



INRA



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Integrating feeding and reproductive management of dairy goats : a modelling approach to assess herd performance

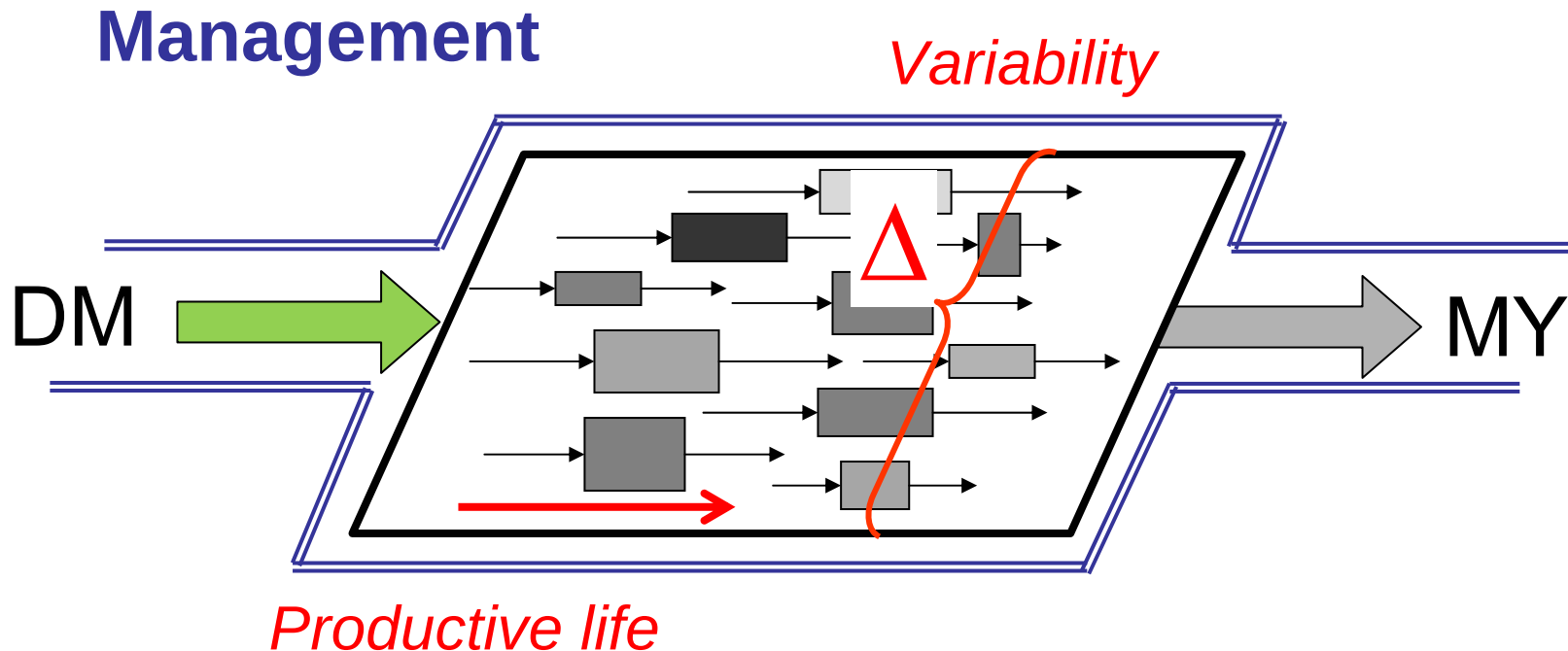
L. Puillet – O. Martin – D. Sauvant – M. Tichit

