RESEARCH ABSTRACT

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Title:	Validation of scan sampling techniques for pain behaviors in castrated piglets – **NPB #19-065**
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Date Submitted:	9/30/2020

Scientific Abstract:

Scan sampling methodology

Surgical castration is a painful procedure that is routinely performed without pain relief on commercial pig (Sus scrofa domesticus) farms. Previous research has focused on quantifying piglet pain response through behaviours. However, to date, behavioural sampling methodologies used to quantify pain associated with castration have not been validated. Therefore, the objective of this study was to validate scan sampling methodologies (2-min, 3-min, 5-min, 10-min and 15-min intervals) to quantify piglet pain responses expressed by castrated piglets' behaviour. A total of 39 Yorkshire-Landrace × Duroc male piglets (five days of age) were surgically castrated using a scalpel blade. Behaviour frequency and duration (scratching, spasms, stiffness, tail wagging and trembling) of each piglet were continuously collected for the first 15 min of the following hours relative to castration (–24, 1–8 and 24). To determine if the sampling interval accurately reflected true duration and frequency for each behaviour, as determined by continuous observation, criteria previously utilised from other behavioural validation studies were used: coefficient of determination above 0.9, slope not statistically different from one and intercept not statistically different from zero. No scan sampling interval provided accurate estimates for any behavioural indicators of pain. The results of this study suggest that continuous sampling is the most appropriate methodology to fully capture behaviour specific to pain associated with castration. Using validated behavioural methodologies in future research can assist in the development of objective, science-based protocols for managing pig pain.

Time interval sampling methodology

Surgical castration is a painful procedure routinely performed on piglets. Behavioural deviations post-castration include decreased standing, nursing and walking, and increased trembling, scratching and tail wagging. However, no study has validated the accuracy of time sampling intervals (TS) in which behaviors are continuously scored at defined intervals compared to continuous recording (CR) on piglet castration pain. Therefore, the objective of this study was to validate the accuracy of six time sampling methods (5, 10, 15, 20, 30, and 45 min) to quantify piglet behaviour post-castration when compared to CR for 1-hour post-castration. Sixteen Yorkshire-Landrace x Duroc piglets were surgically castrated. Frequency and duration of maintenance and pain behaviours for each piglet were CR for one-hour post-castration. Subsequently, CR data was divided into data subsets for each defined interval and the true proportion and frequency for each behaviour was tested using a generalized linear mixed model and linear regression analysis (Coefficient of determination >0.9, slope

not different from 1 and intercept not different from 0). For the generalized linear mixed model, 30 and 45 min time sampling methods were not different when compared with CR for all behaviours. For the linear regression analysis, affiliative interaction, sitting, walking, huddled up, prostrated, scratching, spasms, and trembling behaviours met the pairwise comparison accuracy criteria at the 45 min time sampling. Results from this study indicate that a 45 min time sampling method may be the optimal time point to investigate piglet behaviour post-castration dependent upon the behaviour of interest and experimental design setup.This should be a scientific description limited to one page in length to describe your project and its results.