The *MC4R* gene affects puberty attainment in gilts but not in boars

Alice Van den Broeke, Marijke Aluwé, Liesbeth De Wilde
Frank Tuyttens, Sam Millet
Nadine Buys, Steven Janssens

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Institute for Agricultural and Fisheries Research
Animal Sciences Unit
www.ilvo.vlaanderen.be

Introduction

Boar taint: off-odor present in **heated meat** or **fat**

- **Genetic selection**

Melanocortin 4 receptor (Asp298Asn polymorphism):
A allele associated boar taint (Schroyen *et al.*, in press)

Androstenone related to testosterone

- Previous research: ↓ **androstenone, delay of puberty**

Androstenone = **pheromone**

Objectives

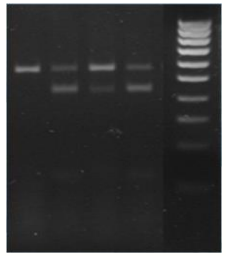
Aim of study:

- Effect on **behavior**
- Effect on **puberty attainment**

Experimental design

- **interventional** study
- offspring of a **commercial cross** (hybrid sow X Piétrain)
- Homozygous littermates of AG sow x AG sire

n	EM	G
AA	6ˣ11	6ˣ11
GG	6ˣ11	6ˣ11



- **Slaughter: intended average live weight of 110 kg**

Material and methods

Behavior and **skin lesions**:
observations 11 occasions
(8 weeks-slaughter)

Puberty gilts**:**

- **Ovaries** at slaugther

Puberty entire males:

