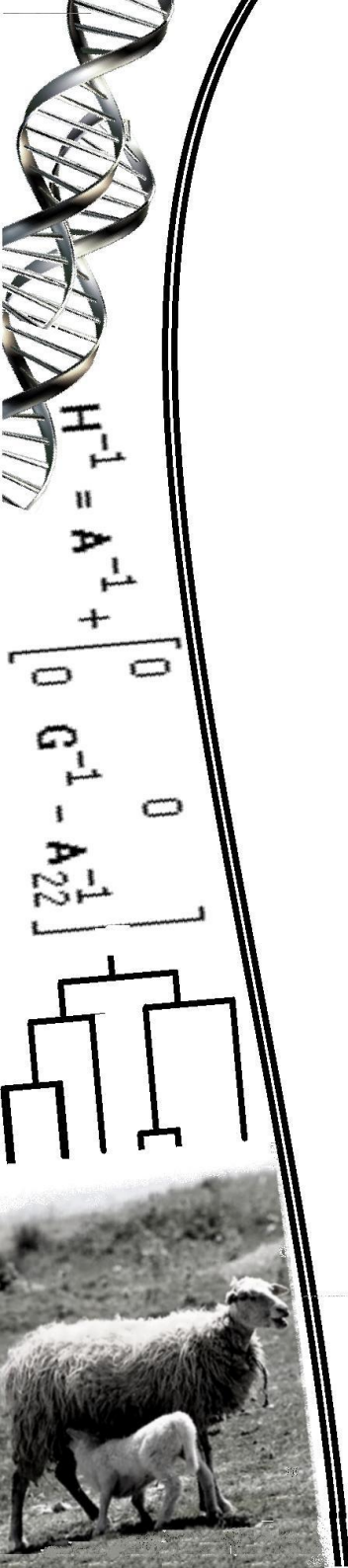# Genotype by environment interaction for length of first inter-lambing interval in sheep
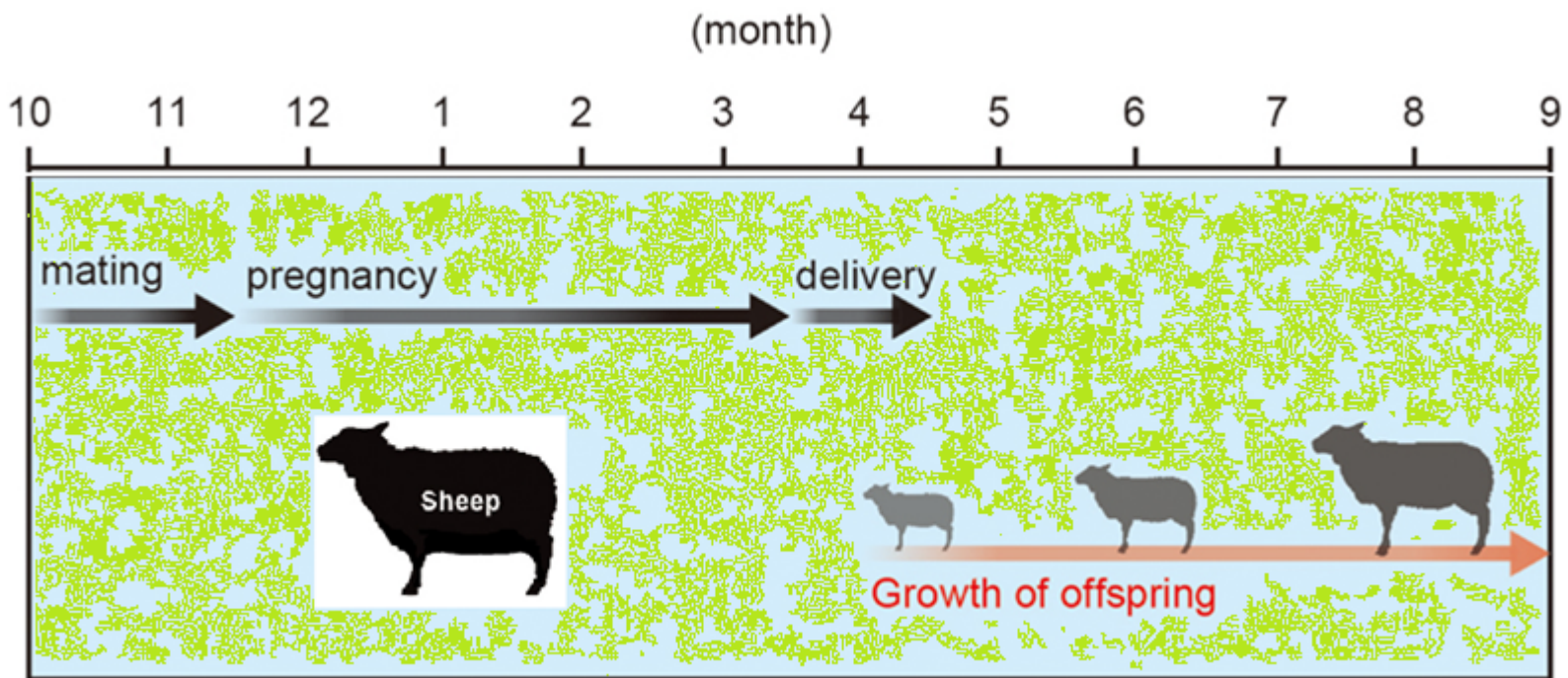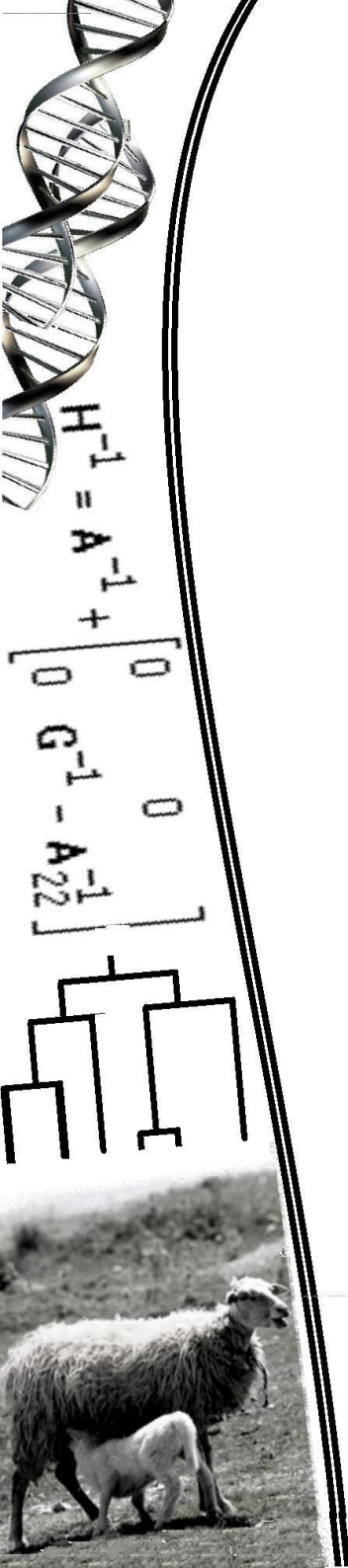
Ante Kasap, Boro Mioč & Valentino Držaić

