UMR1213 Herbivores

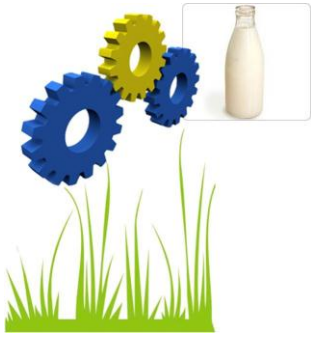
Biotechnics farming systemsTeam (SYBEL)

Dynamilk, a simulator to turn grass into milk

Dynamilk is a simulator to study the tradeoffs between animal performance, use of grazing resources and search for food self-sufficiency in dairy cattle mountain systems. Dynamilk also allows conducing in silico experiments to test the effects of climate aleas on the performance of cattle from few weeks to several years.

The competitiveness of grassland dairy systems and their ability to cope with climatic conditions or changes in production constraints rely a lot on food and feed autonomy. A better match between the dynamic needs of the animals and grassland resources would allow these systems achieving greater autonomy. To explore contrasting strategies and understand the trade-offs that can be achieved between production, forage autonomy and use of grasslands, we built Dynamilk, a deterministic simulation model of the whole farm.

The impacts of reducing the amount of concentrates in cows diet, of increasing stocking density, and of a 17-year climate fluctuations with several aleas were simulated for two production systems where calving are grouped either in autumn-winter or in late winter-spring. At low stocking density, the two systems perform similarly however, the system where cows calve in late winter-spring is less sensitive to climatic hazards. Furthermore, system performance is improved by increasing the stocking density thanks to a better use of the grass available. Finally, reducing the amount of concentrates in cows diet induces only a small decrease in milk production because the grass is then better valued.



Dynamilk was also used to explore the potential effects of a change in the specifications of the PDO Saint Nectaire cheese sector. In the future, other changes will be simulated and analysed and Dynamilk will be used to design and develop innovative farming systems.

Publication/patent

Jacquot AL., Baumont R., Delaby L., Pomies D., Brunschwig G., 2013. Dynamic model of milk production responses to grass based diet variations during wintering and grazing. Journal of Agricultural Science. In revision

Communications aux colloques « International Farming System Association » 2012, Journées Rencontres Recherches Ruminants 2012 et 2013 et au congrès de l'European Association of Animal Production 2013.

Demonstration of Dynamilk to the network for advice and development of farming.

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