

## Early plasma androstenone concentrations may indicate extent of boar taint at slaughter

Jocelyn Cameron, BSc; Renée Bergeron, PhD., Jim Squires, PhD.  
Department of Animal Biosciences, University of Guelph

### Background

Almost all male piglets are castrated in the first few days after birth to remove the incidence of a meat quality issue called boar taint. Androstenone, a boar taint causing compound, is a steroid hormone produced during puberty in boars and is deposited in the fat. Androstenone is also produced during a spike of testicular steroidogenesis at 21 days of age.

**Rationale:** This early steroid peak is thought to mature the hypothalamic-pituitary-gonadal axis; however, 21-day steroid concentrations have not previously been linked to the extent of boar taint development at slaughter.

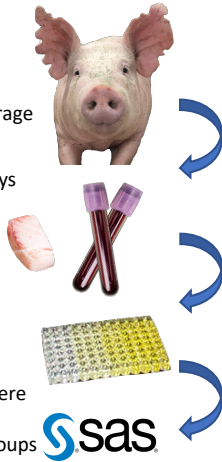
### Methods

Crossbred [(Yorkshire x Landrace) x Duroc] boars (n=36) were raised in pens of 4 (2 male, 2 female) to average market slaughter weight.

Blood samples were taken at 21 days and slaughter, and backfat was collected at slaughter.

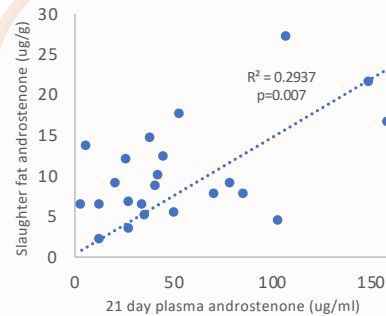
Plasma and fat androstenone concentrations were measured by androstenone-specific ELISA.

Data was analyzed using univariate regression analysis (assumptions were tested), Pearson correlation and ANOVA. Boars were analyzed in groups above and below average market slaughter weight (120kg).

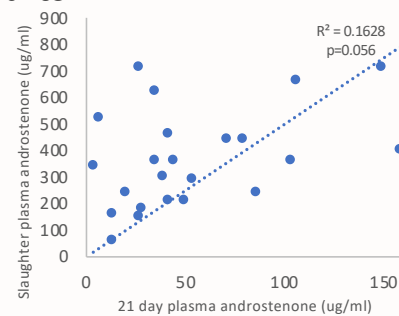


**Objective:** The objective of this research is to determine if androstenone concentrations at 21 days of age can predict boar taint development at slaughter

### Results

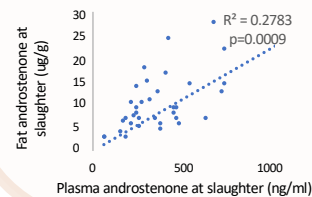


**Figure 1.** Boars >120kg at slaughter (n=23) show positive association ( $R^2=0.29$ ,  $p=.007$ ) between plasma androstenone at 21 days and fat androstenone concentration at slaughter.



**Figure 2.** Boars >120kg at slaughter (n=23) show trend of association ( $R^2=0.16$ ,  $p=.056$ ) between 21-day plasma androstenone and plasma androstenone concentrations at slaughter.

Boars yet to reach 120kg (average market slaughter weight) by slaughter (n=13) did not show association ( $R^2=0.04$ ,  $p=.5$ ) between 21-day plasma androstenone and fat androstenone concentrations at slaughter. Plasma and fat androstenone concentrations were not significantly different ( $p>.05$ ) between groups above and below 120kg at slaughter.



**Figure 3.** (left) Plasma and fat androstenone at slaughter are strongly correlated ( $R=0.53$ ;  $p=.0009$ ).

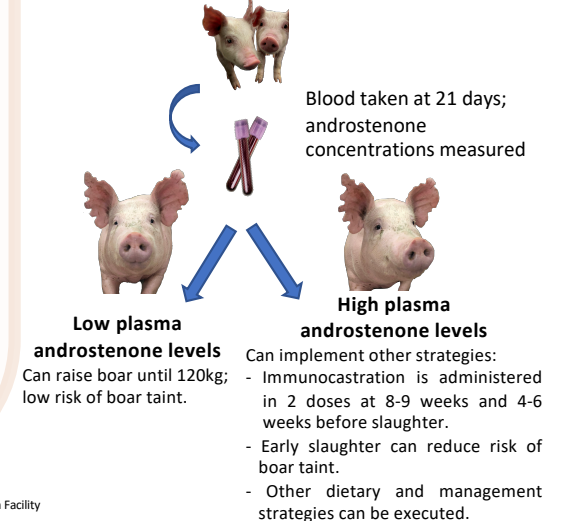
**Figure 4.** (right) Age and weight at slaughter are not associated ( $p>.05$ ).



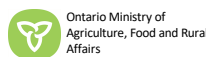
### Implications

These results suggest that 21-day plasma androstenone concentrations may be indicative of the extent of androstenone accumulation in the fat and plasma if pigs are over 120kg at slaughter. This can aid with identifying boars at risk of developing boar taint early so that solutions such as immunocastration can be implemented. Boars that have yet to reach 120kg by slaughter may not have reached full maturity, thus prediction of boar taint potential is less accurate. Further research should focus on identification of genetic markers for low and high potential boar taint producing pigs.

#### Theoretical lifetime of a boar:



Acknowledgements:



Arnell Swine Research Facility  
Ponsonby Research Station