University of Zagreb Faculty of Agriculture
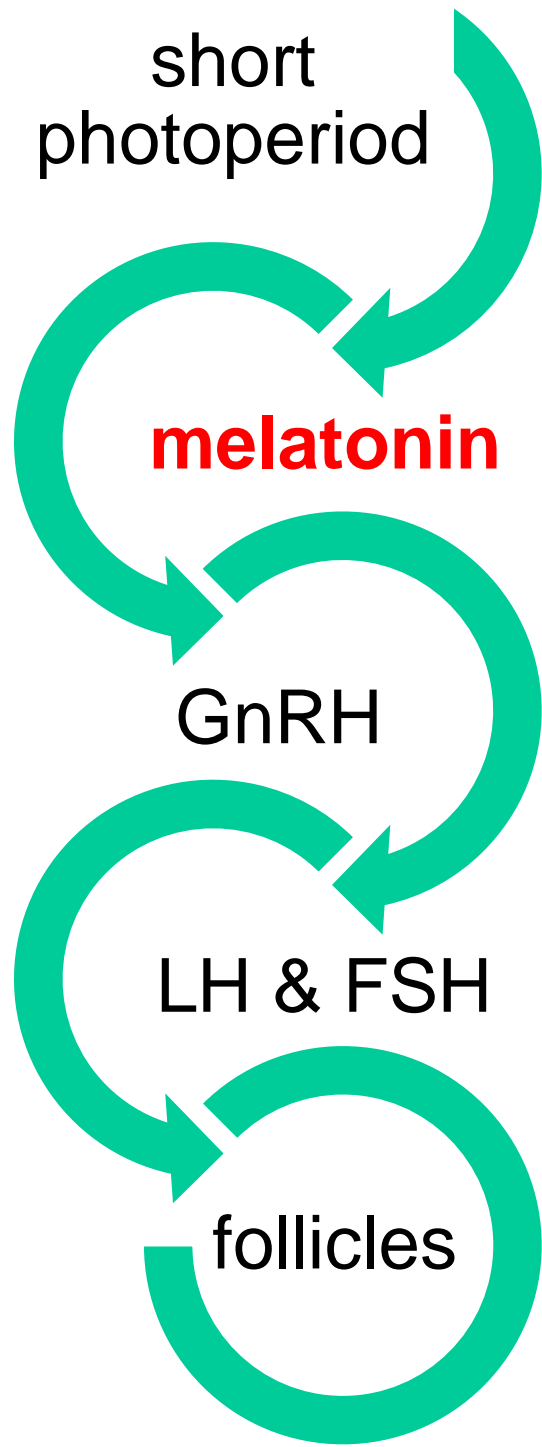*Department of Animal Science and Technology*

