

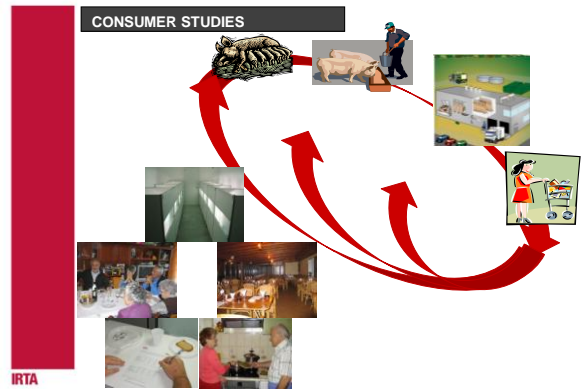
# CONSUMER STUDIES. WHAT CAN WE CONCLUDE?

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62<sup>nd</sup> Annual Meeting EAAP

Stavanger, Norway

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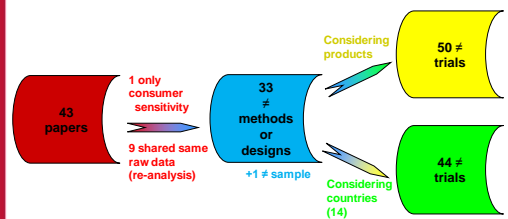
## DESIGN OF CONSUMER STUDIES

- PRODUCT / MUSCLE EVALUATED
- TEST LOCATION: home test, hall test
- METHODOLOGY USED IN SAMPLE PREPARATION
- METHODOLOGY TO DETERMINE BOAR TAIN COMPOUNDS
- TYPE OF SAMPLES (SEX, AND & SKA LEVELS,...)
- QUESTIONNAIRE: ATTRIBUTES AND SCALE
- CONSUMER'S PROFILE
- INFORMATION PROVIDED TO THE CONSUMERS
- SENSITIVITY TO ANDROSTENONE
- PRESENTATION OF RESULTS AND DATA ANALYSIS



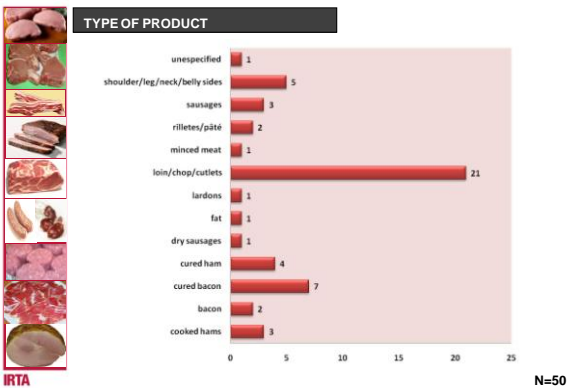
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## CONSUMER STUDIES IN THE LITERATURE



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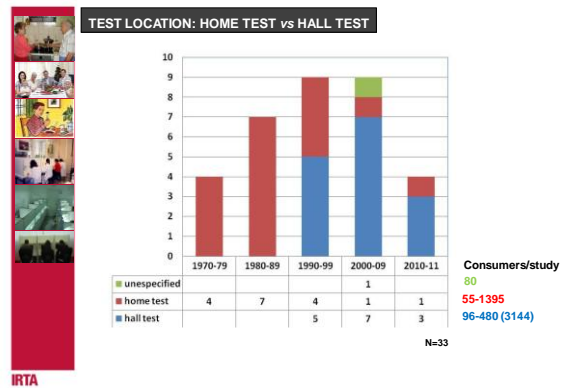
## TYPE OF PRODUCT