60th EAAP Congress – Barcelona 24-27 August 2009



Rationale

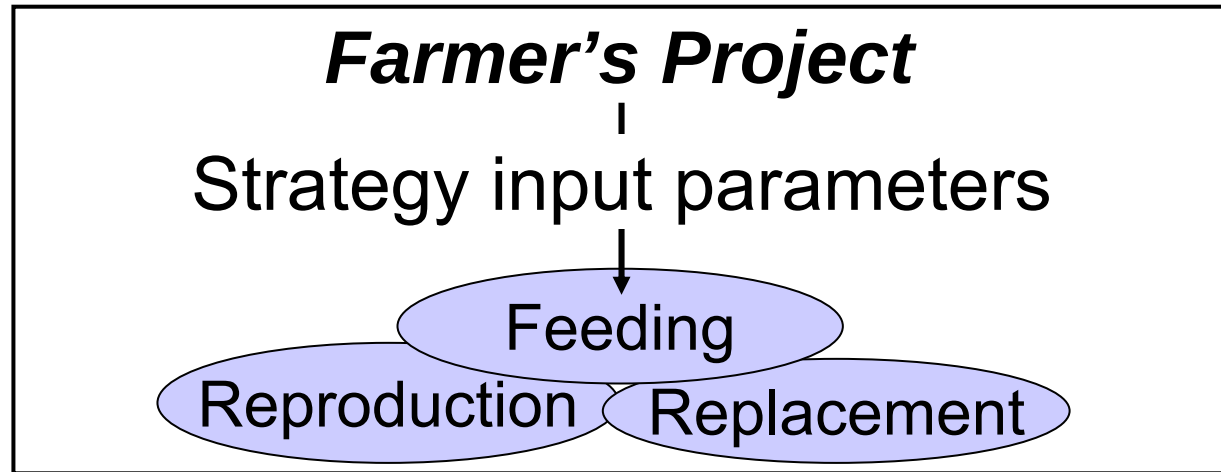
→ Increasing need to find **compromise** between **production level** and **herd efficiency**



