QUALITY CONTROL IN ENTIRE MALE PIG PRODUCTION WITH PARTICULAR EMPHASIS ON BOAR TAINT DETECTION *(WG4 IPEMA Cost Action)*

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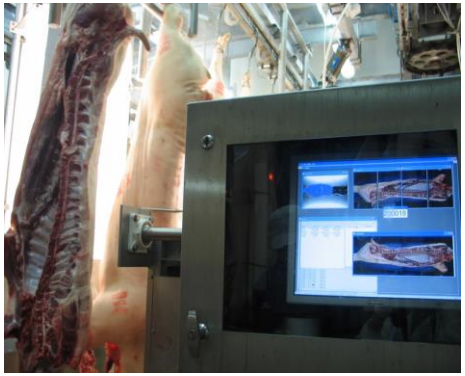
IPEMA- ***CA15215***

Innovative approaches in pork production with entire males

CARCASS CLASSIFICATION ON LINE



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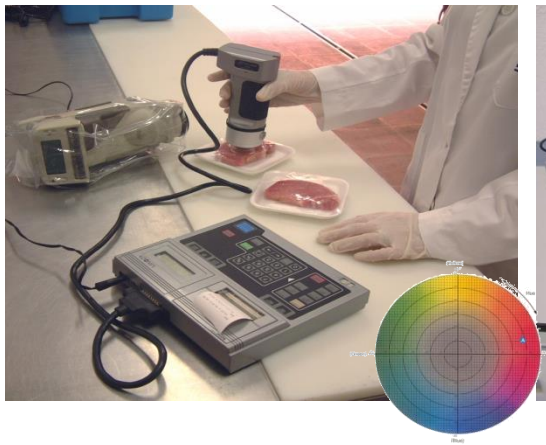
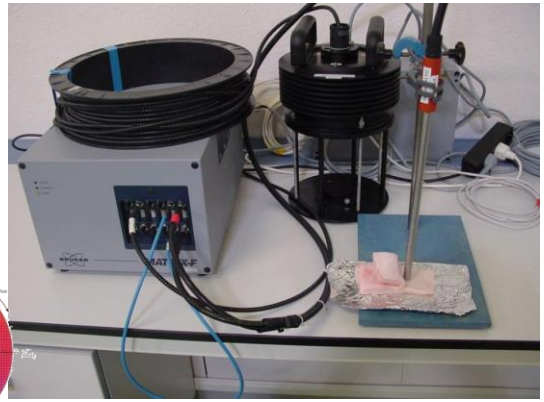
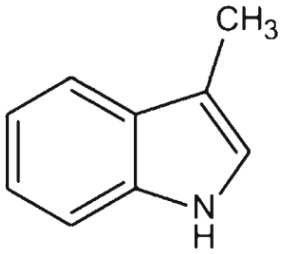
MEAT/FAT GRADING ON/AT LINE



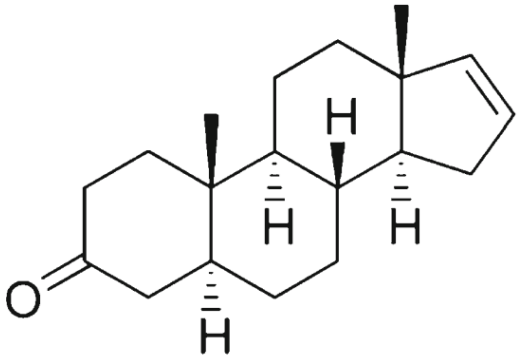


Switzerland

BOAR TAINT CONTROL ON/AT LINE - How



3-methyl-indole
(Skatole)



5α-androst-16-en-3-one
(Androstenone)

BOAR TAINT

(Jarmoluck, 1970; Mathur et al 2012; Trautmann et al 2016)

AT LINE

Colorimetric method

(Mortensen and Sørensen, 1984)

