

➤ Use of grazing with dairy goats to design sustainable food systems

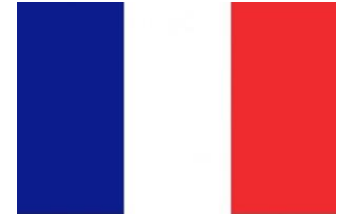


H. Caillat, E. Bruneteau, B. Ranger

INRAE Experimental unit Forage, Ruminants, Environment of Lusignan



FRANCE: the country of goat's milk

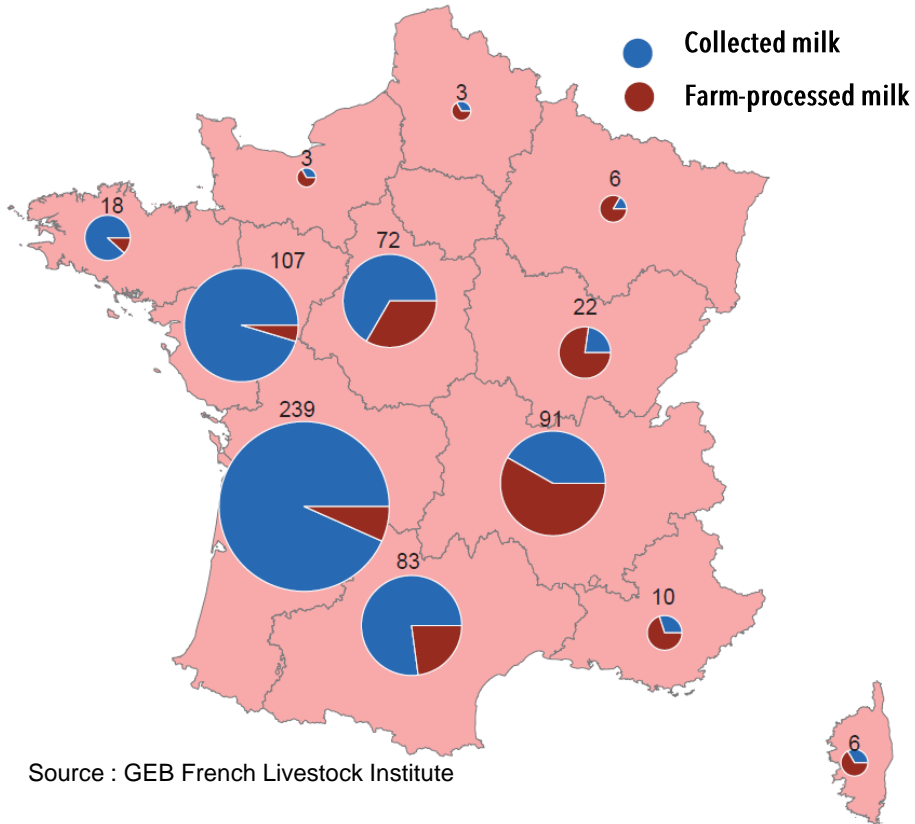


1st EU producer: 660 millions liters collected

4th flock: 1.3 million of dairy goats



1^{er} world producer of pure goat cheese



Source : GEB French Livestock Institute

Carte réalisée avec Cartes & Données - © Artique



76% milk delivered to dairy factories

60 dairy factories (international companies or small and medium-sized businesses)

6 000 goat farmers



47% On-farm processors

48% Deliverers



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The challenge of greater sustainability



61% feed self-sufficiency



44% protein feed self-sufficiency



Low feed self-sufficiency : hay-based diets but a lot of concentrates (~500 kg.goat⁻¹.year⁻¹)



High net emissions of CO₂ for dairy goat systems

1.42 kg net emission of CO₂ / L of milk

Vs

< 1 kg / L of milk in dairy cows farming systems



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Gap between reality and the image of goat production as perceived by consumers

Today, only 5% of goats graze in the main region of production!!!



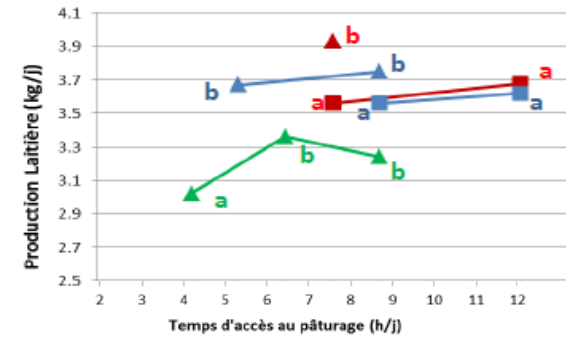
A greater use of grazing can be a solution: why?

Goats are **highly efficient grazers** of multi-specific grasslands in the West of France context: DMI = 5% of BW with 30% of concentrates and 70% of grazing!

