production cycle and use systematically fodder leading to an intensification of the rearing system. As a result, intensive Iberian pig rearing ranges from conventional farms with fully slatted floor to farms with outdoor access. Besides this diversity in production systems, the Iberian pig is a rustic breed highly adapted to

Table 1

Recorded behavioural measures for the welfare assessment system of growing pigs on intensive and extensive Iberian pig farms (Welfare Quality®, 2009).

	Welfare criteria	Measures
Appropriate behaviour	Expression of social behaviours	Social behaviour
	Expression of other behaviours	Exploratory behaviour
	Good human–animal relationship	Fear of humans
	Positive emotional state	Qualitative behaviour assessment

an extensive rearing system. Its adaptation to more recent intensive rearing systems may, thus, rises new welfare implications inherent to the Iberian breed.

To sum up, this study does not pretend to have an extensive approach of the Iberian pig behaviour but to evaluate the changes in occurrence of behaviour and qualitative measures from the “Appropriate Behaviour” principle of the Welfare Quality® scheme when assessing Iberian pigs in intensive and extensive rearing systems. It will give causes for discussing the validity of these different measures across Iberian pig rearing systems. Finally, it will provide a first sight on the Iberian pig welfare applying the Welfare Quality® protocols in extensive and intensive production systems.

2. Materials and methods

2.1. Welfare assessment system

The Welfare Quality® assessment system consisted of four main principles of animal welfare: good feeding, good housing, good health and appropriate behaviour. Each of these four principles included 12 independent criteria (Botreau et al., 2007). This study focuses on the different animal-based measures from the “Appropriate Behaviour” principle evaluated on Iberian pigs in intensive and extensive conditions (Table 1).

2.2. Animals and farming systems

Iberian pigs from 11 extensive and 10 intensive farm units were evaluated on the basis of the “Appropriate Behaviour” principle.

Extensive Iberian pigs were kept in outdoor paddocks whose size varied from 2000 m² to 400 ha. All paddocks provided covered facilities as well as wallows, puddles or small temporal streams to allow the animals to cool themselves. Pigs were grazed on pasture lands eating acorns and other resources (grass, bushes, roots, tubers, etc.), although during the assessment period (April–May) a supplement of concentrated fodder was provided manually once or twice a day. The average group size was 185 pigs per paddock and the average space allowance per pig was 387 m² ± SD = 419.6 m². Pigs entered the paddocks at an average weight of 48 kg and left to be slaughtered at 150–160 kg. Extensive pigs assessed were meanly 280 day-old ranging from 42 to 420 day-old.

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