AT LINE
ON LINE

NL, DE, BE, DK, FR, ES

http://boars2018.com/pictures-and-movies/

No rapid technical method to be used on line to detect boar taint

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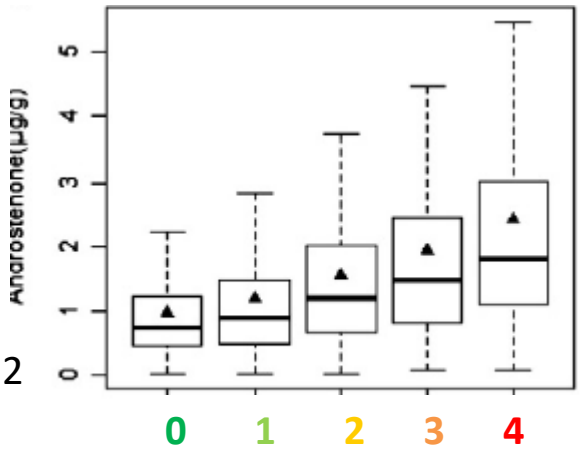
BOAR TAINT CONTROL ON/AT LINE - What

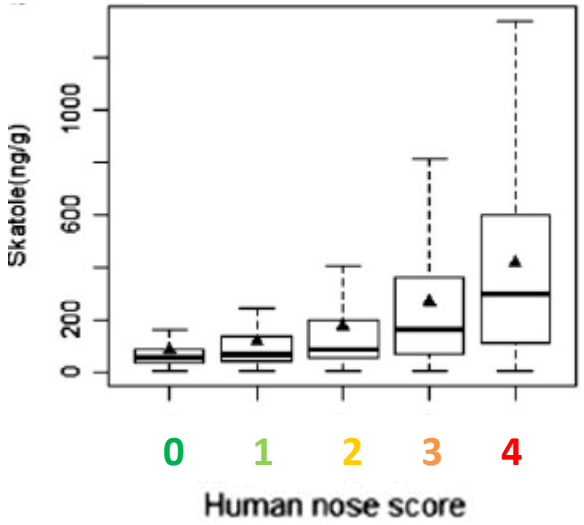
- **0 : no detectable boar taint,**
- **1 : no boar taint but some off odour,**
- **2 : more off odor but no boar taint,**
- **3 : some boar taint odour,**
- **4 : strong boar taint odour.**



Mathur et al 2012
N>5000

Corr: AND-HN average 0.42 [0.25, 0.55]

Corr: SKA-HN average 0.69 [0.32, 0.89]



	Hot iron
Chem_AND	**0.36**
Chem_SKA	**0.30**

(Aluwé et al., 2012)

Other compounds:

4-Phenyl-3-buten-2-one (Rius Solé & GarciaRegueiro, 2001)

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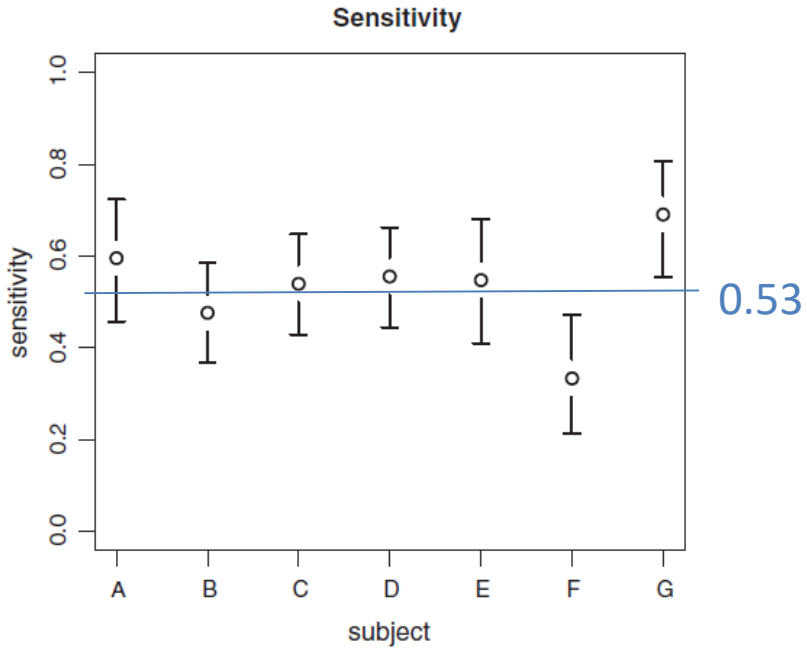
BOAR TAINT CONTROL ON/AT LINE - What

	Hot iron
Consumer_odour	0.13
Consumer cook	0.26

(Aluwé et al., 2012)

Low agreement hot iron/consumer



(Trautmann et al., 2014)

	AND_chem	SKA_chem
Consumer_odour	-0.49	-0.35
Consumer flavour	-0.42	-0.26

(Font i Furnols et al., 2009)

