

Fine mapping of production and meat quality QTL in Large White pigs using the *PorcineSNP60* Beadchip

S32 - 25

M.P. SANCHEZ*¹, T. TRIBOUT¹, N. IANNUCELLI², M. BOUFFAUD³, B. SERVIN², P. DEHAIS², N. MULLER³, M.J. MERCAT⁴, J. ESTELLE¹, J.P. BIDANEL¹, C. ROGEL-GAILLARD¹, D. MILAN², H. GILBERT²
¹INRA & AgroParisTech, UMR1313 GABI, 78350 Jouy-en-Josas; ²INRA, UMR444 LGC, 31326 Castanet-Tolosan; ³INRA, UE450 TP, 35651 Le Rheu; ⁴IFIP, 35651 Le Rheu; France. *marie-pierre.sanchez@jouy.inra.fr

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GWAS in a French Large White (FLW) population

using the Illumina *PorcineSNP60* Beadchip



Localise **QTL** segregating in the selection populations

Identify **haplotypes** associated with major effects

Animals - 389 FLW castrated males from 106 boars tested in Le Rheu test station

22 traits – growth rate, feed intake and feed efficiency (4), carcass composition(12) and meat quality (6)

Genotyping - 44,412 SNP retained after quality control

Genome Wide Association Analyses (GWAA) - FASTA method

Haplotype Analyses - Haploview & mixed model with multiple reg.

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99 significant results ($P < 10^{-4}$)
(4 expected false positives)