- Dairy goats have **higher intake** (in % of BW), speedier and longer than cows
- They have **high ability to adapt their grazing behaviour to change of grazing management practices**, equal or higher than cows (pasture allowance, access time, no water during grazing, first time grazers,...).



Does grazing improve multiple performances at the scale of the farm?



Caillat et al., 2018; 3R
Charpentier et al. 2019; Livestock Sci & Animal
Delagarde et al., 2021 INRAE Prod. animales



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A system-experimentation to answer this question: Patuchev *(since 2013)*

2 grazing systems which differ by the kidding period (February or September)

- **Low inputs systems** & a forage system based on **cultivated multi-specific grasslands**
 - ➔ mixed crop-livestock systems
 - ➔ 0 mineral nitrogen (*only by legumes and compost*)
 - ➔ 0 pesticide
- Data monitoring to compute sustainable indicators
- A grazing-based and low inputs dairy goat farm can up the **challenge of feed self-sufficiency in limiting resources use** and get high dairy performances.

Key figures

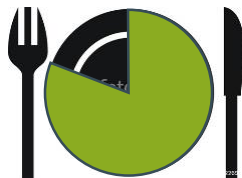
2 x 10 ha of total area

2 x 60 dairy goats of French Alpine breed

1 Hay dryer of 160 T with solar collector



*Kocken et al. 2020; 3R
Caillat et al., 2021; Opt. méditerranéennes*



81.7% feed self-sufficiency



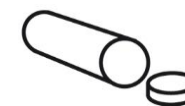
141 days of grazing per year
(~30% of Total DMI)



282 kg DM



784 L.year¹



FC : 38.5 g.L⁻¹

PC : 34.0 g.L⁻¹

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Results from 2020-2022 period



A high nutritional value milk and a low feed-food competition

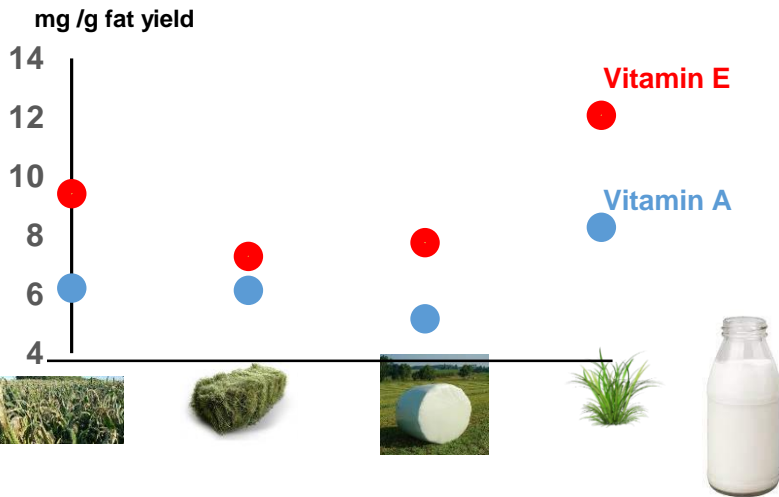
Grass intake improves the nutritional quality of goat milk



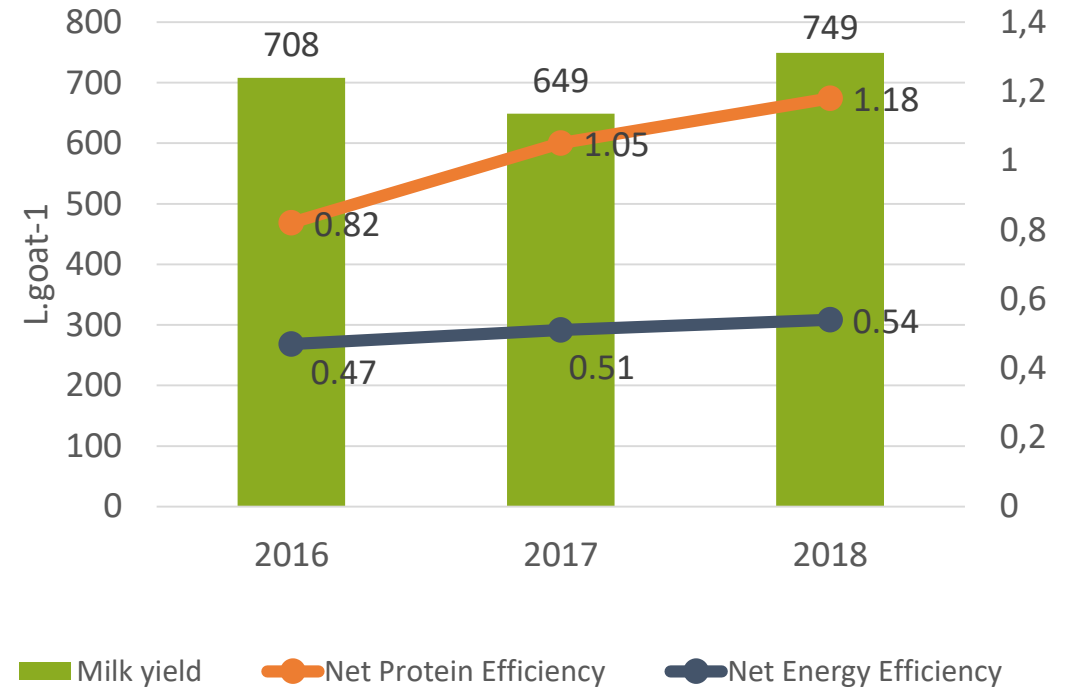
- + vitamins A & E
- - saturated fatty acids
- + insaturated fatty acids (omega 3)