→ A model integrating **management** x **individual variability**

Model presentation

Decisional system

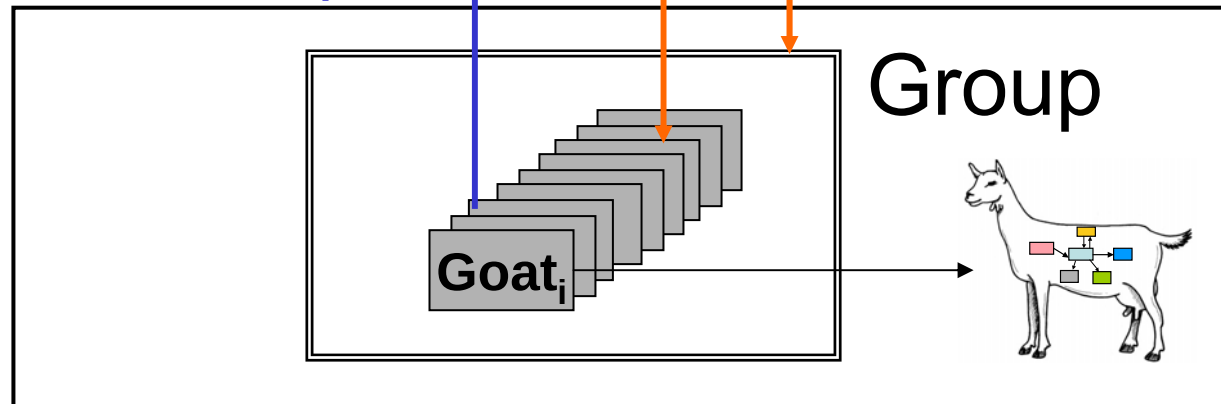


IF *[condition true]* **THEN** *[action]*

MY, lactation number, physio. state

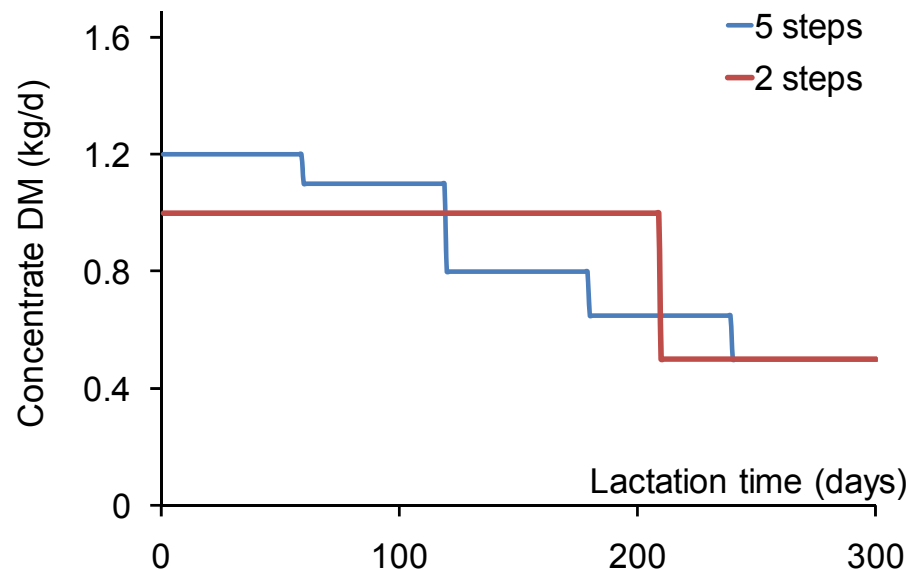
Diet change, culling, mating

Biological system



Simulation method

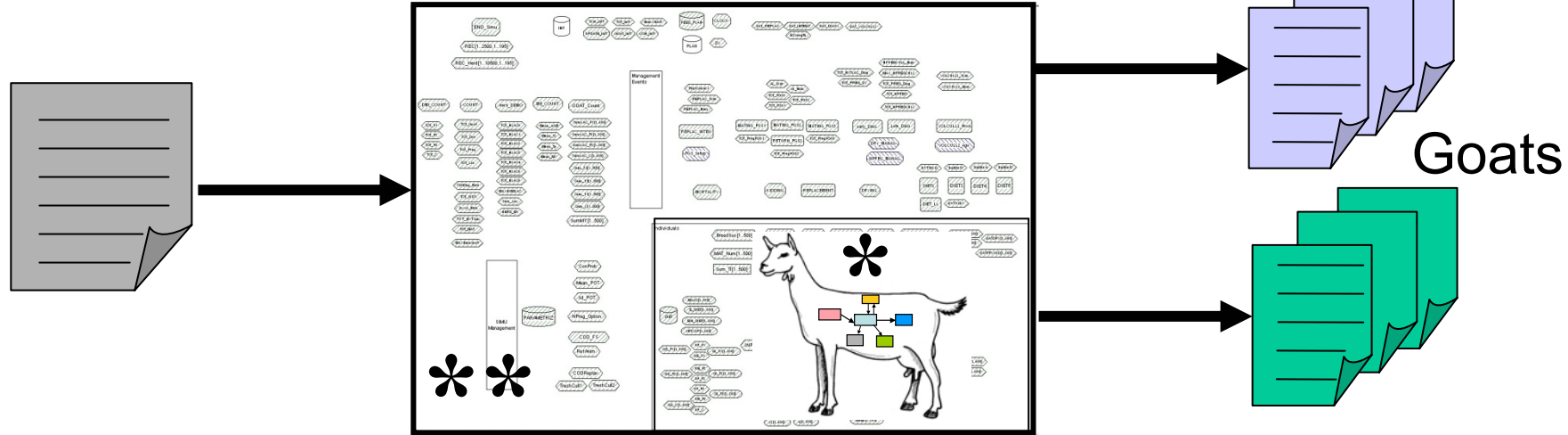
- 2 x 2 factorial design:
 - Reproductive management strategies
condensed vs spread mating
 - Feeding management strategies
2-step vs 5-step feeding sequences