Dubrovnik, 30.08. 2018.
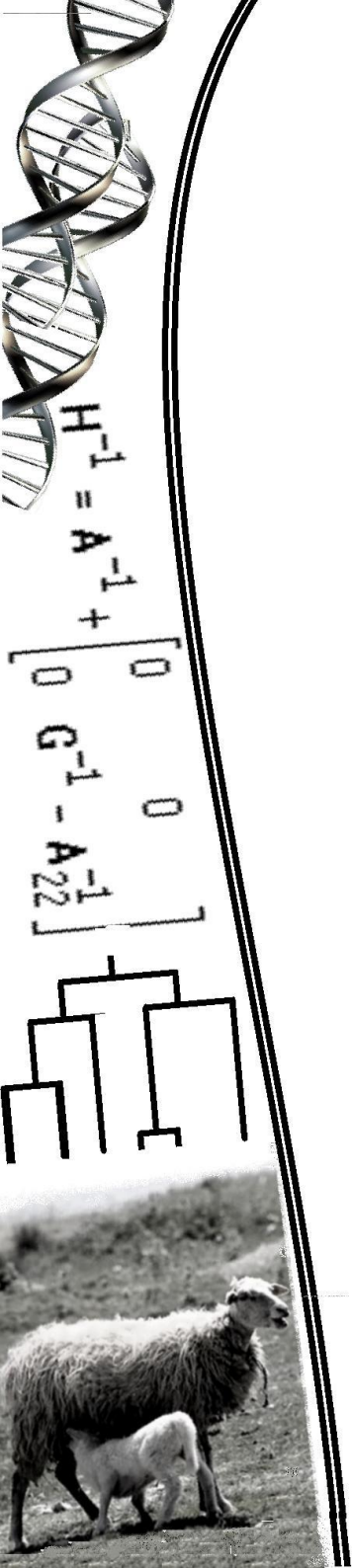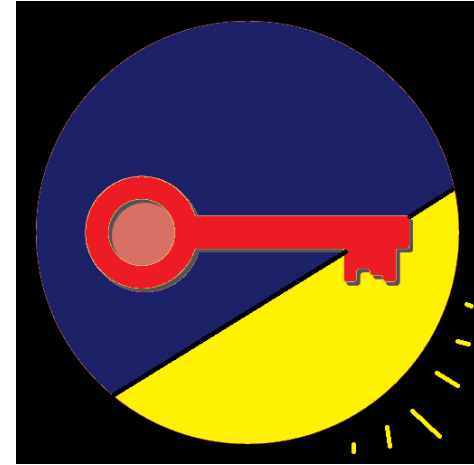
- SEASONALITY of estrus in (TCZ)

