Effects of prolactin and prolactin receptor polymorphism upon milk composition and milk coagulation properties in Assaf ewes.

MR Marques*[1,2], DS Ribeiro[3], S Gomes[4], AT Belo[1], JR Ribeiro, AP Martins[4,5], CC Belo[1]

[1] UEISPSA, INIAV - Instituto Nacional de Investigação Agrária e Veterinária I.P., Vale de Santarém, Portugal, [2] CIISA - Centro de Investigação Interdisciplinar em Sanidade Animal, Lisboa, Portugal, [3] ESAC – Escola Superior Agrária de Coimbra, Coimbra, Portugal, [4] UTI, INIAV - Instituto Nacional de Investigação Agrária e Veterinária I.P., Oeiras, Portugal, [5] LEAF – Linking Landscape, Environment, Agriculture and Food, ISA, Lisboa, Portugal

1 - Introduction

➢ Sheep milk is used for cheese-making
➢ Cheese yield and quality depend on milk composition and coagulation properties
➢ Prolactin (PRL) and PRL receptor (PRLR) genes regulate milk synthesis

2 - Objectives

Identify SNPs in PRL and PRLR genes associated with milk composition and coagulation properties in Assaf ewes

4 - Conclusions

SNPs affect milk quality traits and coagulation properties on the 30 and 90 days of lactation in Assaf ewes:

PRL gene:
✓ rs406266481 – fat free total solids content
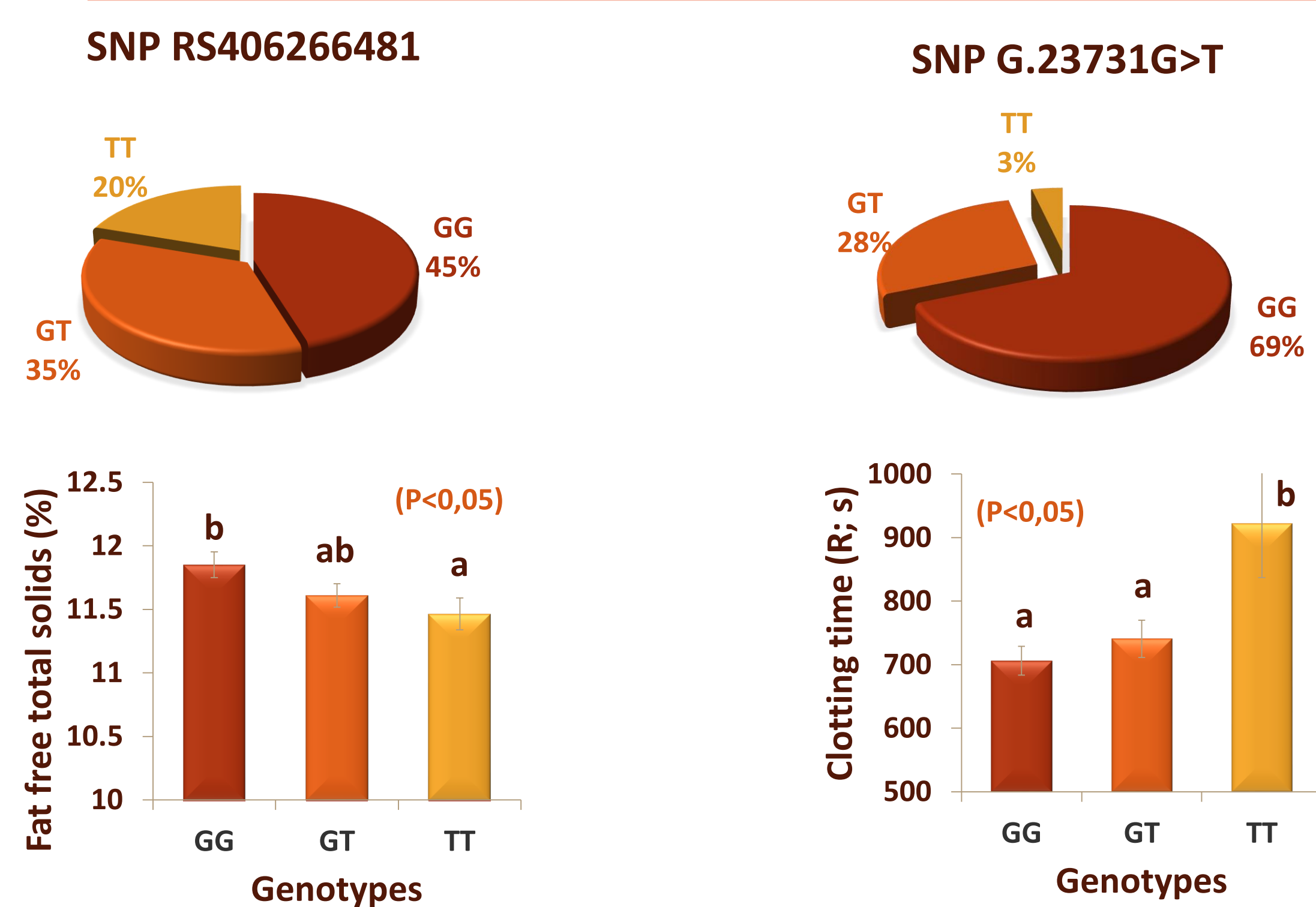✓ AMGL02030943.1:g.23731G>T and rs408430940 – clotting time

