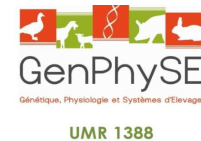




Growing  
**ideas**  
through  
**networks**

# Genetic determinism of boar taint and relationship with meat traits.

Claire DUGUÉ – Oieras – February 2018





# Introduction

The purpose of this study is :

- To evaluate the feasibility of a selection to decrease the androstenone level in back fat
- To evaluate the feasibility of an indirect selection on androstenone level by decreasing the level of estradiol in the blood, criteria highly correlated to androstenone level and easier to measure
- To evaluate the consequences that these selections could have on meat production and quality traits in purebred or crossbred pigs.

# Material and method

- Population : Pietrain (P) and Pietrain Large White (X) pigs with same Pietrain boars.
- Raised in the same farm in case of 12 by genetic type
- Measured traits :



## Growth traits

- Average daily gain
- Feed conversion ratio
- Average daily feed intake

## Carcass composition

- Carcass yield
- Lean percentage

## Hormones

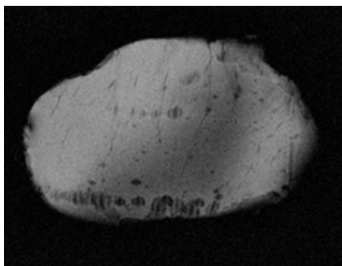
- Estradiol
- Testosterone

## Skin lesions

- At fattening stage entrance
- Before slaughtering
- On carcass



# Material and method



Meat quality	Computerized tomography (CT) measures
<ul style="list-style-type: none"><li>• pH in Ld and ham</li><li>• Drip loss</li><li>• Intramuscular fat</li><li>• Back fat androstenone level</li></ul>	<ul style="list-style-type: none"><li>• Loin eye area</li><li>• Loin eye density</li><li>• Femur density</li><li>• Ham muscle/ bone length ratio</li></ul>

- The number of measured animals varied from 712 P and 736 X for growth traits down to 553 P and 556 X for CT measurements.
- Genetic parameters were estimated with the VCE6 software.

# Results : Heritability of Estradiol level and Androstenone back fat concentration

Trait	$h^2$ in P pigs	$h^2$ in X pigs
Androstenone	0.57	0.71
Estradiol	0.23	0.17

- Back fat androstenone level and plasma estradiol level are highly correlated traits ( $r_g=0.89$  in purebred and  $r_g=0.8$  in crossbred)
- We evaluated the correlated effects on the meat production traits of :
  - a direct selection to reduce androstenone
  - an indirect selection by decreasing the level of estradiol.

# Results : Effects of selection to decrease androstenone in purebred pigs.

High correlation:  $\geq 0.8$   
Moderate correlation: around 0.6  
Low correlation: around 0.4

Favorable effects on purebred pigs :

- Moderate increase of **ham muscle/bone length ratio**,
- Low decrease of **feed conversion ratio**,
- Low increase of **pH in ham**.

Unfavorable effect on purebred pigs :

- High decrease of **testosterone** concentration.

# Results : Effects of selection to decrease androstenone in purebred pigs.

Favorable effects on crossbred pigs :

High correlation:  $\geq 0.8$   
Moderate correlation: around 0.6  
Low correlation: around 0.4

- High decrease of **skin lesion number at fattening stage entrance**,
- Moderate decrease of **feed conversion ratio**,
- Moderate increase of **carcass yield**,
- Moderate increase of **loin eye area**,
- Low decrease of **drip loss**,
- Low decrease of **average daily feed intake**,
- Low increase of **lean percentage**,
- Low increase of **ham muscle/bone length ratio**.

Unfavorable effect on crossbred pigs :

- Low decrease of **femur density**.

# Results : Effects of selection to decrease estradiol in purebred pigs.

High correlation:  $\geq 0.8$   
Moderate correlation: around 0.6  
Low correlation: around 0.4

Favorable effects on purebred pigs :

- High decrease of **androstenedione** concentration,
- Moderate decrease of **feed conversion ratio**,
- Low decrease of **average daily feed intake**.

Unfavorable effect on purebred pigs :

- High decrease of **testosterone** concentration.



# Results : Effects of selection to decrease estradiol in purebred pigs.

High correlation:  $\geq 0.8$   
Moderate correlation: around 0.6  
Low correlation: around 0.4

Favorable effects on crossbred pigs :

- High decrease of **androstenone** concentration,
- High decrease of **skin lesion number at fattening stage entrance**.

Unfavorable effect on crossbred pigs :

- High decrease of **testosterone** concentration.

# Conclusion

- A selection to decrease the androstenone level is feasible and would have overall positive effects on meat production and quality traits, and behaviour related traits.
- A selection to reduce the estradiol level would reduce the androstenone level and the only undesirable effect would be to decrease testosterone level.
- This selection is technically easier (blood test) opposed to measuring androstenone level (post mortem or biopsy) and has less unfavorable effects on production traits; it might be preferred.

# Further studies

- We should now standardize estradiol measurement to increase heritability:
  - Measure closer to slaughter
  - Measure at fixed age
- We should also evaluate the effects of these selections on reproductive traits.



**Thank you for  
your attention**

*The authors acknowledge support from the  
COST action CA12215 IPEMA*