- Natural selection - food availability

- „Short-day breeders"

short
photoperiod
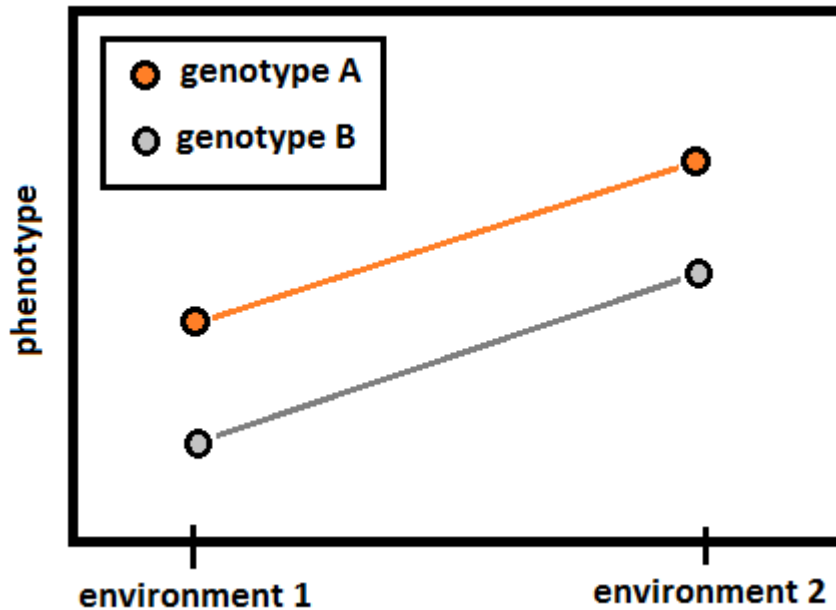
melatonin

GnRH

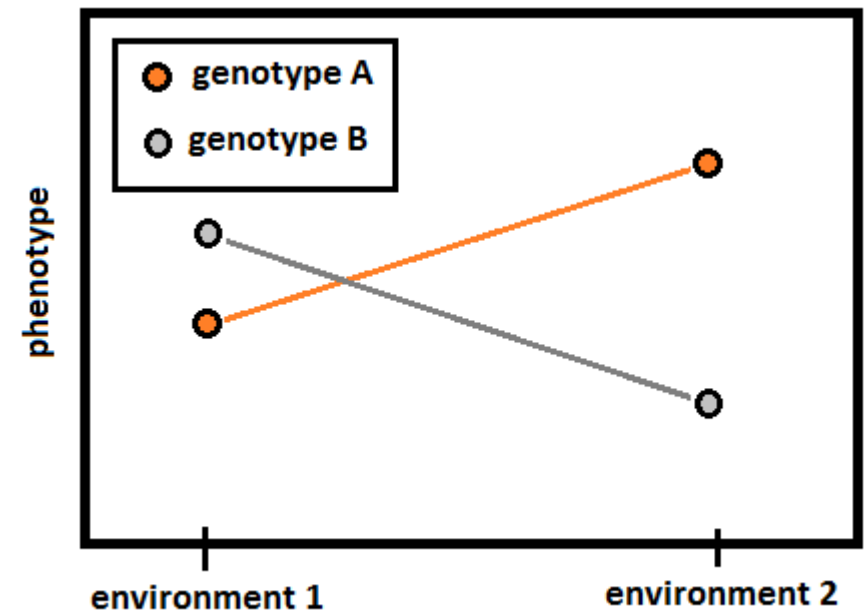LH & FSH

follicles

- Photoresponsivness

- MT1 G-protein receptor

- MTNR1A gene (26th chr.)

