ENVIRONMENT

RUMINANT LIVESTOCK FARMING AND BIODIVERSITY

UNDERSTANDING & EXPLAINING THE SERVICES PROVIDED BY LIVESTOCK FARMING

« How do livestock farming practices and systems contribute to biodiversity? »

1

Grassland maintained by livestock at landscape level play a key role in biodiversity.

They are home to many wild species, a source of significant diversity of flora and fauna. Maintaining them prevents overgrowth, which is synonymous with a loss of biodiversity.

2

At landscape level, agro-ecological infrastructures play a key role in preserving biodiversity.

These are areas of refuge, hunting and travel for many species.

3

Livestock farming helps to maintain diverse landscapes, crucial for biodiversity.

4

The vast majority of feed for herbivores is produced on farm.

Improving protein autonomy is at the heart of industry's concerns.

5

Farming practices are key to preserving biodiversity.

Good mowing, grazing, fertilisation and crop diversity practices are favourable to plant and animal species.

6

The diversity of livestock breeds is an asset.

In France, ruminant livestock is still raised in a wide variety of breeds.

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RUMINANT LIVESTOCK FARMING AND BIODIVERSITY

WHAT ARE WE TALKING ABOUT?

BIODIVERSITY HAS THREE LEVELS:

- **The diversity of ecosystems** (or habitats shaped by geographical location, landscape, relief and climate),
- **specific diversity** (or species diversity),
- **genetic diversity of individuals** within the same species.

REMARKABLE BIODIVERSITY AND ORDINARY BIODIVERSITY.

"Remarkable" biodiversity (rare and endangered species) is distinct from **ordinary biodiversity**, which does not benefit from special conservation measures. Mainly influenced by agronomic and landscape factors, the latter refers to the more abundant fauna and flora (plants, pollinating insects, soil micro-organisms, etc.).

Domestic biodiversity refers to all the breeds and varieties that have been selected and crossed over the course of 10,000 years of agriculture.

ON FARM, BIODIVERSITY IS MAINTAINED AT 3 LEVELS:

the plot, the farm as a whole, where there are many complementary features between crops and semi-natural areas, and finally **the area surrounding the farm**. (Rieutort et al., 2014).

1 Meadows

Habitats for biodiversity

Grasslands support a diversity of flora and fauna.
They play a positive role in biodiversity on a regional scale by enhancing the habitat richness of agricultural and forestry-pastoral landscapes.
They also play a regulatory role for neighbouring annual crops, providing a home for pollinators and predators of crop pests (insect crop helpers, small insectivorous vertebrates, etc.) (Van Swaay, 2006).
In general, grasslands are richer in biodiversity than crop areas (Demarcq et al., 2022). It is important not to manage them too intensively (excessive fertilisation, grazing pressure, etc.) in order to preserve this high level of biodiversity.

Permanent grassland, a breeding ground for biodiversity

As areas subject to little disturbance, permanent grassland is a particularly good home for a variety of animal species at key stages in their life cycle (reproduction, calving, early growth and learning).
They also favour a diverse and abundant fauna and flora, which in turn favour pollinators and crop auxiliaries (Manneville and Leclerc, 2016).

Reduction in overgrowth

Without livestock farming, grasslands would give way to woodland or shrubland formations, which contain less biodiversity than a diversified landscape matrix favoured by ruminant livestock farming. This livestock-plant interaction is itself a source of species diversity, particularly for arthropods (Demarcq et al., 2022). In addition, by keeping environments open, grasslands help to fight fires and thus preserve forest biodiversity.

KEY FIGURES

In France, livestock farming maintains **13 million ha** of grassland. (Idele, 2018)

Between 2 and 7 times more animal and plant biodiversity in grassland soils, compared with arable land. (Alkemade et al., 2009)

88% of butterfly species depend on natural grasslands. (Van Swaay et al., 2006)

1,1 T of earthworms per ha of grassland (Manneville and Leclerc, 2016).

LEARN MORE...

...on the role of micro-organisms in the soil or crop diversification,

CONSULT THE SHEET ➡ « Ruminant farming and soil quality ».

