Early detection of boar taint by means of behavioural and physical predictors

Bekaert KM¹, Tuyttens FAM¹, Nijs G¹, Aluwé M¹, Millet S¹, Van Oeckel M¹, Vangeyte J¹, Baert J¹, Verheyden K², De Brabander HF², De Brabander DL¹
¹ILVO, Institute for Agricultural and Fisheries Research, Merelbeke, Belgium
²Ghent University, Faculty of Veterinary Medicine, Merelbeke, Belgium

Introduction

Surgical castration of male piglets in order to prevent boar taint is increasingly criticised on animal welfare grounds as it induces stress and pain and affects the health and the physical/behavioural integrity of the animal. Several more humane alternative methods to reduce boar taint are already being applied in some countries or are under development. One such alternative strategy that is being investigated in Belgium (and several other countries) is the breeding of entire males combined with the detection and sorting out of carcasses with boar taint at the slaughter line. Since entire male carcasses are economically less valuable it is important that the incidence of boar taint is reduced. This can be achieved to some degree by taking appropriate stockmanship and management actions, such as reduced slaughter weight, feed strategies (Jensen et al., 1995), or specific hygiene measures (Hansen et al., 1994). Furthermore, if the development of boar taint could be predicted at an early stage, preventive actions against these ‘high risk’ animals can be taken (e.g. slaughter at an earlier age, immunocastration, surgical castration using anaesthesia/analgesia).

The aim of this contribution is to present some preliminary results regarding the early detection of boar taint by means of behavioural (time spent sitting) and physical (testis size, skin lesions and hygiene status) predictors.

Materials and Methods

Two experiments were conducted in which entire males were raised. In Experiment 1 (physical predictors) and 2 (behavioural predictors) data were collected every fortnight from 9 weeks of age until slaughter (approximately 24 weeks).

Experiment 1: Physical predictors

Three pig breeds (Pietrain, Large White and Belgian Landrace Stress Negative) were divided into 12 pens of 6 entire males (4 pens per breed). The width and length of both testes of each boar were measured with a calliper every fortnight. At the same time, skin lesions and hygiene status of these boars were quantified on nine different regions of the body using a five point scale. The average of these scores were calculated for all nine regions, the front region and the back region in order to estimate the overall status of skin lesions and hygiene of each individual animal.

Experiment 2: Behavioural predictors

In this experiment 24-hour behavioural data were collected every fortnight on two pens of 8 boars (Pietrain x Hybrid). The data were analysed using Noldus Observer software. Here we report only on the passive behaviours scored during 20 minute intervals.

Association with boar taint

The correlation of these physical and behavioural parameters with boar taint was tested using Statistica 8. Boars from both experiments were tested for boar taint at slaughter by laboratory analyses of skatole and androstenone concentration in fat samples using cut-off values of 0.2 ppm and 0.5 ppm respectively. In addition, boars from the second experiment were also tested for boar taint using the soldering iron method, an expert panel and a consumer panel (Aluwé et al. 2008).

Results

Physical predictors

Androstenone levels could be quantified in only 3 of the 20 Pietrain boars which was insufficient for testing associations with physical predictors. Skatole concentrations were quantified in 17 of the 20 Pietrain boars but did not correlate significantly with any of the physical parameters. Androstenone
levels in Belgian Landrace Stress Negative boars were not significantly correlated with testis size or skin lesions, but their hygiene status at week 13 was positively correlated with skatole levels ($p<0.05$, $r=0.42$, n=23). Androstenone levels of Large Whites at slaughter were correlated with testis size (length, width and volume) at week 13 ($p<0.05$, n=15) and skin lesions (total) at week 17 ($p<0.05$, n=17). Skatole levels were correlated with hygiene status at week 21 ($p<0.05$, $r=0.69$, n=15) and 23 ($p<0.05$, $r=0.54$, n=15).

**Behavioural predictors**

Of the passive behaviour only the proportion of time spent sitting during week 11 was negatively correlated ($p<0.05$, n=8) with the following boar taint analyses: soldering iron method ($r=-0.71$), expert panel (fat in general ($r=-0.79$), meat flavour general ($r=-0.87$), meat odour ($r=-0.86$) and flavour ($r=-0.81$) for skatole and meat flavour androstenone ($r=-0.80$)). However, it was also positively correlated with skatole level ($p<0.05$, $r=0.70$, n=8). Time spent sitting was not associated with boar taint as assessed by the consumer panel.

**Discussion**

Using a limited number of entire males several potentially promising parameters for the detection of boar taint in live pigs at an early age could be identified. These include physical predictors such as testis size, skin lesions and hygiene status and behavioural predictors such as time spent sitting. These associations, however, appear to depend on breed, time of sampling and boar taint detection method. These preliminary results highlight the potential to predict which boars are likely to develop boar taint when they grow older, but further research is needed on the reliability of these predictions, on confounding and influencing factors, and on the identification of boar taint.

**Reference List**