- Preputial smear test

- **Testosterone** concentration

- **Testes weight** at slaughter

Behavior

Passive and eating behavior

Scan sampling on 11 occasions

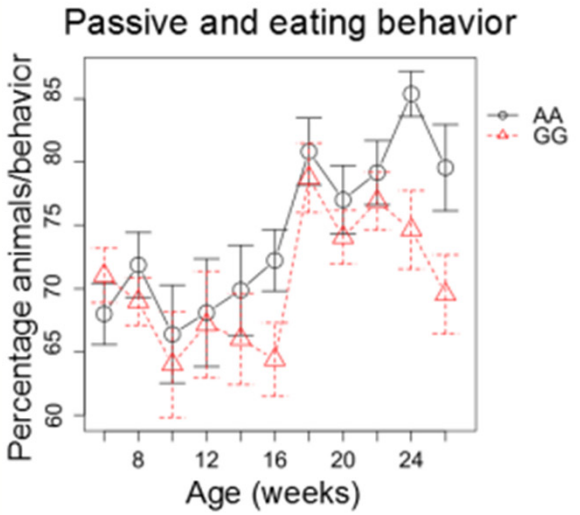
Behavioral problems

Active behavior

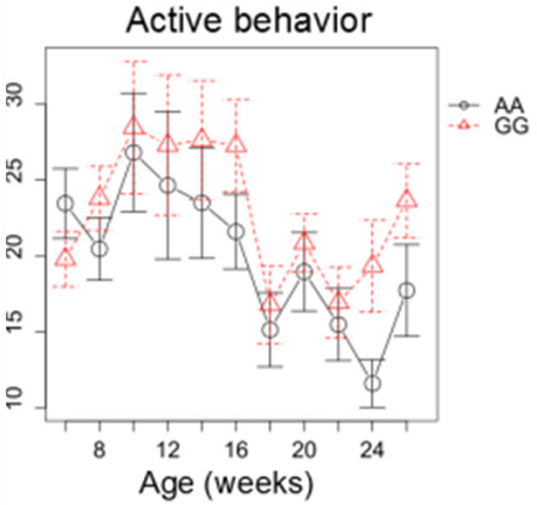
Sexual behavior

Aggressive behavior

Behavior



P=0.003



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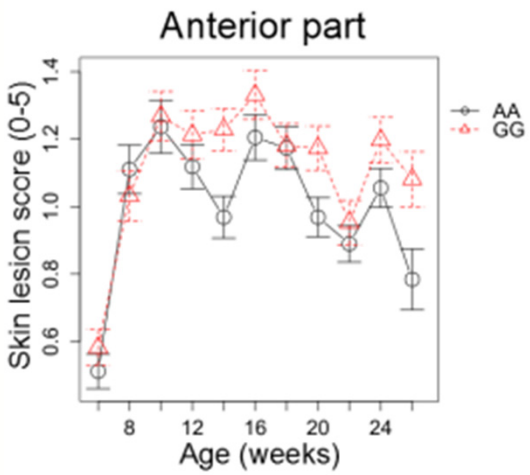
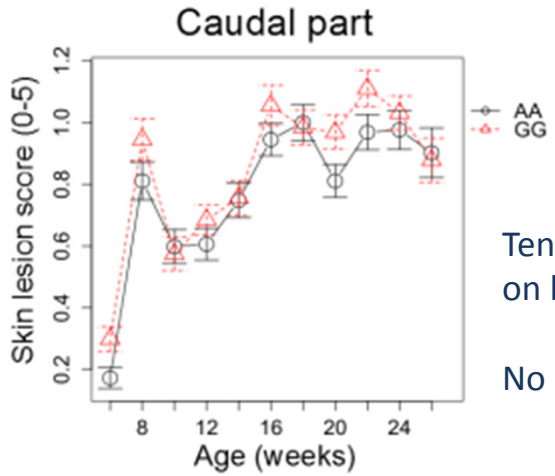
AA animals: more boar taint
GG animals: less boar taint

Skin lesions and lameness





Tendency to effect on back (P=0.067)

No effect on lameness

P=0.043

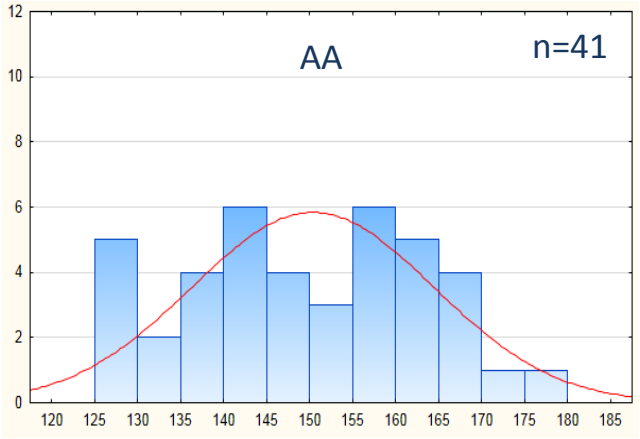
P=0.028

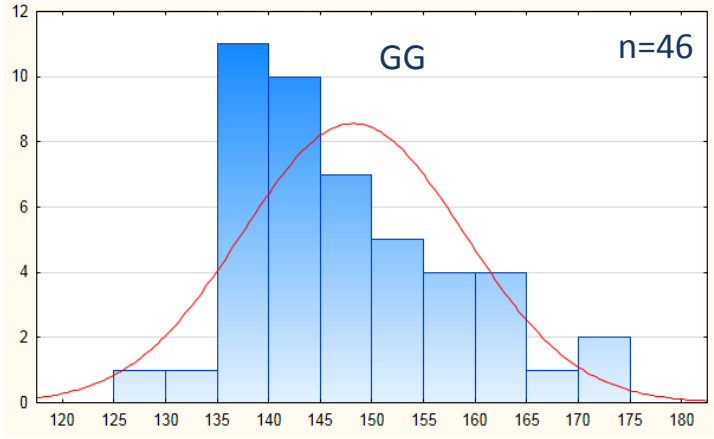
AA animals: more boar taint
GG animals: less boar taint

Puberty entire males

Preputial smear test:
Aim: estimate the **start** of **puberty**
Start of puberty: moment **first sperm cell**
Swabs: weekly, 2 days/week starting at 16 weeks of age
Sperm cells present in fluid preputium