- Herd (300 goats + 90 does) mated in season

Simulation method

Virtual herd



Genetic potential

Management
parameters

20 years simulated

10 years analyzed

15 replications

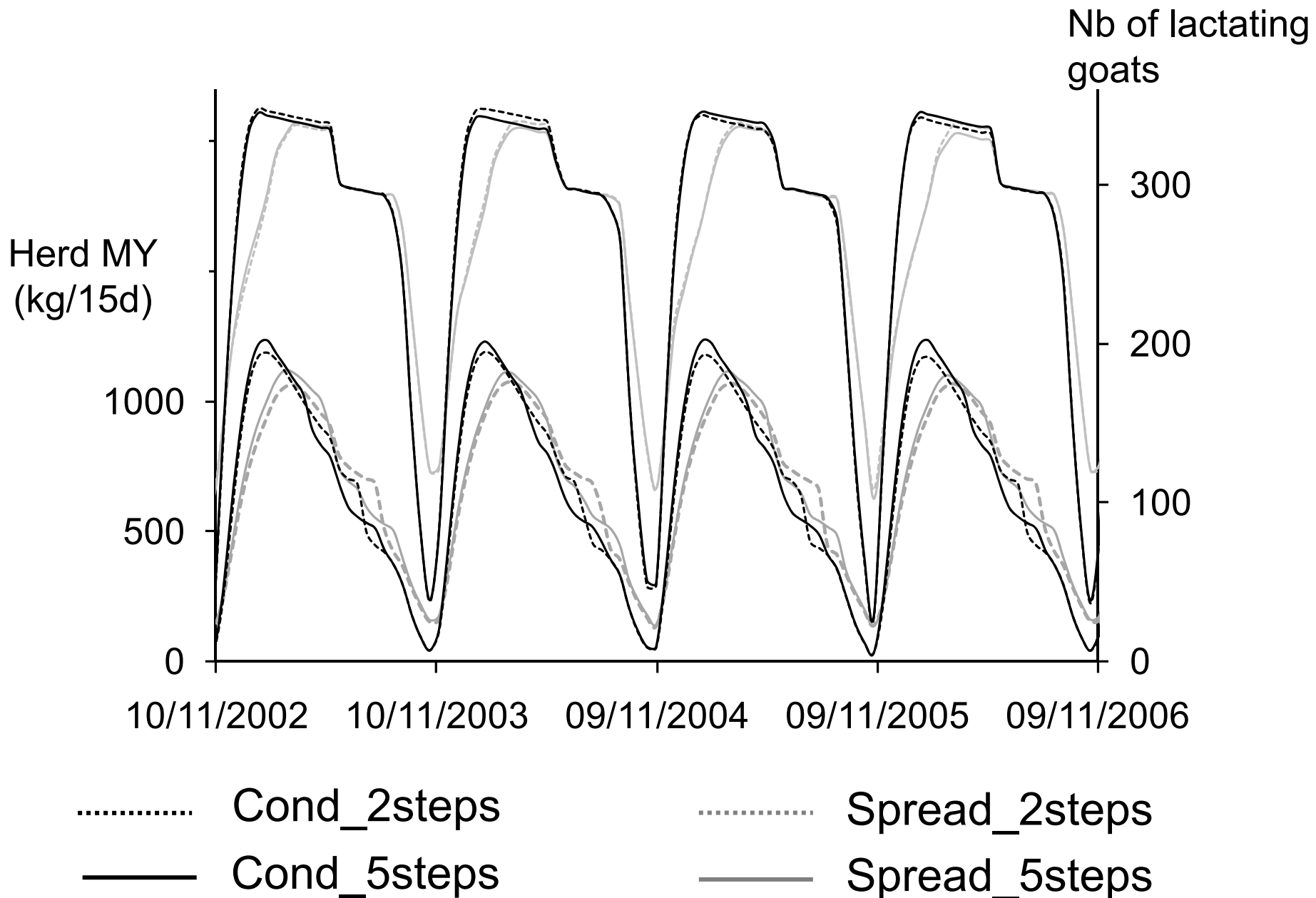
* Puillet et al., 2008. Simple representation of physiological regulations in a model of lactating female: application to the dairy goat. Animal 2, 235-246

** Puillet et al., An individual based model to simulate individual variability and herd performance in the long term, in preparation

