Session 10

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In sheep, the genetic correlation between female fertility after AI and milk yield is negative

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Motivations

- In cattle: Antagonistic relationship between female fertility and milk yield

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Regular decrease in fertility until inclusion in selection program

- In sheep: This genetic correlation has never been estimated

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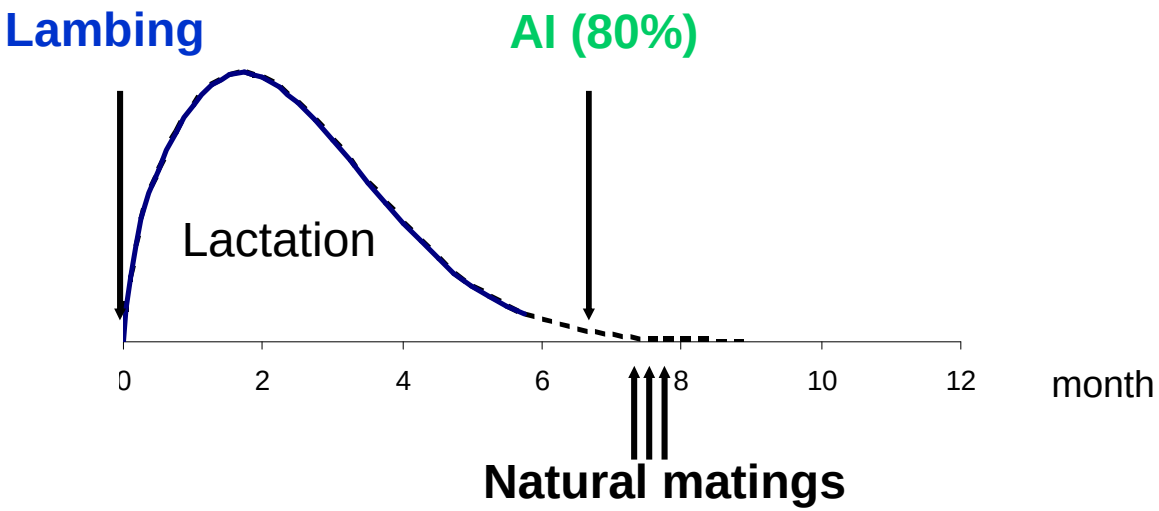
Our study

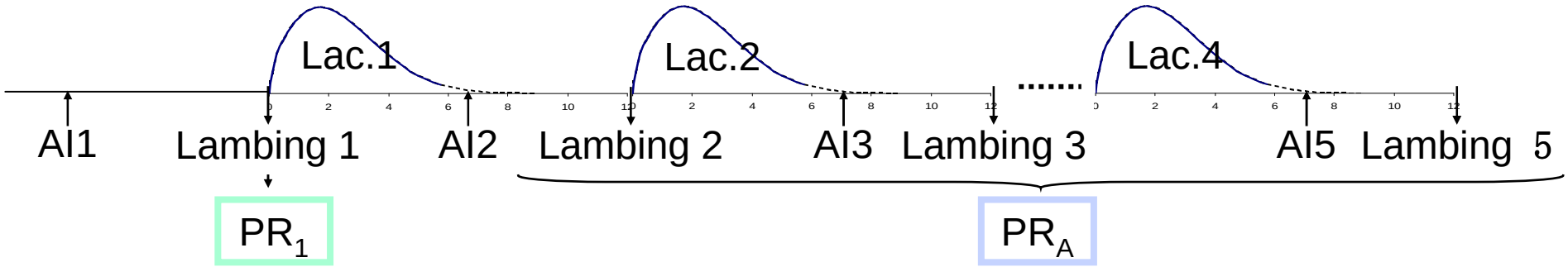
Lacaune breed

- Dairy Lacaune bred in the southwest of France
- Annual lambing system



Data

- National recording system
- Year : 2002 to 2006
- 416 670 lactation records / 189 101 ewes
- 3 traits
  - Standardised milk yield (SMY_T) 324L
  - Pregnancy rate in female lambs (PR_1) 81.3%
  - Pregnancy rate in adult ewes (PR_A) 68.3%



- Multiple trait linear sire model (ASReml)

Results: heritabilities

	PR_1	PR_A	SMY_T
PR_1	0.04 (0.004)		
PR_A		0.05 (0.004)	
SMY_T			0.27 (0.009)

Low heritability for fertility
medium heritability for milk yield

Results: phenotypic correlations

	PR_1	PR_A	SMY_T
PR_1	0.04 (0.004)		
PR_A	0.03	0.05 (0.004)	
SMY_T	0.03	-0.05	0.27 (0.009)

Low phenotypic correlations

Results: correlation between permanent environmental effects

	PR_1	PR_A	SMY_T
PR_1	0.04 (0.004)		
PR_A	0.03	0.05 (0.004)	-0.15 (0.009)
SMY_T	0.03	-0.05	0.27 (0.009)

negative correlation

Results: genetic correlations

	PR_1	PR_A	SMY_T
PR_1	0.04 (0.004)	0.55 (0.05)	-0.06 (0.05)
PR_A	0.03	0.05 (0.004)	**-0.23** (0.04)
SMY_T	0.03	-0.05	0.27 (0.009)

Antagonistic correlation
between female fertility and milk yield in adult ewes

Discussion

- What should be the consequences of this negative correlation ?
  - Lacaune sheep intensively selected for milk production for more than 20 years

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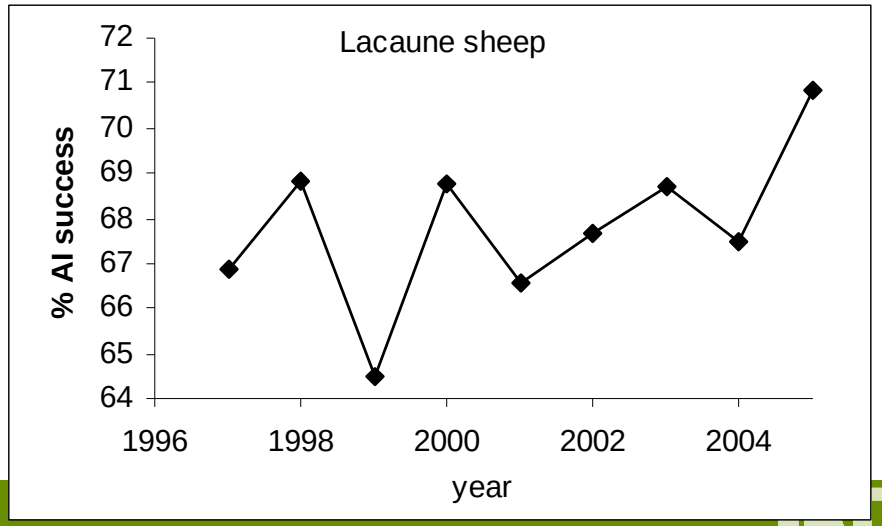
fertility results should decrease
(as in cattle)

No phenotypic decrease



Discussion

- Why is there no phenotypic decrease?
  - False result ?
    - 5% of chance to make the wrong decision
  - Regular improvement of environmental conditions
    - Improve semen evaluation
    - Improve criteria to choose the females to inseminate
    - Improve female synchronization, inseminator evaluation
  - Selection for fertility:

    More selection of the ewes to artificially inseminate according to the previous reproduction result
    - Increase the average probability of success
    - Induce genetic selection

Conclusion

- First estimation of the genetic correlation between AI fertility and milk yield in sheep
  - Negative correlation
  - No phenotypic decrease
  - Confirm the antagonistic relationship