Swabs: Age





Mean age first positive swab

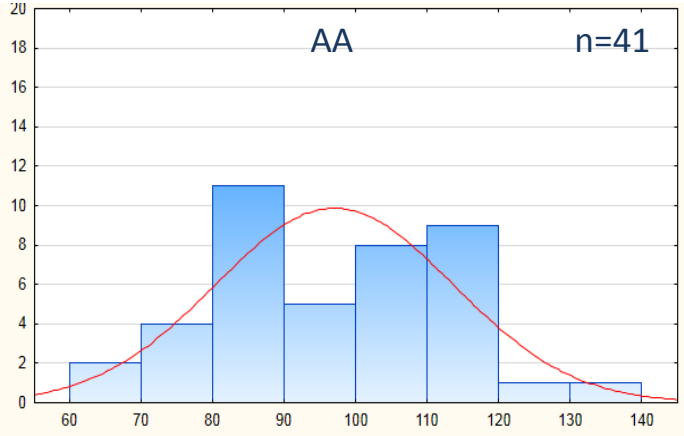
P=0.385

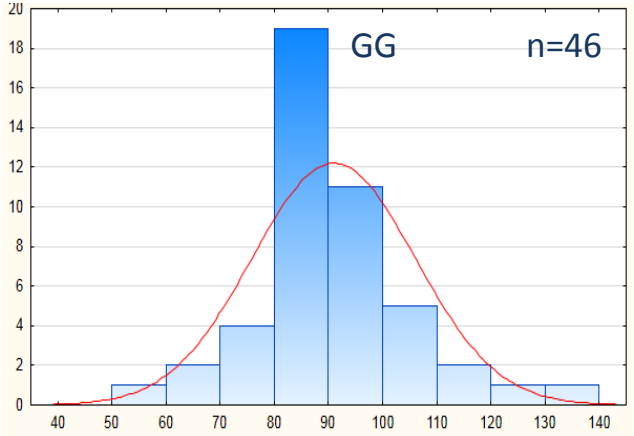
Mean: 150 d
Median: 150 d

AA animals: more boar taint
GG animals: less boar taint

Mean: 148 d
Median: 145 d

Swabs: weight





Mean weight first positive swab:

97 kg

91 kg

P=0.065

AA animals: more boar taint
GG animals: less boar taint

Performances

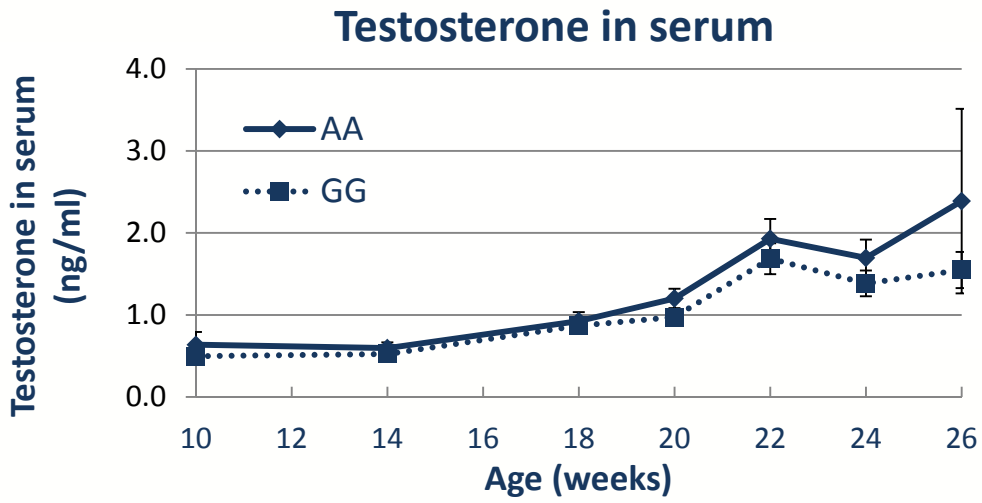
(talk session 13)