PRLR gene:
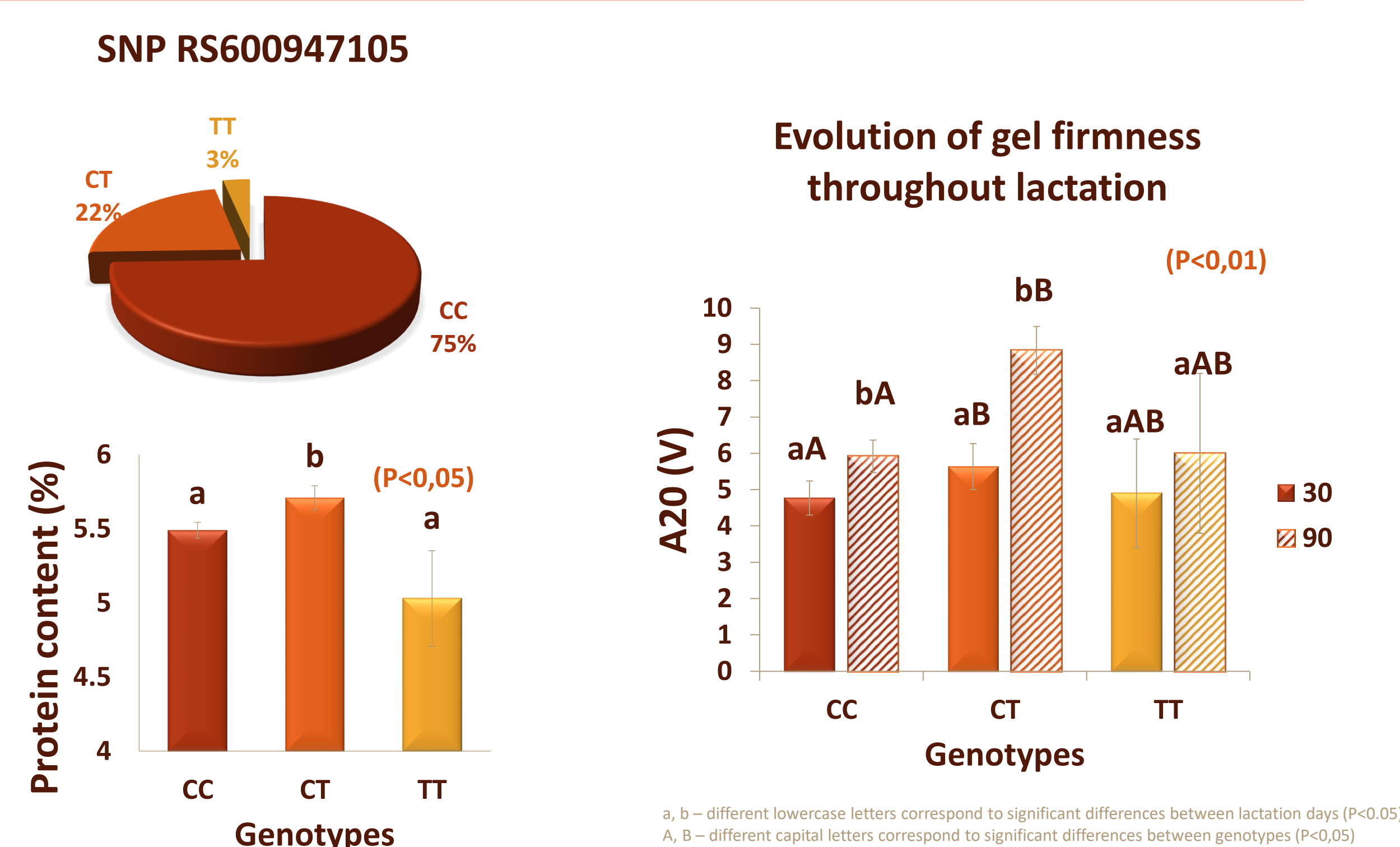✓ rs600947105 – CT + Protein content, and > gel firmness (A20 and AR)