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N=50

## TEST LOCATION: HOME TEST vs HALL TEST



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N=33

**TEST LOCATION: HOME TEST vs HALL TEST**

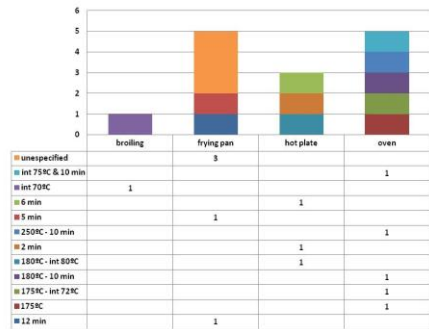
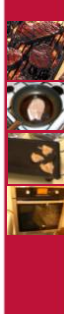


- HOME TEST**
  - High variability in pork preparation
  - Need of more consumers & samples
  - Low-medium % returned questionnaires
  - Conditions close to consumption reality
- HALL TEST**
  - Controlled conditions
  - Less consumers and samples
  - All the questionnaires recovered
  - Less similar to consumption reality

**What is the best? It depends on the objectives of the study**  
 Comparison, cross-cultural studies,...at same conditions  
 Enhance the problem  
 'Real' situation

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**COOKING PROCEDURE- HALL TESTS**



N=13

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**COOKING METHOD & TEMPERATURE**



**COOKING METHOD???**

Variability between consumers studies in cooking methodology. Is it good?  
 No, if we want to compare (at the same conditions)  
 Yes, if we want to have representation of all type of cooking  
 Harmonization of cooking methods/temperature could be risky

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**SAMPLES: SEX OF THE PIGS**

Loins/chops/cutlets (N=21)

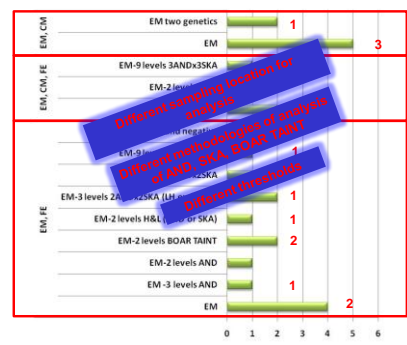


N=34

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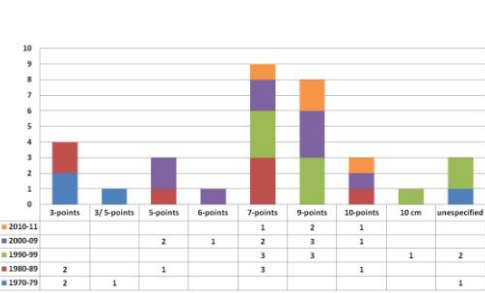
**SAMPLES: TYPE OF ENTIRE MALES**

Loins/chops/cutlets (N=16)



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**LEVELS OF THE EVALUATION SCALE**



N=33

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### LEVELS OF THE EVALUATION SCALE



Greater number of scale categories →  
Finer discrimination among stimulus.  
Most respondents cannot handle more than a few categories.



Optimal: between 5 and 9 → no single optimal number of categories

(Malhotra, 2006)

Midpoint of the scale (neither like nor dislike,...) → optional

-Apathy option?

-Easiest response? → Force consumers (Guerrero, 1999)

Can the scale be harmonized? **Yes**

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### ATTRIBUTES EVALUATED

Acceptability or pleasantness or liking → odour or flavour or overall

Strength odour or flavour → while cooking or in the dish

Fatness, tenderness, juiciness,...

Acceptability compared with normal

Abnormal odour and taste, in-mouth feeling, ...

In 33 different consumer studies:

|                       |    |
|-----------------------|----|
| Odour acceptability   | 20 |
| Flavour acceptability | 18 |
| Overall acceptability | 15 |
| Tenderness            | 11 |
| Cook liking           | 8  |
| Juiciness             | 5  |



CONCLUSIONS

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### RESULTS



Proportion of consumers who react negatively,  
% of dissatisfied/satisfied consumers