AA		GG
↑	ADFI	↓
↑	DG, EM	↓
↓	Meat percentage	↑
↑	Back fat	↓

AA animals: more boar taint
GG animals: less boar taint

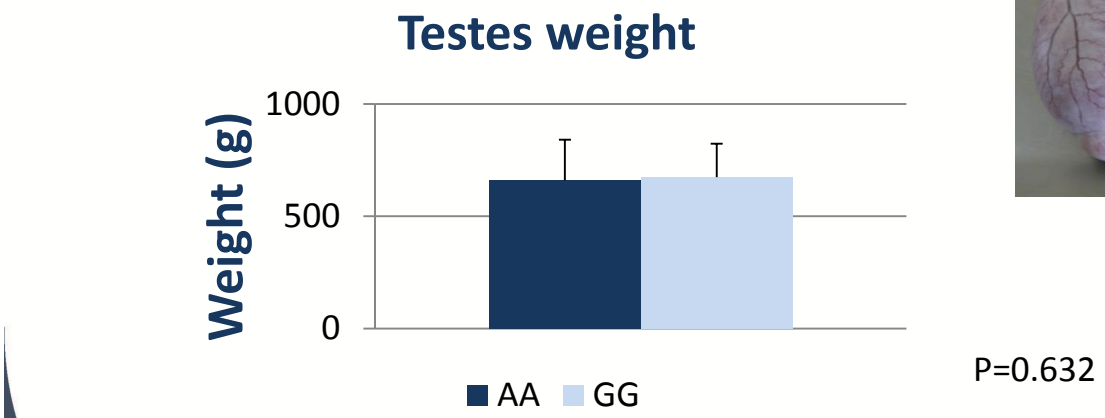
Testosterone

P=0.134



No effect genotype on concentration of testosterone

Testes weight



P=0.632

AA animals: more boar taint
GG animals: less boar taint

Puberty gilts

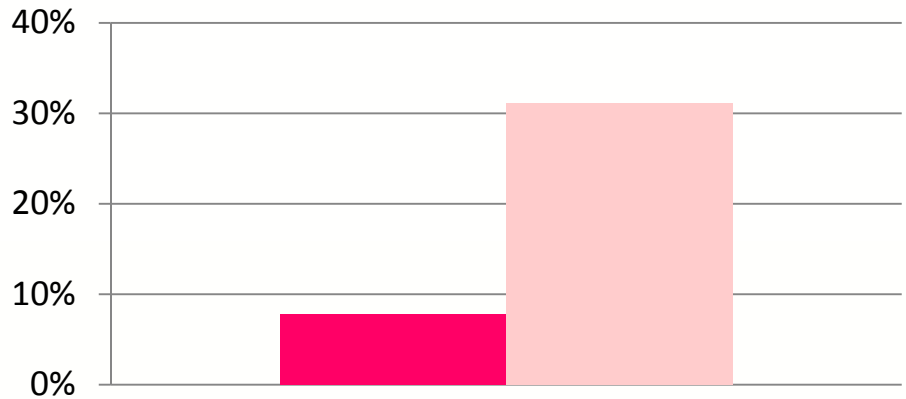
Puberty gilts

- ovaries in slaughter house: presence follicles / corpora lutea

Non-cycling ovary

Ovary with several CL

Puberty gilts



P<0.001

AA animals: more boar taint
GG animals: less boar taint

Puberty gilts

	AA	GG	SEM	P-value
Percentage cycling gilts, %	8	31		< 0.001
Slaughter age, days	180	182	0.761	0.954
Slaughter weight, kg	112.8	112.5	0.747	1.000
Meat percentage	63.0	64.4	0.154	< 0.001

No correlation between cycling and fat thickness, meat thickness or meat percentage

Conclusion

Selection towards **lower prevalence** of boar taint:

More **active animals**
More skin lesions at **anterior** and **caudal** part (and back)
No effect on lameness

Entire males: no effect on testes weight, testosterone concentration, mean age first positive swab
Tendency to **lower weight** first positive swab

Gilts: **Higher** percentage **cycling gilts**

Thank you for your attention !