2 Agro-ecological infrastructure (AEI)

Essential functions for biodiversity

AEIs, semi-natural environments in the landscape that form an integral part of the agricultural landscape (hedges, isolated trees, dry stone walls, forest edges, etc.), receive no fertilisers or pesticides, just like most grasslands. They are essential for biodiversity as they serve as refuge, resting, nesting and feeding areas for wildlife, provided that they are of high quality, of sufficient density, diverse and interconnected to allow the movement of species and their genetic mixing (Amiaud et al., 2014, Manneville et al., 2016). The Biotex tool takes these factors into account in its multi-criteria assessment of ordinary biodiversity.[11]

KEY FIGURES

1 ha of permanent grassland **= 160 linear metres** of hedgerows

compared with:

1 ha of arable land **= 56 linear metres** of hedgerows.

1 livestock unit maintains 90 linear metres of hedgerows. (Idele, 2018)

3 Landscape

Livestock plays a fundamental role in the landscape

Maintaining livestock on steep slopes prevents environments from closing (Ryschawy, 2015).
In mountain silvopastoralism, semi-natural grasslands are home to greater biodiversity than woodland and shrubland formations. The heterogeneity of landscapes induced by mixed crop-livestock systems has a positive impact on biodiversity: the presence of semi-natural and temporary grasslands, even monospecific ones, ensures continuity of food resources and shelter for wildlife throughout the year (Dumont et al., 2019).

Plot shape and size benefit biodiversity

Livestock farming maintains plots of complex shape and generally smaller size than arable farming, which is favourable to biodiversity, particularly for species with medium mobility (Manneville et al., 2016).
Conversely, homogeneous landscapes, with very large plots of land, no meadows, no hedges and no grass verges, have lower biodiversity (Amiaud et al., 2014). This is one of the main themes of the Biotex assessment tool.

KEY FIGURES

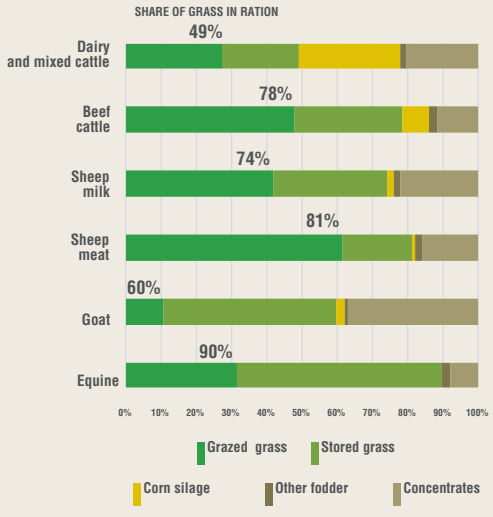
More than **45%** of bumblebee species richness is influenced by plot structure. (Manneville et al., 2016)

4 Animal feed

Promoting self-sufficiency and limiting imported feed

Ruminant feed is largely produced on the farm and consists in grass and fodder. The production of this forage helps to maintain permanent and temporary grasslands that are rich in biodiversity.
For a balanced ration, ruminants need concentrates (rapeseed cake, soya cake, wheat, barley, etc.): they provide energy, protein and minerals. These can be produced on the farm, purchased in France or imported, mainly from Europe or Latin America.
Protein autonomy is at the heart of the industry's concerns to limit imports and ensure the origin and sustainability of production conditions, thanks in particular to the Duralim association. Through the Cap Protéines project, the industry is working to reduce imports by increasing protein production on livestock farms (grassland and legume-based crops) and by developing the use of oilcakes and seeds produced in France and Europe. The aim of the Plan Protéines 2030 is to ensure France's protein sovereignty by 2030 (Cap Protéines, 2021).

AVERAGE COMPOSITION OF THE RATION OF HERBIVORES IN FRANCE (Cordier et al. 2020)



KEY FIGURES

90% of the feed (forage and concentrates) for grazing livestock is produced on the farm. (Idele, 2021a)

French livestock farmers use **55** million tonnes of grass dry matter every year, of which **58%** is grazed directly and **42%** is harvested and then stored as hay, silage or silage wrap. (Idele, 2012c)

On average in France, **89%** of the protein consumed by dairy cattle cannot be consumed by humans. This figure is **86%** for dairy goats and **89%** for dairy ewes. (Idele, 2022d)

Protein self-sufficiency:

86% for beef cattle
83% for beef sheep
70% for dairy cattle
68% for dairy sheep
47% for goats
(Cap protéines, 2021)

LEARN MORE... ...about animal feed,

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« Ruminant farming and animal feed » and « Ruminant farming and greehouse gazes ».

