Development and testing of a novel instrument to measure health-related quality of life (HRQL) of farmed pigs and promote welfare enhancement (Part 2)

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Abstract

The development of a novel structured questionnaire instrument to measure health-related quality of life (HRQL) in individual farmed pigs was described previously (companion paper). The instrument embraces the measurement of positive welfare, and was developed with farmers and stockpersons, for use by them on-farm. This paper describes the development of a scoring methodology for the instrument and provides evidence for its construct validity. Field testing on four commercial farm units indicated that scores for health and affect correctly allocated 88.7% of pigs to known treatment groups and strongly predicted previously defined intervention levels. The tool was also used in an experimental study alongside other measures to identify the impact of early-life challenges (mixing of pregnant gilts and tail docking neonatal pigs) on subsequent pig welfare, and identified long-term changes in HRQL of prenatally stressed piglets, a finding supported by other measures. This work describes a novel approach to farm-level welfare assessment in which entirely animal-based HRQL measurement can provide a measure of welfare at the herd level while retaining information about individuals within the herd and about aspects of provision that can be targets of intervention to improve welfare, and promotes a move from welfare assurance to welfare enhancement.

Keywords: animal welfare, farmed pigs, health-related quality of life, measurement, validity, welfare enhancement

Introduction

As part of a research programme to investigate the welfare consequences for pigs of early-life adverse experiences, health-related quality of life (HRQL) was identified as an appropriate focus of integrative welfare measurement for farmed pigs, and one that would embrace the measurement of positive welfare. A novel structured questionnaire instrument was developed using a psychometric approach: evidence for content validity was presented and the instrument was found to have high utility when pre-tested on commercial farm units (Wiseman-Orr et al 2011). The instrument’s items consist of animal-based observations commonly made by experienced farmers and stockpersons, addressing provision of the Five Freedoms (FAWC 2010). The instrument also addresses the direct assessment of affect, including positive affect. The instrument comprises 128 items, 98 that can be related to the Five Freedoms and considered to be causal for HRQL (such as ‘coughing’, ‘tail bitten’ and ‘scouring’), and 30 variables that can be considered to be indicator variables for HRQL (such as ‘lively’, ‘curious’ and ‘frightened’), assessing affect.

The psychometric approach, which was adopted to develop the pig HRQL instrument (Wiseman-Orr et al 2011), requires that instruments demonstrate properties of validity and reliability before being adopted for measurement purposes, and offers a range of approaches to such evaluation. Criticism has been levelled at instruments developed with insufficient attention paid to such properties and to utility (Abu-Saad 2001; Eiser & Morse 2001). Validity, evidence that the instrument is able to measure the construct it was intended to measure, is the most fundamental attribute of a measurement instrument. Validation of any HRQL instrument is an iterative process, as new information is revealed for its use with new populations, in new contexts and for new purposes. In this process, instrument developers should seek evidence for validity of three kinds: content validity, criterion (or convergent or concurrent) validity, and construct validity (Fayers & Machin 2007; Streiner & Norman 2008).

Content validity, a measure of the extent to which an instrument’s items are relevant and adequate for its purpose, was ensured for the instrument described in this paper by the method of generation, selection and scaling of the instrument items and by the results of pre-testing the prototype instrument which are described elsewhere in this issue (Wiseman-Orr et al 2011). Evidence for criterion validity is