Selection of assessors for boar taint evaluation: Effects of varying olfactory acuity to androstenone

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skatole
learning
prior experience
fat content
androstenone
rejection thresholds
sensitivity
OR7D4
indole
repeated exposure

Disagreement on the prevalence of boar taint

Disagreement on the prevalence of boar taint

30-60%  

3-9%  

Main objectives

1. to establish a trained panel
2. to characterise panelists’ olfactory acuity to androstenone
3. to perform sensory evaluation of low fat loin samples
4. to analyse the variance of sensory data w.r.t. olfactory acuity

Material and methods

- 16 panellists, 11 weeks of training
- triplicate triangle tests, ~150 ng and ~15 ng androstenone on paper smell strips
- Boar loins & standard (castrate, female)
- LOW, MED, HIGH in androstenone & skatole
- 3 replicates per assessor, 4 to 6 animals per category
- 8 g cubes, covered, cooked at 170°C for 8 minutes
- attributes: androstenone and skatole odour / flavour
Smell strips

- cardboard paper
- stock solutions in methanole
- various working solutions in propylene glycol
- 30 µl on the strip
- put in PP test tube, dry for ~ 24 hrs, cover
- coded label, use within 5 days
Trained panelists sensitivity w.r.t. odorant level

Correct discrimination of androstenone (3 triangles)

Meier-Dinkel et al., 2013. Meat Science 94, 19–26

Learning to smell with repeated exposure sensitivity w.r.t. odorant concentration (n=121)

\[
X^2 = 15.62 \\
3 \text{ df, } p = 0.0014
\]

\[
X^2 = 32.45 \\
3 \text{ df, } p < 0.0001
\]

\[
X^2 = 17.27 \\
3 \text{ df, } p = 0.006
\]

Effect of trained assessors’ sensitivity on androstenone flavour

0 = not perceivable, 100 = strongly perceivable

Intensity of androstenone flavour

SENS assessors, n = 7  HIGHSENS assessors, n = 9

Boar loins / standard loins

(skatole/androstenone level)
Effect of trained assessors’ sensitivity on androstenone flavour

0 = not perceivable, 100 = strongly perceivable

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Conclusions

- Assessors’ sensitivity affects perceived androstenone intensity
- HIGHSENS assessors discriminated boar loins >1.5 to 2.0 ppm backfat androstenone
- Smell strips for objective evaluation of olfactory acuity: cheap, little amount of odorant, ease of use
- Worst case scenarios /w HIGHSENS assessors
Contributions:

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Data analysis: Analysis of variance

\[ y_{ijkr} = \mu + p_i + s_j + p_i \times s_j + A_k + p_i \times A_k + e_{ijkr} \]

where

- \( y_{ijkr} \) is the intensity of the sensory attribute;
- \( \mu \) is the general mean;
- \( p_i \) is the fixed effect of product (meat type: 1 to 9);
- \( s_j \) is the fixed effect of androstenone sensitivity (SENS and SENSHIGH);
- \( p_i \times s_j \) is the meat type x sensitivity interaction effect;
- \( a_k \) is the random effect of assessor;
- \( p_i \times a_k \) is the random effect of the assessor x product interaction;
- \( e_{ijkr} \) is the residual error.

LSD-test with Bonferroni adjustment