Alice.vandenbroeke@ilvo.vlaanderen.be

Institute for Agricultural and Fisheries Research
Animal Sciences Unit

Pig Research Area
Scheldeweg 68
9090 Melle - Gontrode
Tel. +32 9 272 26 00

www.ilvo.vlaanderen.be

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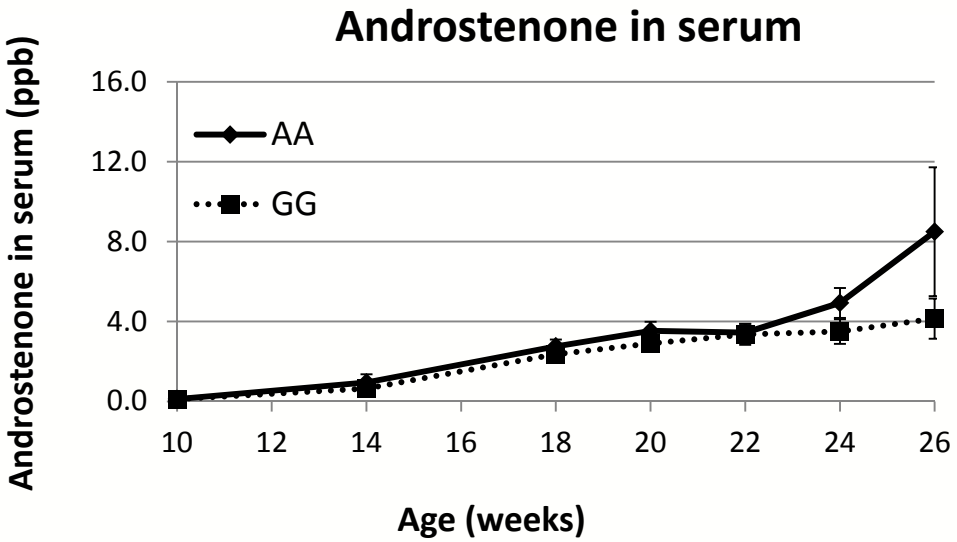
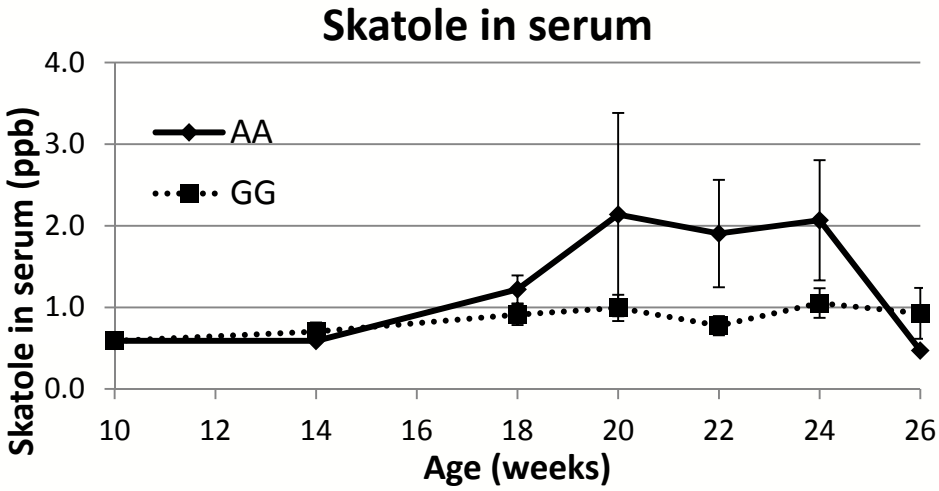
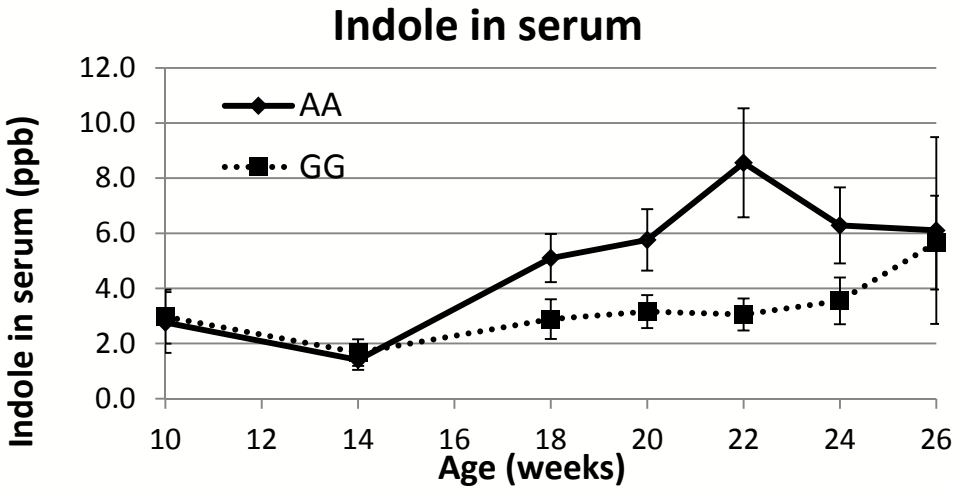

Androstenone in serum
Androstenone in serum (ppb)
16.0
12.0
8.0
4.0
0.0
AA
GG
10
12
14
16
18
20
22
24
26
Age (weeks)

P=0.003


Skatole in serum
Skatole in serum (ppb)
4.0
3.0
2.0
1.0
0.0
AA
GG
10
12
14
16
18
20
22
24
26
Age (weeks)

P=0.074


Indole in serum
Indole in serum (ppb)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
AA
GG
10
12
14
16
18
20
22
24
26
Age (weeks)