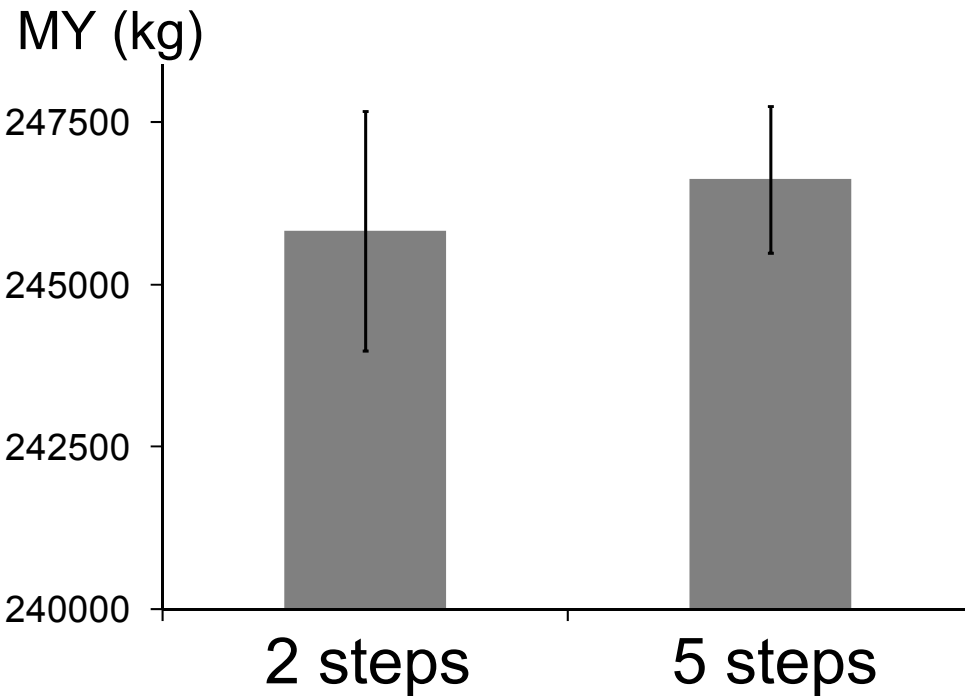
Results

- (1) Overview
- Focus on condensed mating
 - (2) Herd
 - (3) Productive life
 - (4) Individual variation in BW