Grass intake improves levels of compounds affecting sensory quality

Laurent et al., 2019; EAAP
 Gaborit et al.; 2020; PSDR Fleche project
 Laurent et al., 2023; Animal



A grazing-based system is a net consumer of energy but a net producer of proteins



Caillat et al., 2022; FAO-CIHEAM



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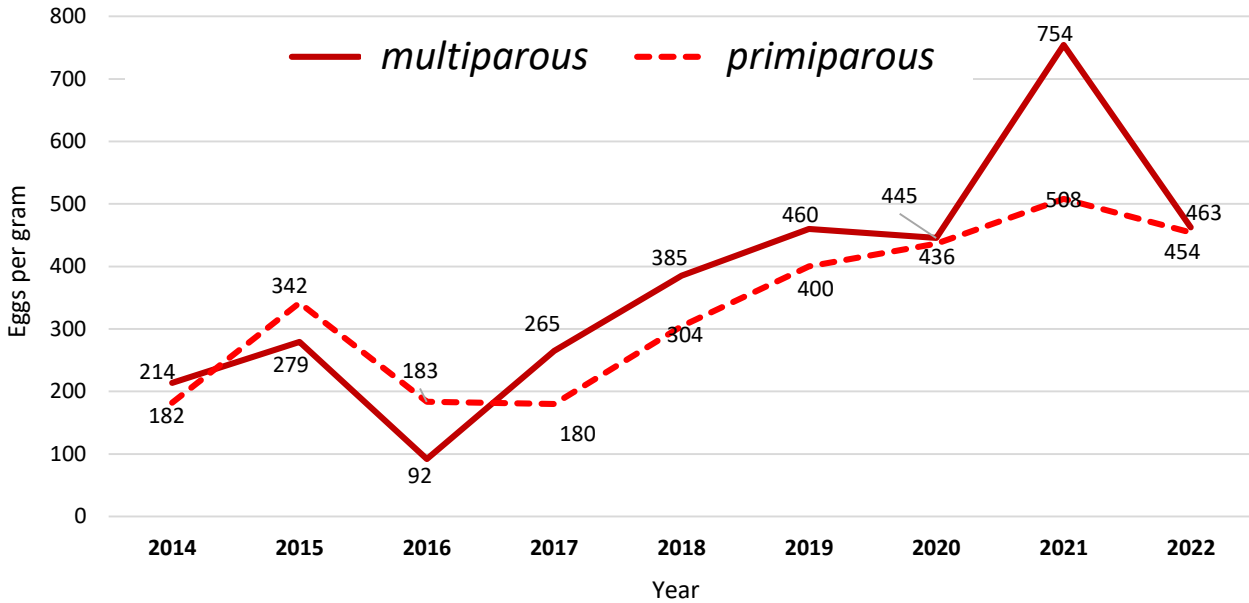


Welcome to the EAAP + WAAP + Interbull
Congress 2023
 Lyon, France - August 26th / September 1st, 2023

A good image with grazing but an essential vigilance on health and welfare

A continue increase of the annual excretion of strongyles

➔ +24.8% per year since 10 years!!!



Study since 2014 with monthly analyzes of groups



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Conclusion

Dairy goats with grazing-based diets can contribute to design sustainable food systems.

With a large use of grazing, it's possible to get :

- **high dairy performances** while limiting the use of resources
- **high nutritional quality & sensory quality** of goat milk and goat cheese
- **practices respecting the consumers wishes and animal welfare**



However, the success conditions are linked

- Produce **high quality grasslands rich in legumes** (*Jost et al., 2021 & Caillat et al., 2022 ; Innov agronomiques*)
- Develop an **agroecological management of gastro-intestinal parasitism** (*Hoste et al., 2012; INRAE productions anim.*)
- Develop a **better use goat products** like the goat meat to more limit feed-food competition whose consumption is still limited in France (*Pomiès et al., 2023 ; INRAE productions anim.*)

Dairy goats have highly adaptable capacities
They can add value to diversity of resources

They can play a vital role in different countries, offering a unique alternative for sustainable agriculture.



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Thanks to the experimental staff of Patuchev device & R. Delagarde J. Jost L. Puillet



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<https://ferlus.isc.inrae.fr/dispositifs-experimentaux/patuchev>