Low agreement chemical/consumer

Calculation of risk of dislike

(Aluwé et al., 2018; Christensen et al., 2019)

Cut-off levels to guarantee consumer acceptance are not defined and depend on a lot of parameters

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BOAR TAINT CONTROL ON/AT LINE – Where

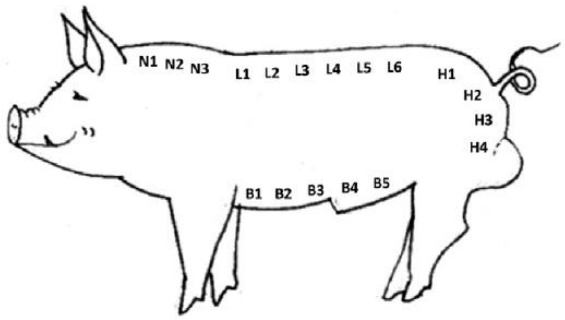
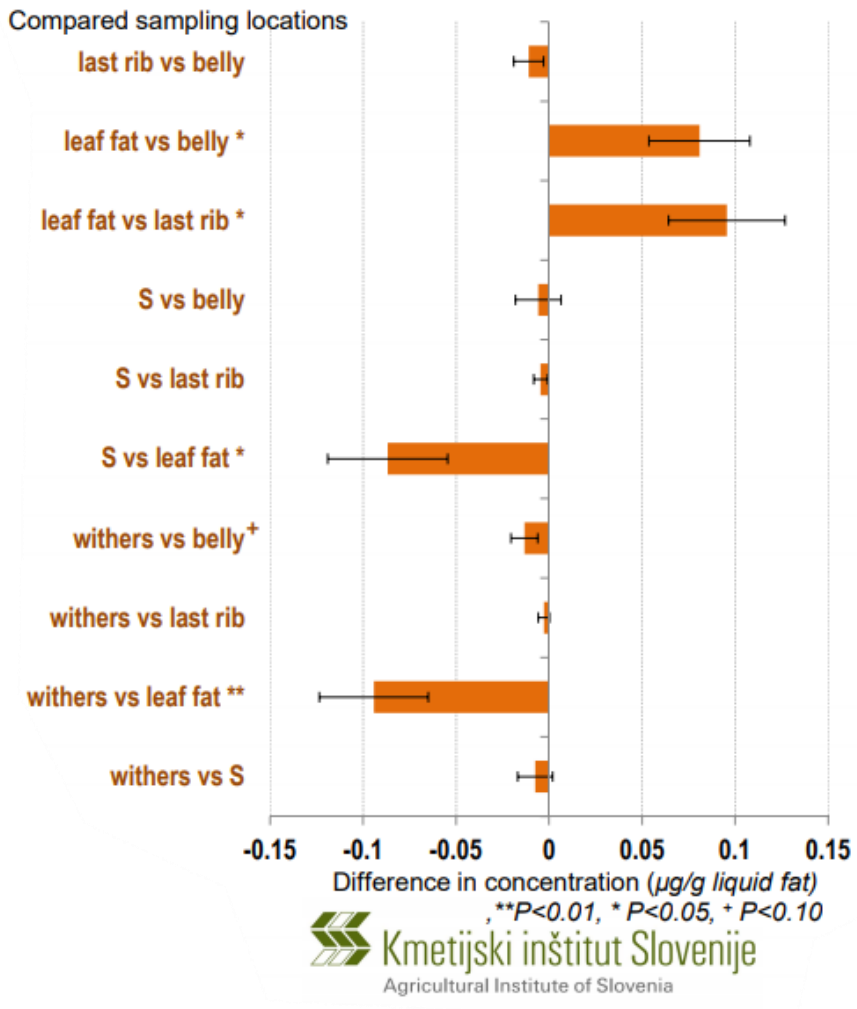


Fig. 1. Sampling procedure in different cuts along the carcass (N: neck; L: loin; H: ham; B belly).