Different appreciation depending on the sex

Average of acceptability or intensity scores



EM accepted as itself

Lower acceptability EM

Acceptability EM depends on BOAR TAINT level

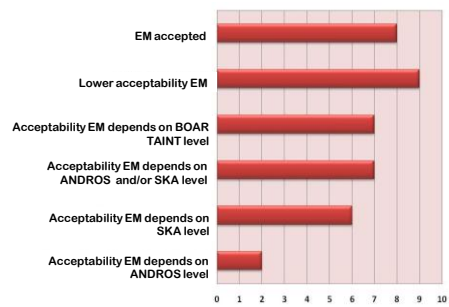
Acceptability EM depends on AND and/or SKA levels

Acceptability EM depends on SKA level

Acceptability EM depends on AND level

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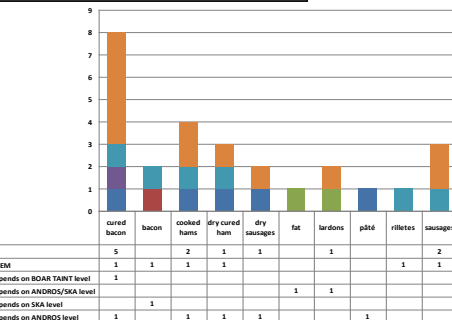
### CONCLUSIONS FRESH MEAT



N=39

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### RESULTS PORK PRODUCTS: CONCLUSIONS



N=27

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### RESULTS: SENSITIVITY TO ANDROSTENONE



4 methods to determine consumer sensitivity:



Sippet

previously dipped in a solution of androst (100ug/ml in ethanol)

Scratch-and-sniff panels

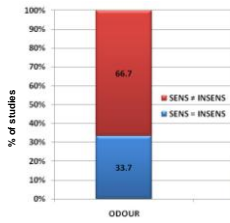
with droplets of odourant surrounded by long chain polymers

Sensitive consumers (%):

| Country | Total       | Women       | Men         |
|---------|-------------|-------------|-------------|
| BE      | 45.3        | 51.1        | 34.5        |
| DE      | 17.6        | 19.3        | 15.6        |
| ES      | 30.9 - 47.5 | 37.3 - 53.6 | 23.7 - 45.5 |
| FR      | 44-57       | 59.2        | 55.6        |
| NO      | 39-45.5     | 46.4        | 26.3        |
| UK      | 47.6        | 58.9        | 36.5        |

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## RESULTS: SENSITIVITY TO ANDROSTENONE



Acceptability of boar meat depends on the sensitivity of the consumers to androstenone. Sensitive consumers have lower odour acceptability scores than insensitive.

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## WHAT CAN WE CONCLUDE?

- There is a high variability among consumer studies.
- In some aspects this variability enriches the results, but in some others it makes more difficult to draw conclusions.
- Boar taint affects at consumers' acceptability of boar meat.
- Acceptability depends on the levels of androstenone and/or skatole, being skatole the most important (when sensitivity was not considered).
- Some studies conclude that acceptability of boar meat could depend on other compounds. Except in a recent study.
- Acceptability of boar meat also depends on the sensitivity of consumers' to androstenone (that depends on the gender).
- Cooking and temperature of the samples produce different perception of boar taint or its compounds → how do this affect at consumer response?
- We cannot establish thresholds for androstenone and skatole → Harmonization of analytical methodologies is needed (or relationship between them).

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## CONSIDERATIONS

Do we need harmonized methods for consumer studies?

Yes, if the objective is compare between studies: cross-cultural studies

No, if we want to mimic the usual methodology or if the objective is to evaluate a specific methodology

But, maybe some aspects could be harmonized

*Variety is the spice of life but...  
Homogeneity makes the things much easier*

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## CONSIDERATIONS

What should be harmonized:

- Methods of analysis of androstenone and skatole (or find relationship between them)
- Type of sample and location used for the chemical analysis
- Attributes to evaluate (but open to others)
- Scale of evaluation of the attributes by consumers
- Thresholds? (when methods would be standardized → fix threshold with a trained panel)

*Homogeneity makes the things much easier, but...  
Variety is the spice of life*

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As a consumer... enjoy the pork meat free of boar taint, prepared the way you prefer the best.

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**Thank you for your attention**

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