SNP's in three different genes involved in fat storage are not associated with boar taint in Belgian pig breeds

KATHOLIEKE UNIVERSITEIT LEUVEN

M. Schroyen[a], S. Janssens[a], A. Stinckens[a], M. Brebels[a], F. Bertolini[a], C. Lamberigts[a], S. Millet[b], M. Aluwé[b], D. De Brabander[b], N. Buys[a]

[a] Livestock Genetics, Department of Biosystems, KU Leuven, Kasteelpark Arenberg 30, BE-3001 Heverlee, Belgium
[b] Animal Sciences Unit, Institute for Agricultural and Fisheries Research (ILVO), Scheldeweg 68, BE-9090 Melle, Belgium

INTRODUCTION

PROBLEM? Boar taint = an offensive odour and flavour in the cooked meat of some entire male pigs
→ due to elevated levels of **androstenone and skatole** in fat tissue

SOLUTION? Genetic predisposition to boar taint so selection for lower incidence (combined with detection in the slaughter line) could provide a solution for the problem.
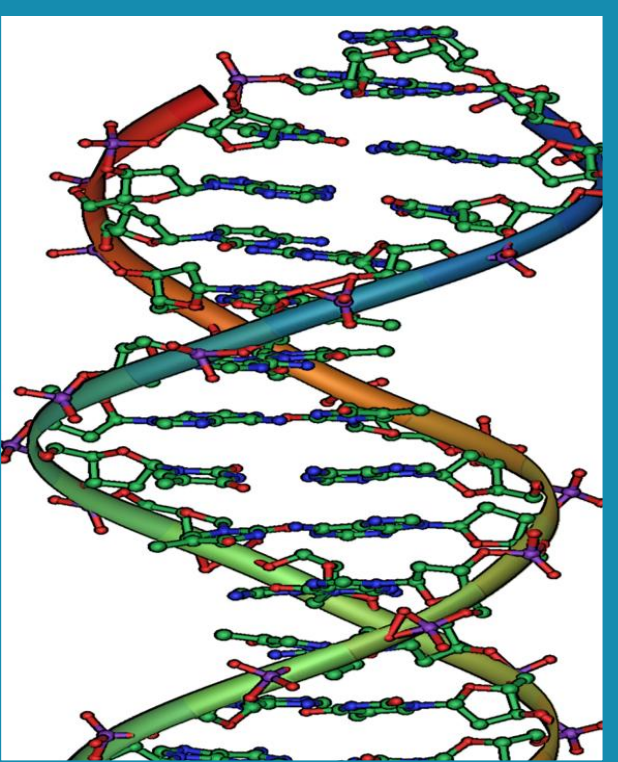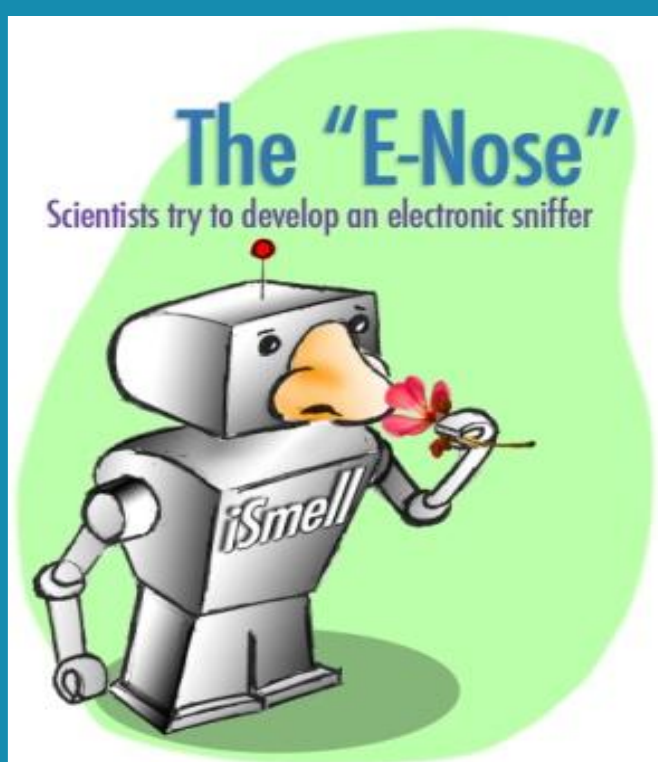
AIM OF THE STUDY

Many candidate genes → often associated with reproduction

Circumvent co-selection of undesired reproduction characteristics

In this study → focus on **STORAGE IN FAT TISSUE**

SNP in *apolipoprotein M* (**APOM**_intron2: g2289 G > C)
SNP in *leptin* (**LEP**_exon3 : g.3469 C > T)
SNP in *lipin-1* (**LPIN-1**_exon2 : c.93 C > T)

ANIMALS, MATERIALS & METHODS

▫ **Experiment 1**
Animals: Purebred Landrace, Large White, Piétrain and crossbreds from Belgian herds
Boar taint scored by '*microwave method*'

▫ **Experiment 2**
Animals: Purebred Landrace, Large White and Piétrain
Boar taint scored by '*hot iron method*'

▫ **SNP analysis**
PCR with Restriction Fragment Length Polymorphism (PCR-RFLP with *Eco130*I, *Hinf*I and *Hinc*II)

RESULTS

Belgian breeds	Boar taint positive
Landrace	5.94 %
Large White	4.39 %
Piétrain	3.38 %
Crossbreds (Belgian herds)	5.00 %

Distribution of genotypes	Experiment 1 boar taint		Experiment 2 boar taint	
	+	-	+	-
SNP APOM				
GG	16	17	33	31
GC	0	0	3	2
CC	8	5	6	6
p-value association of SNP with boar taint	p = 0.41		p = 0.93	
SNP LEP				
CC	0	0	0	0
CT	4	4	13	9
TT	24	23	36	31
p-value association of SNP with boar taint	p = 0.99		p = 0.58	
SNP LPIN-1				
CC	0	2	2	0
CT	7	4	11	7
TT	21	22	37	32
p-value association of SNP with boar taint	p = 0.68		p = 0.80	

CONCLUSION

Boar taint is an unpleasant odour and flavour in some entire male pigs. In this study, we examined the possibility to use SNP's in genes involved in fat storage in genetic selection against boar taint. The single nucleotide polymorphisms (SNP's) in *apolipoprotein M*, *leptin* and *lipin-1* were genotyped using PCR-RFLP. However, no associations between these SNP's and the presence of boar taint were observed, indicating that these SNP's cannot be of use in selection against boar taint in typical Belgian pig breeds.