- 2nd exon

- 606 (CC, CT, TT)

- 612 (AA, AG, GG)
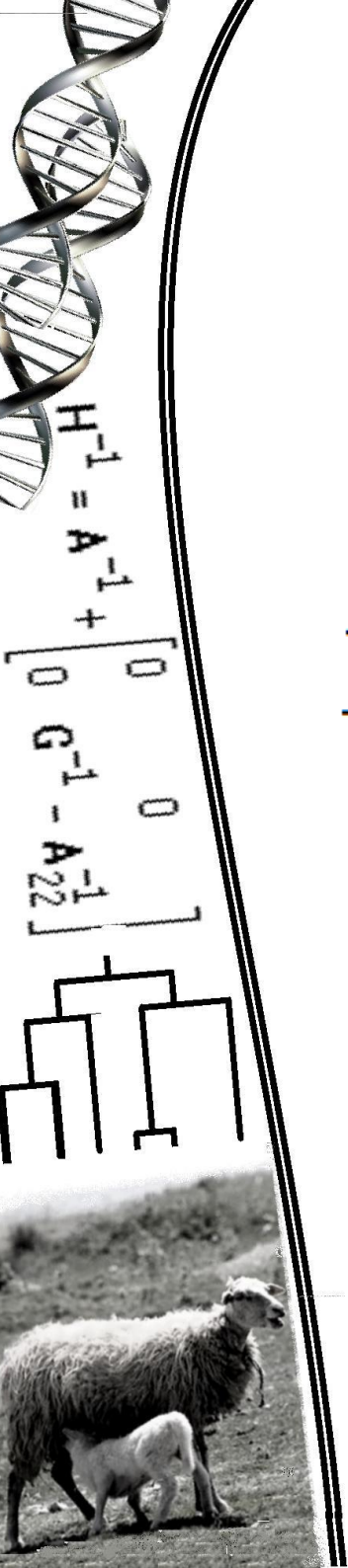
