Poster Number: 61

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QTL DETECTION ON SSC12 FOR FATTY ACID COMPOSITION OF INTRAMUSCULAR FAT AND EVALUTATION OF PORCINE *ACLY* AS CANDIDATE GENE

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INTRODUCTION

- ❖ 3 SSC12 QTLs affecting backfat (BF) fatty acid (FA) composition were detected in a previous study in an experimental F2 cross Iberian x Landrace.
- ❖ Differences in FA profile have been reported between BF and Intramuscular fat (IMF).

→ **OBJECTIVES**

1. To carry out a QTL scan on SSC12 for fatty acid composition on IMF in the intercross Iberian x Landrace material.
2. To test porcine *ACLY* as a possible candidate gene underlying the detected QTL.

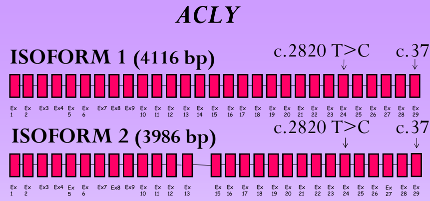
MATERIAL AND METHODS

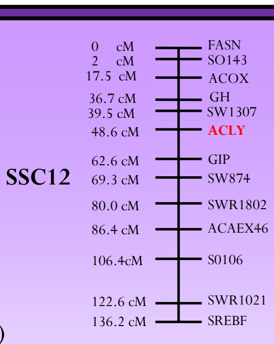
Iberian x Landrace

- **•56 F3**
- **•79 BC (F2xLandrace)**

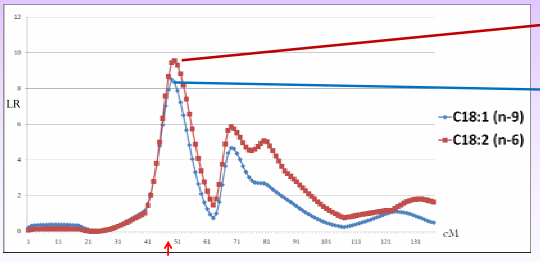
- ❖ 2 *Iberian* 2 *Landrace* → cDNA sequencing → SNPs detection
- ❖ **23 FA** measured on **IMF**
- ❖ **Genotyping of**
  - ✓ 7 SNPs on Candidate Genes: *ACACA, ACLY, ACOX, FASN, GH, GIP, SREBF*
  - ✓ 6 Microsatellites: *S0106, S0143, SW874, SWR1021, SWR1307, SWR1802*
- ❖ **Linkage mapping** of SSC12
- ❖ **Statistical models**
  1. QTL Model
  2. SNP Association Model
  3. SNP + QTL Model

RESULTS





1. QTL



-3.04 ± 0.96 ($P = 0.36 \times 10^{-2}$)

3.31 ± 1.10 ($P = 0.20 \times 10^{-2}$)

2. SNP *ACLY* 3757T>C

Trait	LR	P value	a (SE)
C18:1 (n-9)	6.32	0.12×10^{-1}	-1.14 (0.44)
C18:2	5.63	0.18×10^{-1}	0.93 (0.39)

3. *ACLY* 3757T>*C* + QTL

	QTL + SNP				QTL				SNP		
Trait	**Position**	**LR**	***P* value**	**QTLa (SE)**	**Position**	**LR**	***P* value**	**QTLa (SE)**	**LR**	**P value**	**SNPa (SE)**
C18:1 (n-9)	48	13.92	0.95×10^{-3}	3.10 (1.10)	48	7.60	0.58×10^{-2}	3.10 (1.10)	7.94	0.48×10^{-2}	-1.27 (0.44)
C18:2	50	13.99	0.91×10^{-3}	-2.79 (0.95)	50	8.36	0.38×10^{-2}	-2.80(0.94)	6.97	0.83×10^{-2}	1.04 (0.34)

REMARKS

- ❖ The detected QTL does not match the QTLs for fatty acid composition of BF previously located on SSC12.
- ❖ These results support the hypothesis of different genetic control underlying FA metabolism on IMF and BF.
- ❖ The model fitting both QTL and SNP provides the best explanation of the observed effects on C18:1 and C18:2