(1) Overview



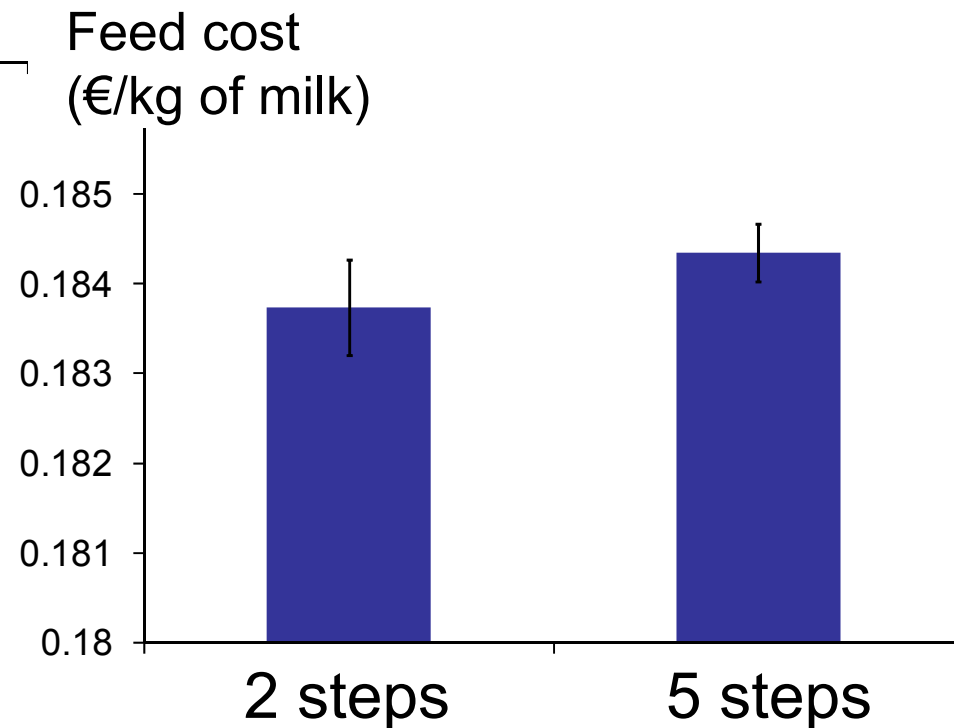
(2) Herd



↑ number of steps
→ Slight production level ↑

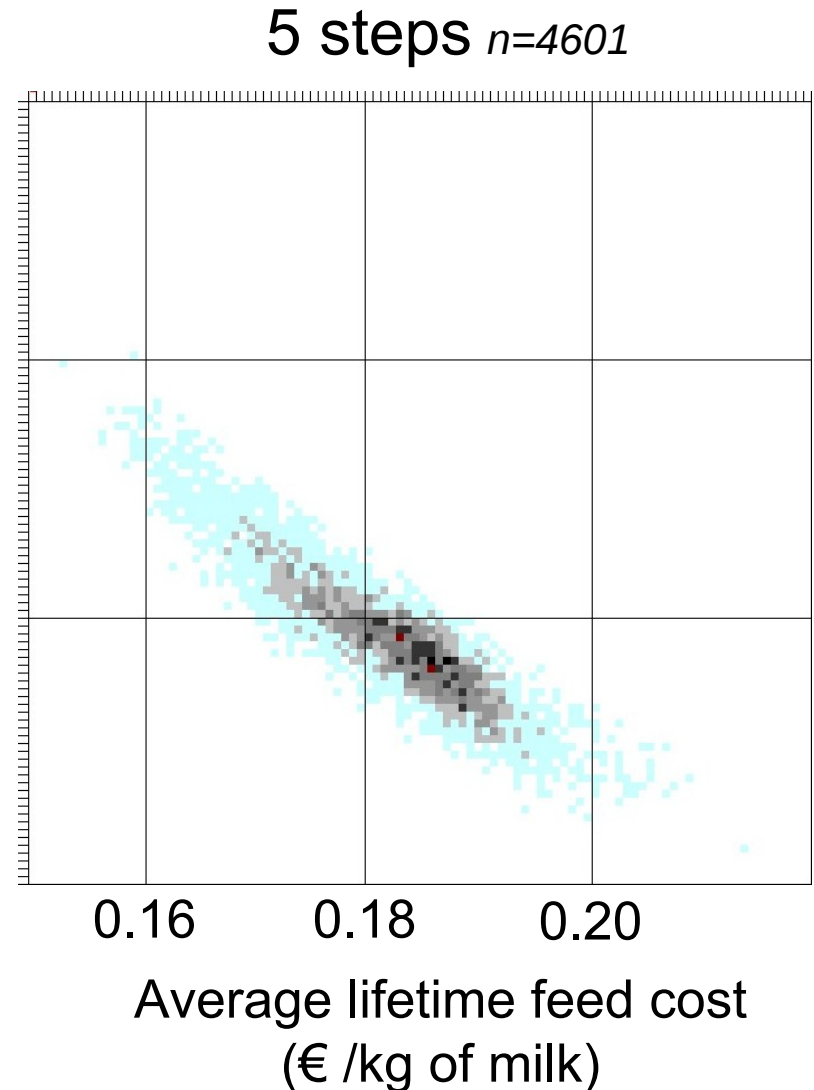
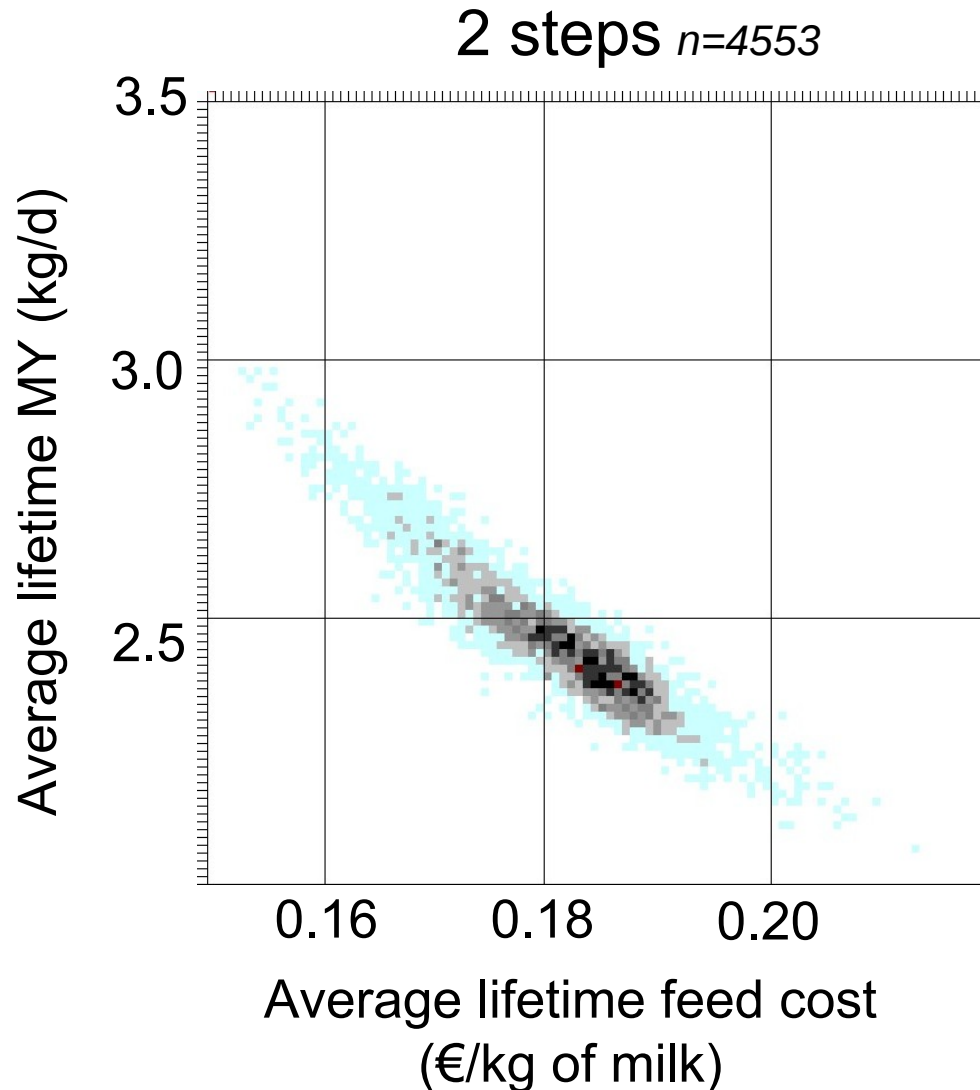
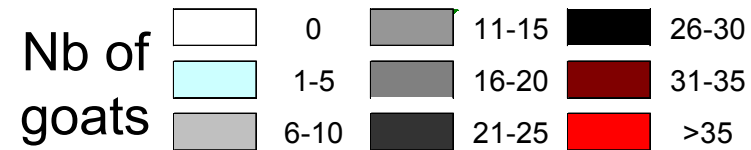
But ↑ number of steps
→ Slight production cost ↑