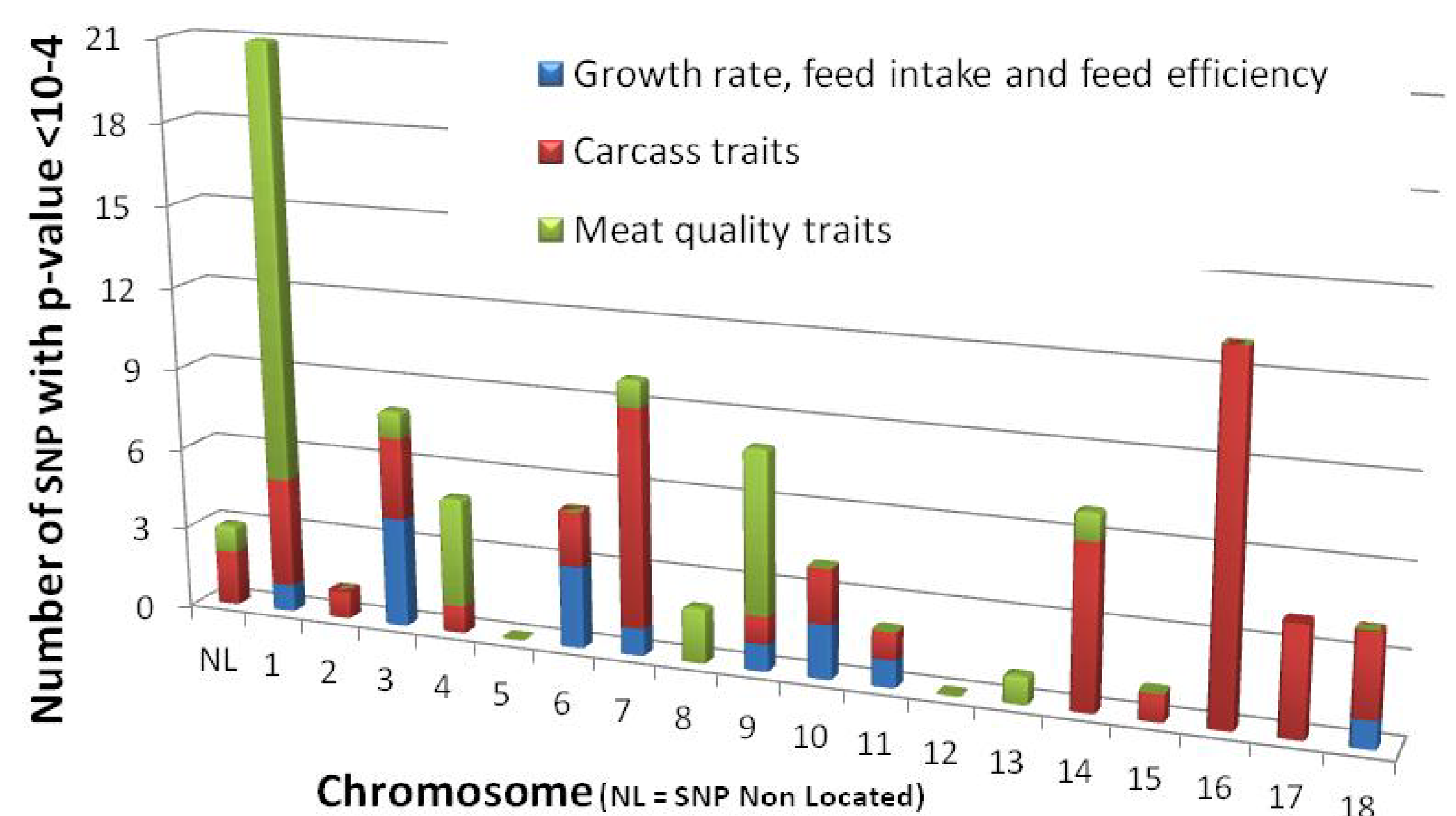


19 regions with at least 2 SNP with significant effect

3 for growth rate, feed intake and feed efficiency

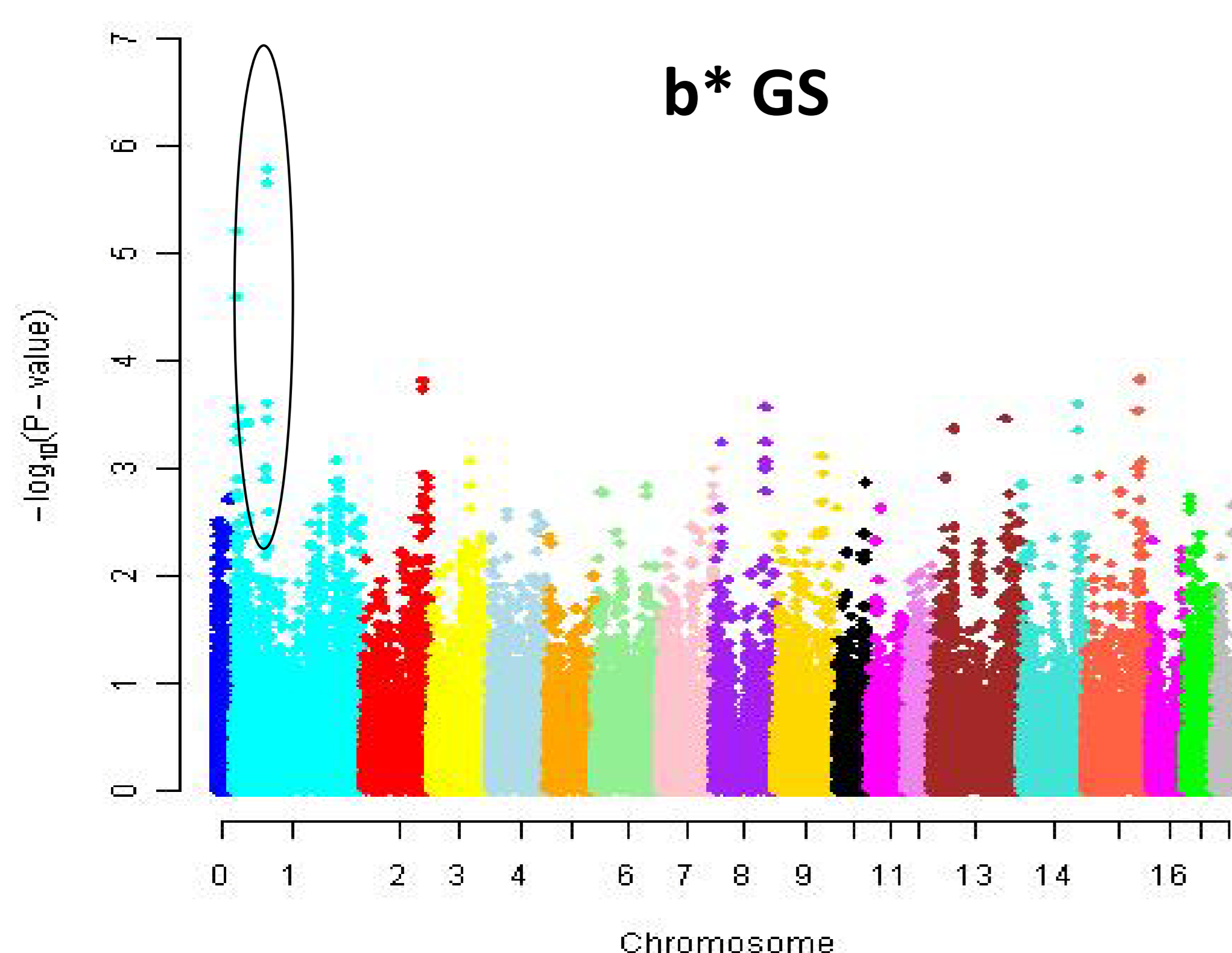
11 for carcass traits

5 for meat quality traits



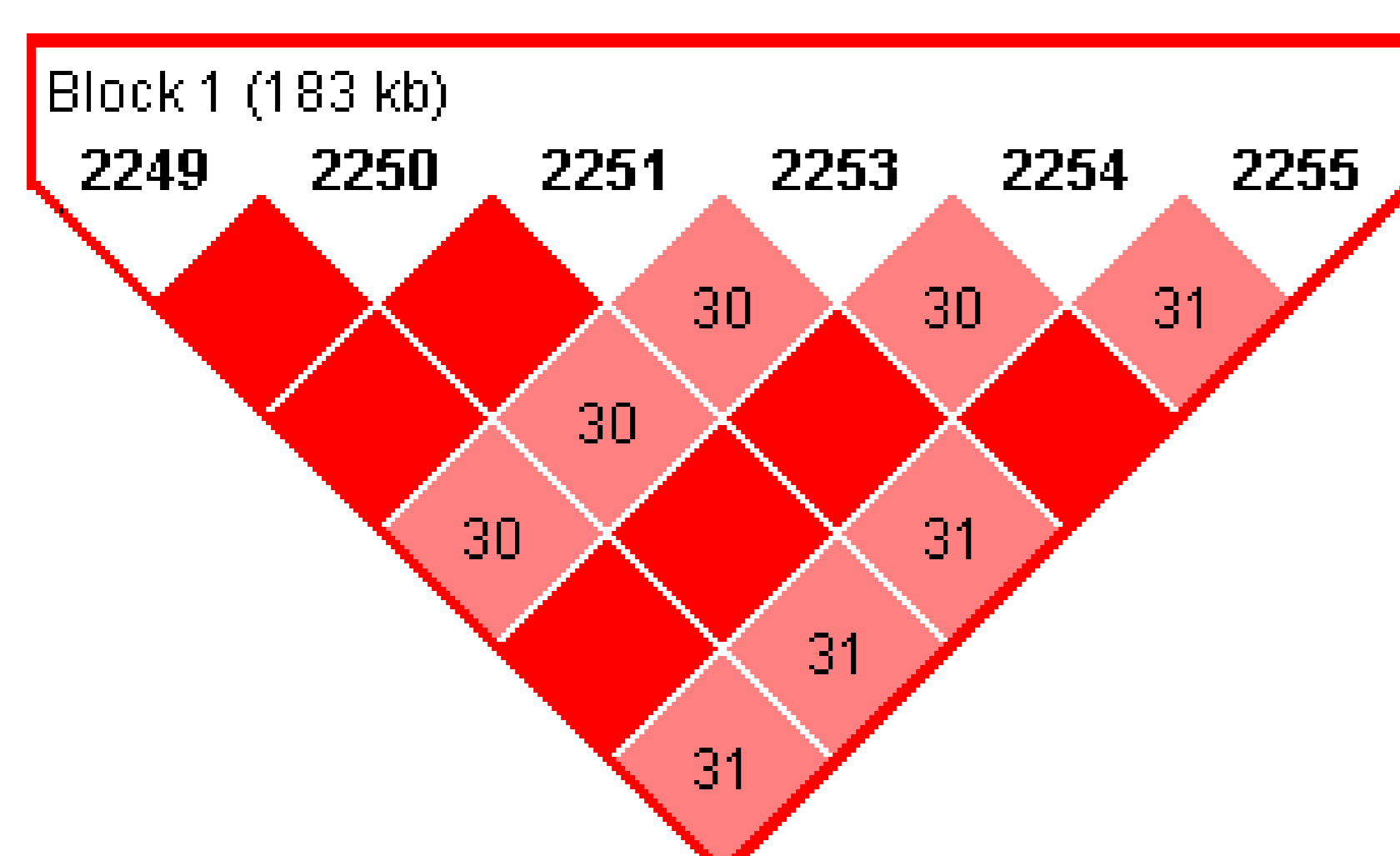
One region of special interest found on chromosome 1 for meat quality traits

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Chromosome 1

6 SNP haplotypic block of 183 kb



Effects on meat quality

& no effect on growth rate, feed intake, feed efficiency and carcass composition

Trait [§]	Standard deviation (SD)	p-value	Haplotypic effects in proportion of SD		
			ACTCTA	ACTTTC	GTCTCC
pH24 SM	0.15	0.0007	0.16 ^a	0.03 ^a	-0.19 ^b
L*GS	3.5	< 0.0001	-0.16 ^a	-0.14 ^a	0.30 ^b
a*GS	1.5	0.03	-0.13 ^a	0.042 ^{ab}	0.091 ^b
b*GS	1.4	< 0.0001	-0.18 ^a	-0.13 ^a	0.31 ^b
WHC (s)	59.6	0.01	0.14 ^a	-0.13 ^b	-0.016 ^{ab}
MQI (%)	2.5	< 0.0001	0.20 ^a	0.034 ^a	-0.23 ^b

[§] Semi Membranosus (SM) and Gluteus Superficialis (GS) muscles; Water Holding Capacity (WHC) of GS; Meat Quality Index (MQI); for a given trait, effects with different superscripts (^a or ^b) differed significantly

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2250
2251
2253
2254
2255

ACTCTA

freq 57%, favourable

ACTTTC

freq 24%, intermediate

GTCTCC

freq 19%, unfavourable

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Numerous SNP associated with production traits despite the limited number of tested pigs:

- ➔ **Confirm regions** detected in crossbred populations
- ➔ **Evidence new** regions for production and meat quality traits

6 SNP haplotype affecting meat quality traits only to be further explored for use in selective breeding



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