Those SNPs might be used in MAS programs to improve Assaf ewes milk for cheese-making
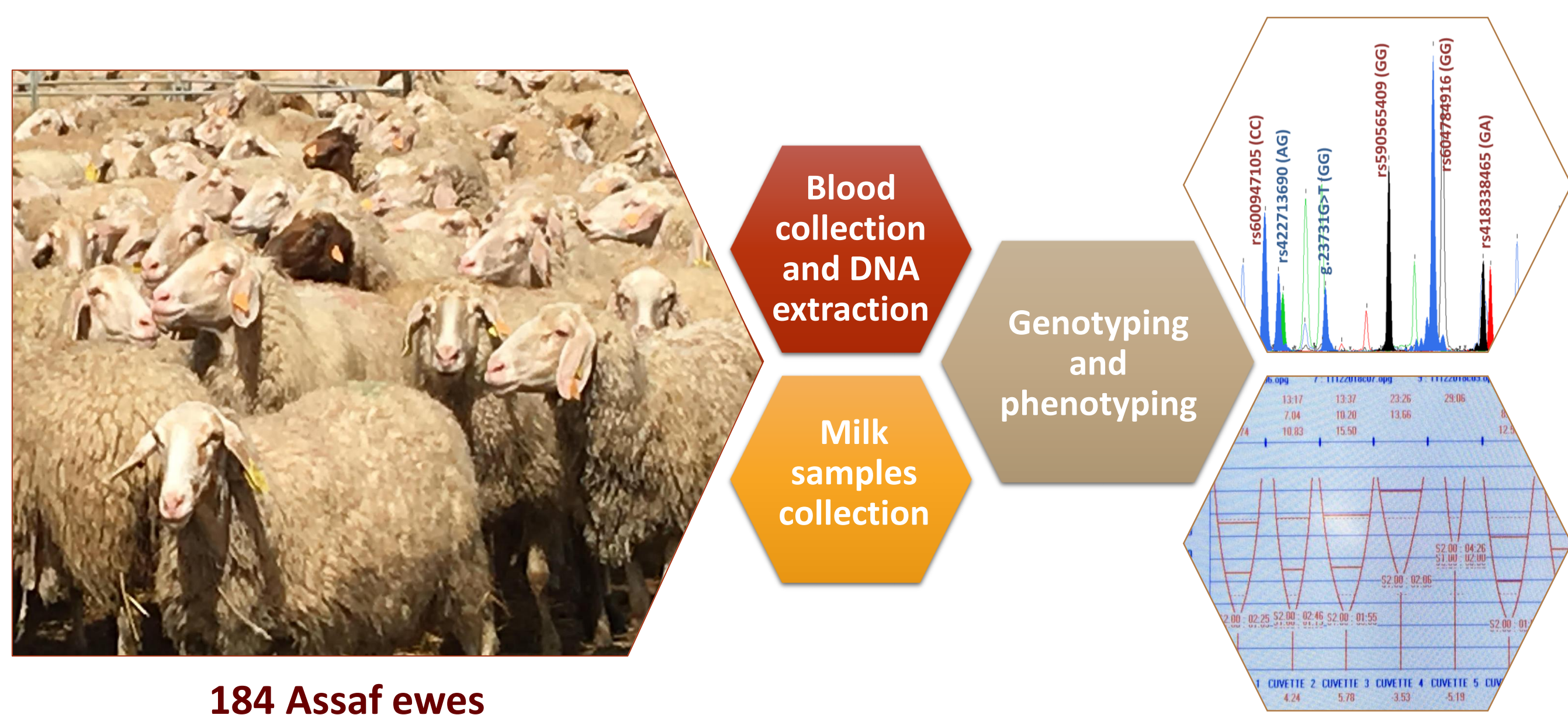
3 - Results

a) PRL gene SNPs affects fat free total solids % and clotting time

b) PRLR gene SNP affect Protein % and gel firmness (A20)

a, b – different lowercase letters correspond to significant differences between lactation days (P<0,05)
A, B – different capital letters correspond to significant differences between genotypes (P<0,05)

5 - Material and methods

184 Assaf ewes

a) Nine SNPs genotyped by SnapShot analysis

b) Milk composition analysis by Milk-o-Scan:
✓ Fat, protein, lactose, total solids and fat free total solids content

c) Coagulation properties evaluated at 30 and 90 days of lactation by Optigraph :
✓ Clotting time (R), gel firmness after 20 minutes (A20), and after a 2R (AR) period and rate of firming (OK20)

c) Statistical analysis
✓ Mixed model procedure to disclose associations between genotypes and phenotypes

*rosario.marques@iniav.pt