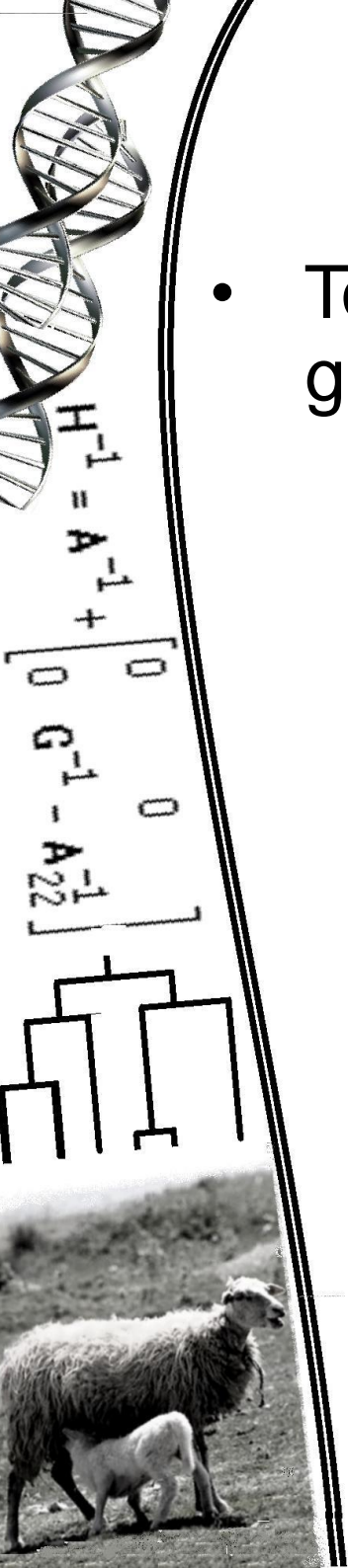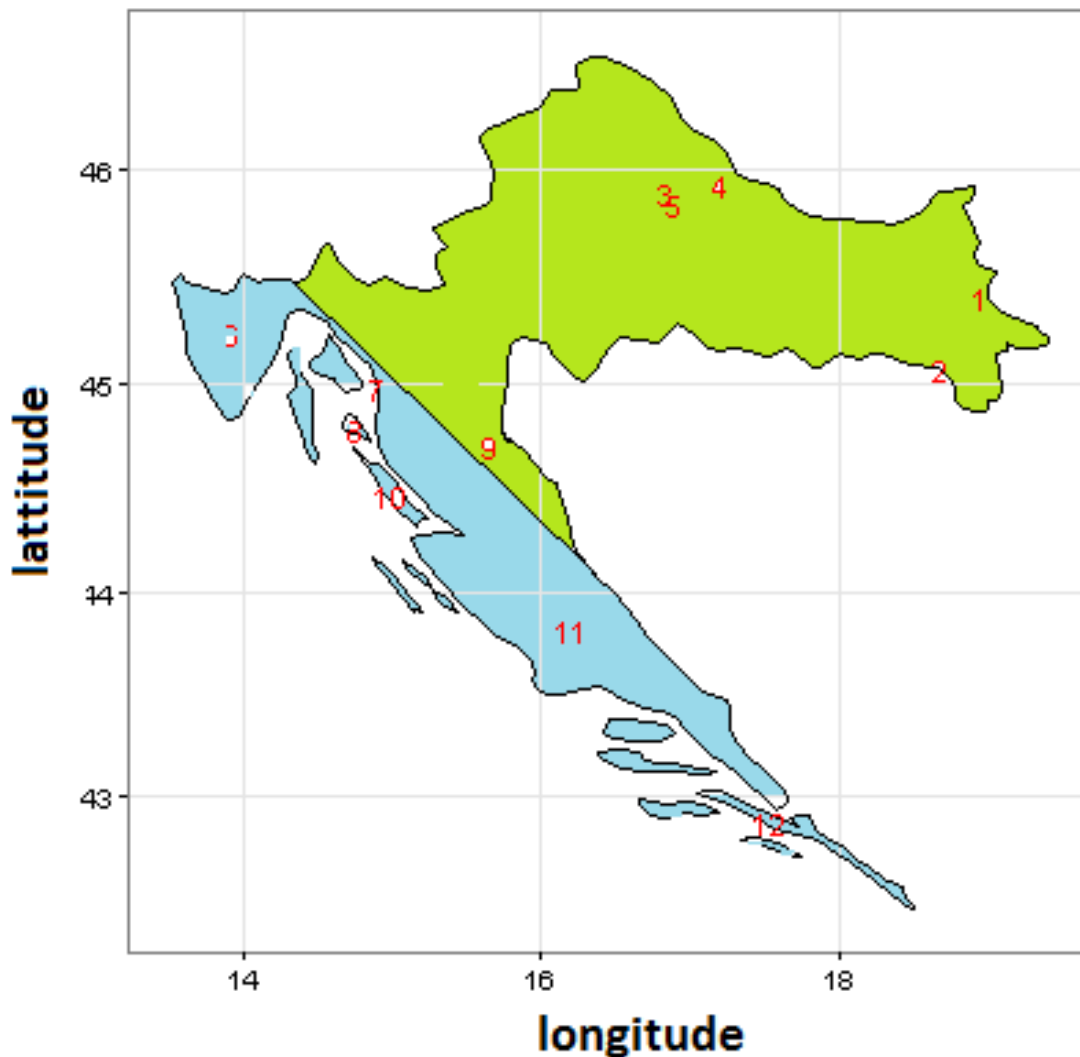- **Genotype by environment interaction**

