

Latest Research Results



Welfare friendly alternative to surgical castration for organic pigs

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Piglet castration is a common practice performed to avoid meat quality issues related to boar taint. Boar taint is the unpleasant smell produced by the meat of non-castrated pigs during cooking. Castration of piglets is a highly controversial practice, as the procedure is painful and has been traditionally performed without anesthesia. Most physical alterations are prohibited by the Canadian Organic Standards, but an exception still must be made for castration, until a more welfare friendly alternative is found.

Objectives:

The main goal of this research was to identify and validate genetic selection as a sustainable and welfare friendly alternative to surgical castration in pigs of various breeds used in organic production systems. The objectives were to demonstrate the effectiveness of genetic selection to control boar taint in boars, and to characterise the aggressive and social behaviour of low and high boar taint boars.

Materials and Methods:

This study took place at an Alliance Genetics Canada (AGC) finisher barn, and at the Arkell Swine Research Station. Boars born and kept intact between February and August 2022 were enrolled in the study, for a total of 119 boars. At the AGC barn, boars were pure-bred Duroc, Landrace or Yorkshire. At the Arkell Swine Research Station, the boars were a three-way cross between Landrace, Yorkshire, and Durocs.

Once the boars reached 110-120 kg, (160-180 days of age), they were evaluated for boar taint and ease of handling. At this time the boars were weighed, and after applying a topical, local anesthetic, two backfat samples per boar were collected using a biopsy gun. An ear sample was taken and boars were

individually marked with animal paint for visual identification. At the Arkell Swine Research Station, a blood sample was collected at this time as well. The ear samples were sent away for genotyping.

The day following sampling, live behavioural observations were performed, using a video camera as back up placed in front of each pen. The behavioural observations were performed for 20 minutes per hour, per pen, for a total of 40 minutes of observations per pen. Any instance of aggression (head to head knock, head to body knock, parallel pressing, inverse parallel pressing) or mounting behaviour, and which boars were involved was recorded.

The fat biopsies were analysed to measure the androstenone (a hormone that contributes to boar taint) in the fat. The physiological levels of androstenone were used to evaluate the level of boar taint, such that boars in the low group had an androstenone concentration less than 1 ug/g. Associations between the level of boar taint (androstenone) and the behavioural observations were then investigated. The plasma samples were analysed to determine the concentration of estrogen sulfate (E1S) which is a measure associated with sexual maturity.



Results:

Of the 119 sampled boars, 66 boars or 55.5% were low boar taint, or not tainted (average of 0.60 ug/g), and 53 boars or 44.5% were high boar taint or tainted (average of 2.43 ug/g), using the threshold for tainted of an androstenone concentration exceeding 1ug/g.

Using the lowest and highest 25% of the boars, high androstenone boars tended to require increased interventions when handled. Additionally, low androstenone boars were mounted significantly more often than high androstenone boars. Latency to exit for the open-door test, mounting, being aggressive, and receiving aggression were not found to differ between the high and low androstenone groups.

There were a total of 71 mounting bouts and 39 aggression bouts. The average frequency of mounting was 0.59 bouts/boar/40 min, with frequencies ranging from 0 to 7 bouts/40 min. The average frequency of aggression was 0.33 bouts/40 min, ranging from 0 to 9 bouts/boar/40 min.



Of the 71 mounting bouts, 53.5% were performed by a boar with high boar taint, and 46.5% were performed by a boar with low boar taint. Further, 43.7% of the boars being mounted had high boar taint, while 56.3% of the mounted boars had low boar taint. Low boar taint boars mounting other low boars occurred 23 times, while high boars mounting other high boars occurred 21 times. High boars mounted low boars 17 times, while low boars mounted high boars 10 times. Respectively, this presented 32.4%, 29.6%, 23.9% and 14.1% of the 71 mounting bouts.

Once the genotype results are known, associations between the genetic markers, androstenone and E1S levels and behaviour will be analyzed.

Conclusion:

In conclusion, this study found that low boar taint pigs tended to be easier to handle and were mounted more frequently by other boars. The frequency of aggression and mounting behaviour in the present study was overall low in both low and high boar taint animals. Further studies should examine whether these low levels of aggression and mounting could still result in physical injuries, and whether regrouping before slaughter, which is known to exacerbate aggression in pigs, would result in differences between low and high boar taint groups.

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