Efficiency ↓



(3) Productive life

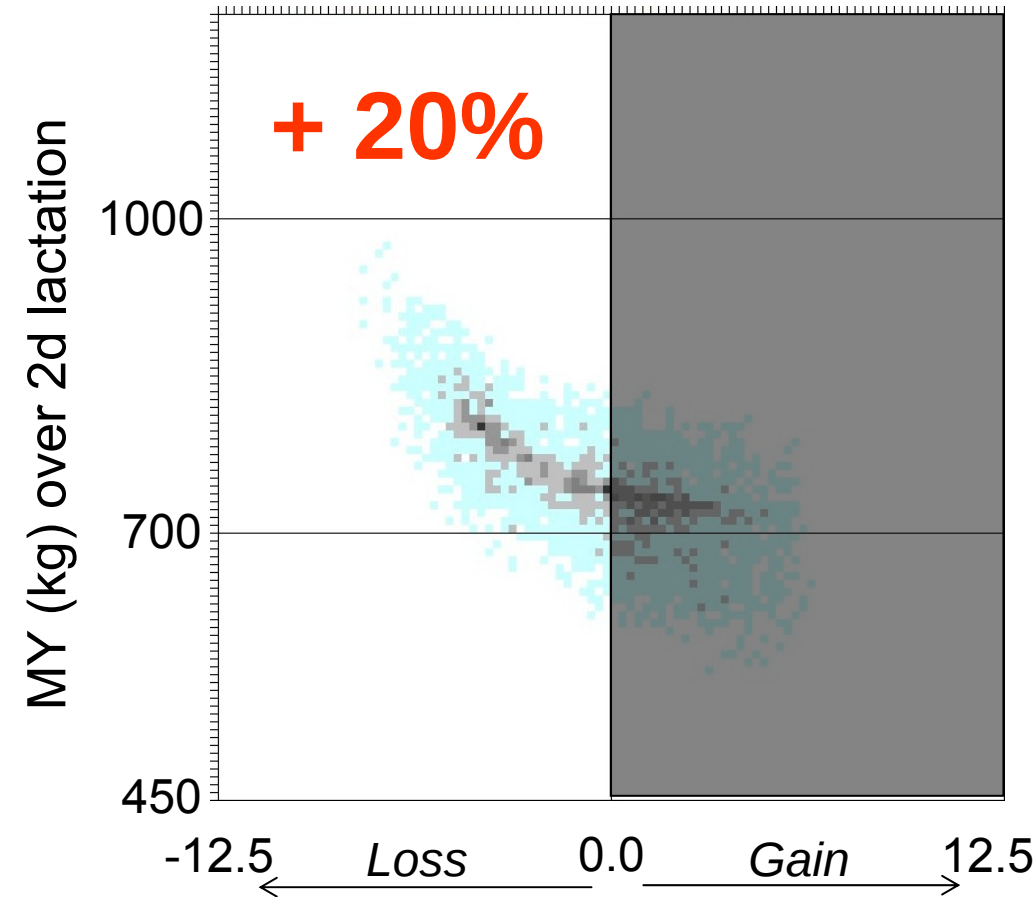
Where are the goats?



