Parallel analysis of boar taint compounds in meat and in backfat

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Background

The lipophilic characteristic of androstenone (A), and to a slightly lesser extent, skatole (S) and indole (I) facilitates the analysis of these compounds in adipose tissue, or, in the liquid fat and pure fat melted from it. Indeed, with an IMF ranging from 2 to 10 %, the expected concentrations of A, S and I in meat are well below the detection limits of most common analytical techniques. However, although the determination of boar taint compounds is generally performed in fat, consumers have mostly meat in their dishes. Therefore, it seems legitimate to ask the question of how good is the correlation of boar taint compounds concentration in fat versus in meat.

Materials & Methods

- Samples from 22 boars were used (170 days of age, 109±13 kg of liveweight):
  - Backfat, stored under vacuum at -20°C
  - Muscle (*Longissimus dorsi*, 10thrib), freeze-dried, stored as powder.
- HPLC analysis, internal standards: androstanone for A, 2-MID for S and I
  - Backfat: 2 replicates, analysis in liquid fat (microwave), extraction with MeOH
  - Muscle: 3 replicates, analysis in liquid fat after its extraction from meat with petrolether at 60°C (recovery rates: fat>96%, A=94% at 1.5 ppm); then, similar to the backfat procedure. Expressed in meat using IMF.

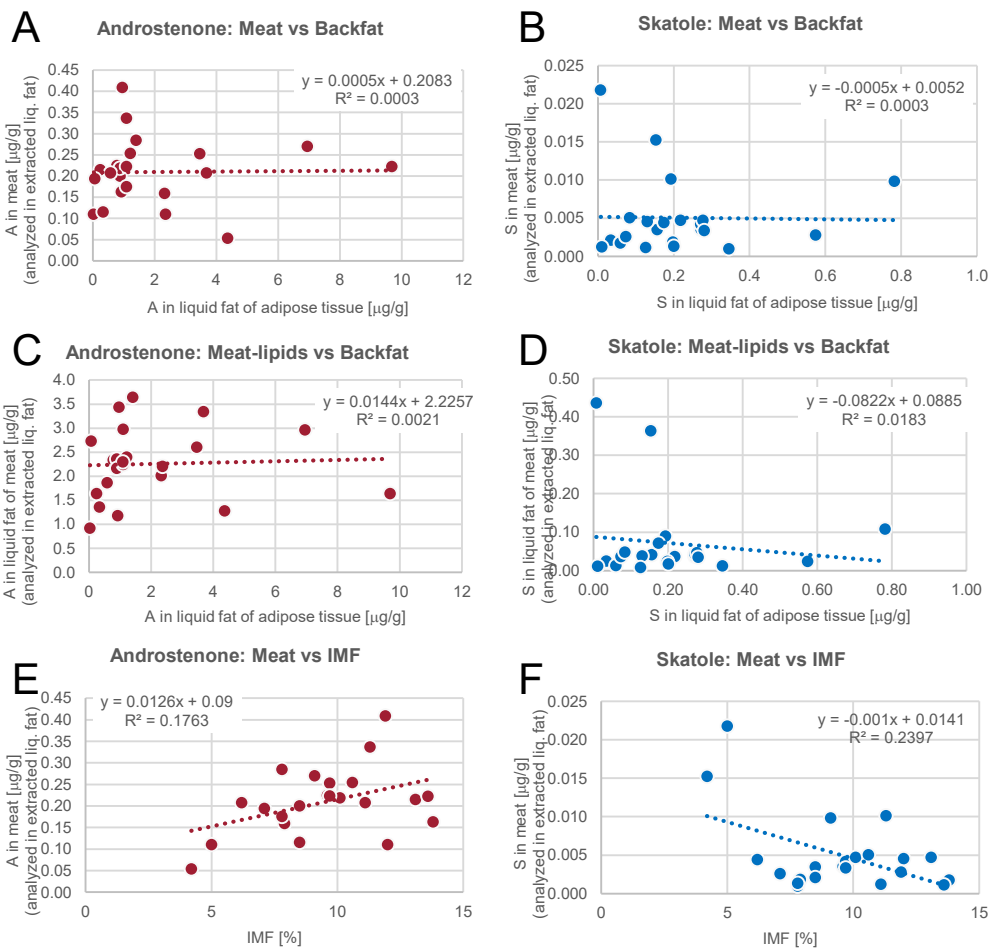
Calibrations

Different for meat & backfat:

Ranges :
- A: 0.4 – 4.6 µg/g liquid fat
- S, I: 0 - 2.2 µg/g liquid fat

R^2 :
- A >0.99 (>0.94 for meat)
- S, I ≥0.99

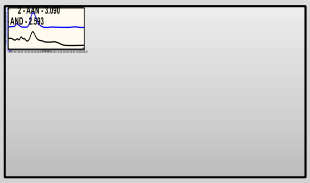
Results



Stability of boar compounds

Repetition of the analysis in backfat after 18 months of sample storage gives R^2 >0.92.

Repetition of the lipid extract from meat after 8 months of storage gives a different figure.



HPLC peaks: 1=androstenone, 2=androstanone.
Sample storage:
Blue, as lipid extract from meat;
Black, as meat.
Time before lipid extraction:
Blue < 1 months.
Black > 9 months.
Same sample. HPLC procedure at the same time)

Graphs A,B,C,D: By eliminating extreme points R^2 improves to 0.6-0.7 for S, but only to 0.3 for A.
Graph E: Androstenone seems to be slightly correlated to IMF

Conclusions

Although the analysis of boar taint compounds in adipose tissue is more convenient from an analytical point of view, the information thus obtained is probably not complete. These results show the need to directly analyze meat which is the main product actually consumed.