SKA 5.9% higher right than left side

SKA 25.5% higher in the belly than in dorsal cuts

(Wesoly et al. 2016)



(Batorek-Lukač et al 2018)

At which place to measure boar taint is not defined

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BOAR TAINT CONTROL ON/AT LINE – Today's challenge

- no rapid technical method to be used on line to detect boar taint

- cut-off levels to guarantee consumer acceptance are not defined and depend on a lot of parameters

- at which place to measure boar taint is not defined

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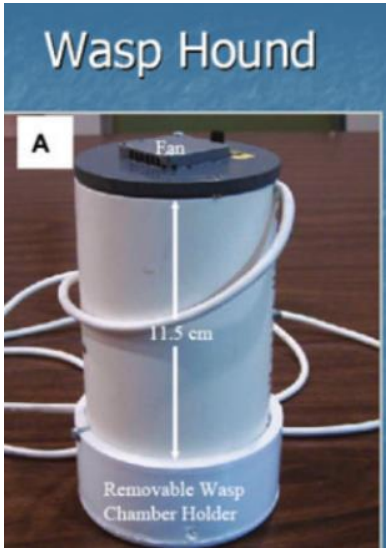
BOAR TAINT CONTROL ON/AT LINE – Near (?) Future

- Advances in knowledge of HN

- Development of sensors



Insect-based biosensors (Wäckers et al, 2011)
Patented US13590272 (USDA, Tifton, Georgia, USA)

Electrochemical biosensors (Crew et al., 2009)
UK patent application n. UK1212727

New spectroscopic sensors?

IRTA https://www.researchgate.net/publication/51091768_Boar_Taint_Detection_Using_Parasitoid_Biosensors

BOAR TAINT CONTROL ON/AT LINE – Near (?) Future

- Development of new instrumental on/at line methods

Raman spectroscopy

-SKA R^2=0.87, accuracy >0.88

-AND, R^2=0.80, accuracy>0.93

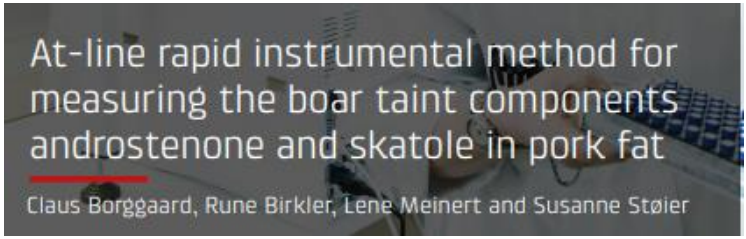
(Sørensen et al., 2015; Wang et al., 2014)

-Boar taint (45-72% correctly classified; Liu et al., 2016)

Mass spectroscopy

Reproducibility
AND 3% relative CV
SKA 5% relative CV

2017 CORK IRELAND ICoMST



https://www.dti.dk/international/icomst-2017/at-line-rapid-instrumental-method-for-measuring-the-boar-taint-components-androstenone-and-skatole-in-pork-fat/38676,2

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IPEMA- *CA15215*

Innovative approaches in pork production with entire males

WG4

"Innovation of grading and meat quality control systems"

It aims to go further than lean meat content by including traits that are important for processing, eating quality and detection of boar taint on the slaughter line.

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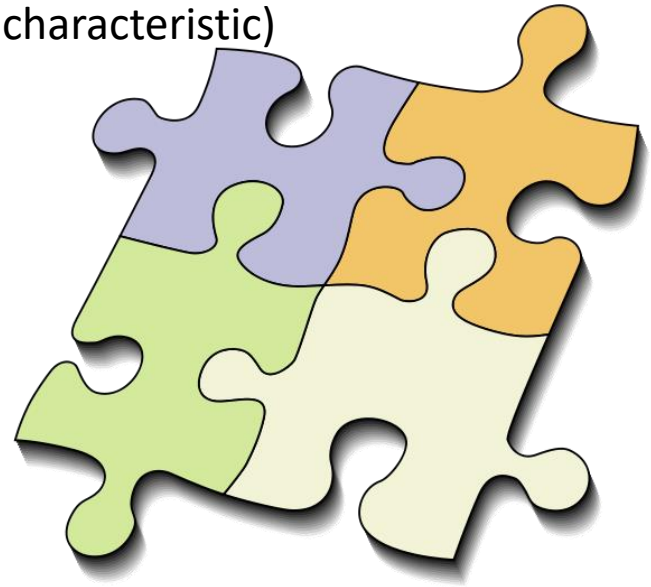
REQUIREMENTS

- To achieve that we need methods/technologies:
  - Fast
  - Non-destructive (and/or non-invasive)
  - Automatic / semi-automatic
  - On-line / at-line
  - Accurate and precise (repeatability, reproducibility, sensitivity, specificity)
  - Cost-effective
  - Multi-uses (able to predict more than one characteristic)
  - Correlated with consumer perception
  - …



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