(4) Individual variation in BW

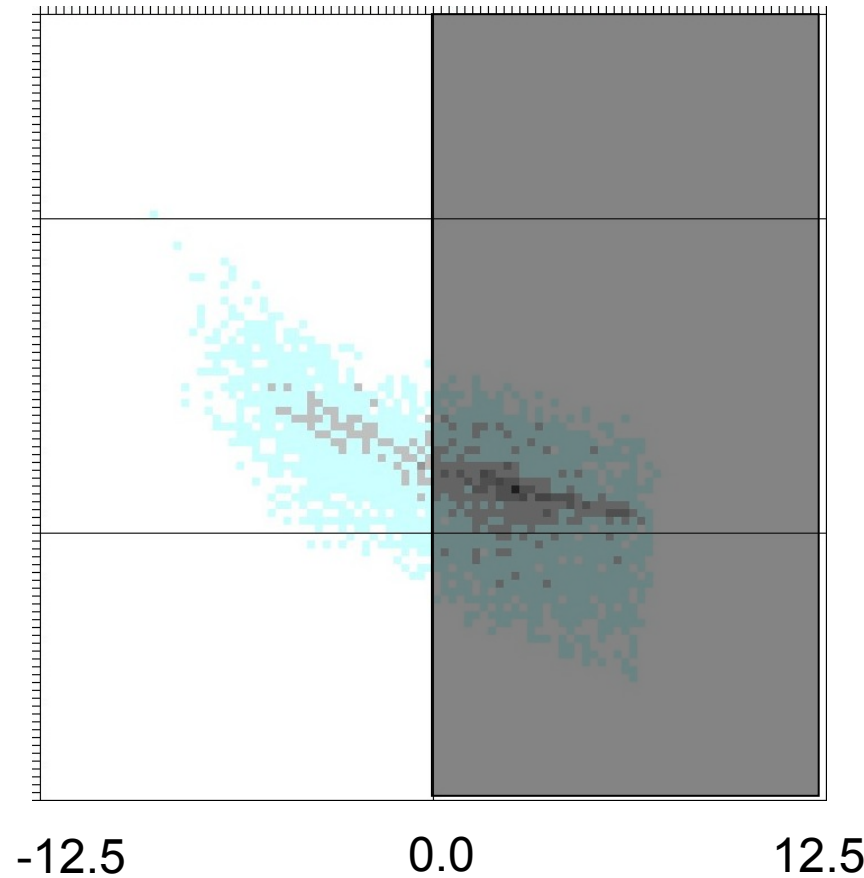


2 steps $n=4084$



BW difference (kg) actual-potential
at 90d of 2d lactation

5 steps $n=4128$



BW difference (kg) actual-potential
at 90d of 2d lactation

Conclusion

❑ Feeding sequences $\rightarrow \approx$ effect at herd and productive life levels

❑ Efficiency

$\rightarrow \neq$ biological processes

$\rightarrow$ 2 steps sequence =

$\uparrow$ % individuals losing BW

Indiv. variability $\rightarrow$ $\underbrace{\text{biological buffering abilities}}_{\text{LFS adaptability}}$

Perspective

- ❑ Model → investigation tool
- ❑ Management effect on individual variability
 - Feeding level and genetic potential
 - Management simplification linked to labor constraint in large herds

Acknowledgment

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