- **Importance**

  - reduced response to „global" selection

  - inefficient importation of improved genotypes

Aim

- To determine phenotypic response of different genotypes (MTNR1A) in different environments (GEI)

Material and Methods

- 277 ewes (L, n=157, C, n=120)

- Phenotype (1st inter-lambing interval)

- Genotype   (MTNR1A – 606)

  PCR-RFLP (*Rsa1*)

- **Statistical analysis (ANCOVA)**

Genotype * environment interaction

Type of birth of ewes
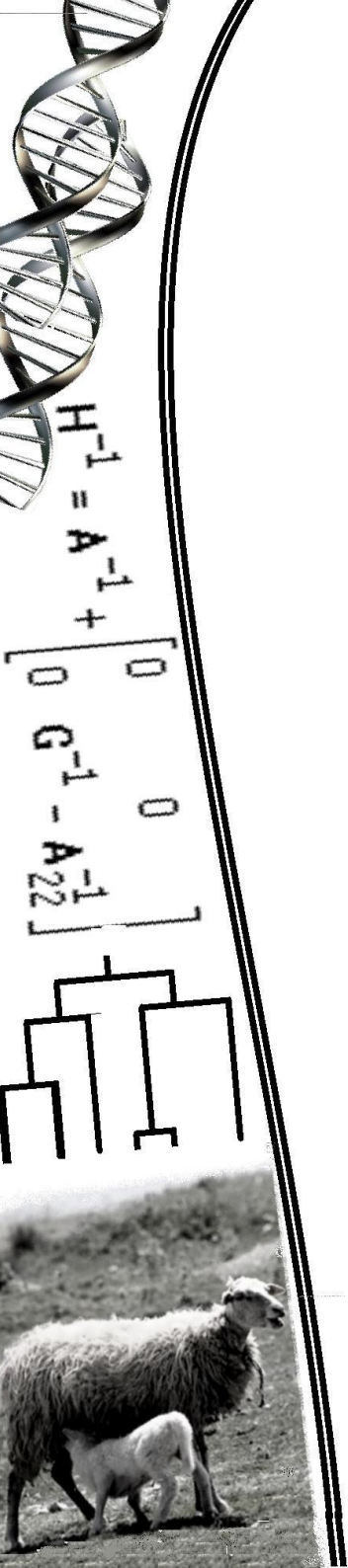
Season of lambing

Age at 1st lambing (covariate)

Results

Frequency of genotypes	CC	CT	TT
Littoral	0.15	0.55	0.30
Continental	0.26	0.49	0.25

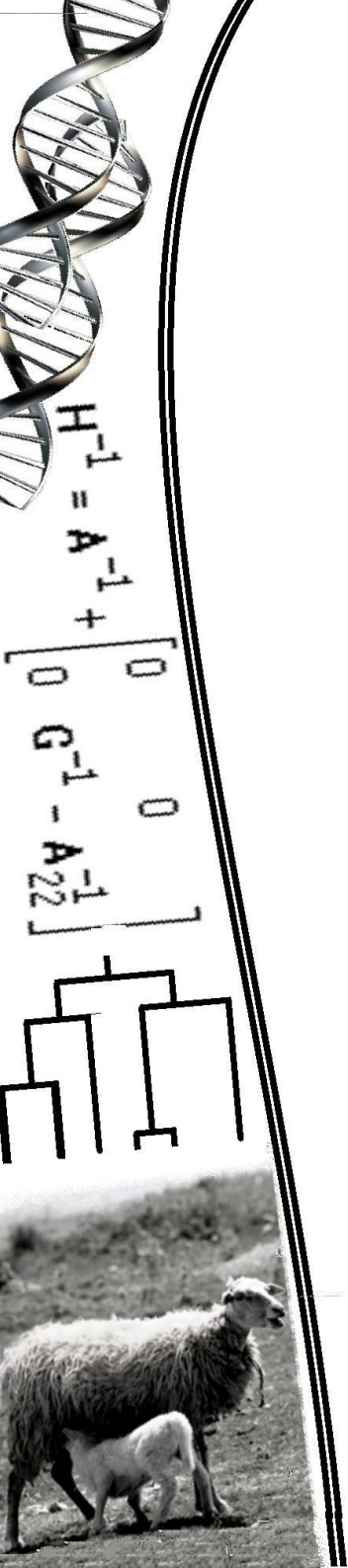| Length of 1st ILP (days)	CC	CT	TT
Littoral	331.9	355.4	371.3
Continental	363.5	370.7	365.7

- NO GEI ($F_{2,\,265} = 0.95$, $p = 0.39$)

Conclusions

- Selection on this gene should be effective regardless of environment

- The more extensive farming system, the more pronounced genetic effect

Thank you for your attention!