RUMINANT LIVESTOCK FARMING AND BIODIVERSITY

5 Farming practices

Grazing

The positive effects of good grazing practices

Grazing by herbivores influences the diversity of organisms through stocking, seasonality and the category of grazing herbivores (Amiaud et al., 2014). It helps to improve the spatial heterogeneity of plant species either on a regular basis (cattle, sheep) or by creating specific areas (horses) (Loucougaray, 2003). Grazing at a low stocking rate favours the specific richness of arthropod communities (Dumont et al., 2019).

Limiting the intensity of grazing avoids disrupting biodiversity through the consumption of grass, the deposition of excrement and trampling (Soussana and Lemaire, 2014).

Allowing meadows to rest also helps to preserve biodiversity.

KEY FIGURES

91% of dairy farms
93% of sheep farms and
96% of beef farms
use pasture.

Mowing

The positive effects of good mowing practices

The impact of mowing on floral diversity depends very much on the frequency and date of mowing in relation to flowering (Dumont et al., 2019). The species richness of grasslands is enhanced by a late first mowing date (Manneville et al., 2016).

The impact of mowing on fauna depends on the equipment and techniques used, but also on the habitat preferences and ecology of the species (Amiaud et al., 2014). Mowing from the centre of plots, mowing late on certain areas, and combining mowing and grazing are all positive actions for biodiversity.

KEY FIGURES

52% of permanent grassland and **42%** of temporary grassland are both mown and grazed. (MAA, 2020)

Fertilization

Vegetation development, trophic resources and nesting sites

Fertilizing grasslands leads to faster vegetation development and provides trophic resources and nesting sites that are different from unfertilised grasslands, which are beneficial for birds (Amiaud et al., 2014).

Similarly, land fertilised with livestock manure has more organic matter and micro-organisms useful for soil life than land fertilised with mineral nitrogen alone (Petitjean et al., 2018).

Optimising fertilization is essential and is supported by advisory approaches.

KEY FIGURES

6,2 million hectares of arable crops and grassland are fertilised exclusively with livestockmanure (Ademe, 2018), representing **25%** of French farmland. (Agreste, 2020)

Introducing grassland and organic fertilization into a rotation can increase soil bacteria and microscopic fungi by up to **50%**. (Petitjean et al., 2018)

Crop diversity

Crop diversity attracts wildlife

In annually farmed areas, the diversity of land cover provides resilience for wildlife.
The effects of aggressive farming practices on these species are limited when the crop mosaic is diverse (Manneville et al., 2014).

Incorporating temporary grassland into rotations

Incorporating temporary grassland into crop rotations is a major way of preserving soil fertility. This practice limits the need for tillage and ensures carbon inputs, thereby preserving soil organic matter and microfauna (Piutti et al., 2015).

6 Domestic biodiversity

Domestic biodiversity is increasingly taken into account

Domestic biodiversity is preserved in France on the one hand by the diversity of breeds present in different territories and on the other hand by the efforts made to broaden the selection base and diversity within each breed (Dumont et al., 2019). In France, the first conservation programmes for breeds with very low populations were launched in 1976 for the Bretonne Pie-Noire and Flamande breeds.

Since then, the profession, agricultural and livestock research players, regional parks and conservatories, and semen production centres have been working together to develop these breed conservation programmes.

Since 1999, a national cryobank has preserved the genetic material of livestock species, and in 2015 an observatory of genetic variability in ruminants and equines was set up.

Breed diversity and hardiness are adaptation factors

The ability to adapt to changing farming conditions is due in particular to the genetic diversity of the animals. The genetic aptitudes of hardy breeds, which can adapt to the constraints of certain environments, are important assets that have been highlighted (Dumont et al., 2019). This genetic diversity makes it possible to work on longevity traits, thereby reducing treatments, making better use of resources and improving resistance to the effects of climate change. In addition, products with quality labels such as PDO, PGI or certain red labels can be used to enhance the economic value of local or hardy breeds.

KEY FIGURES

In France:

54 cattle breeds (including **32** local breeds),

59 sheep breeds (including **46** local breeds),

15 goat breeds (including **11** local breeds)

(Idele, 2022a)

In France,

132 breeds are covered by conservation programmes.

(Dumont et al., 2019)

LEARN MORE...

...on preserving breed diversity,

CONSULT THE SHEET ➡

« Ruminant farming and traditional heritage ».

ACTIONS AND TOOLS IMPLEMENTED BY THE SECTORS

BioTEX Method

Multi-criteria assessment approach of ordinary biodiversity in livestock and mixed farming systems. BioTEX is based on several indirect factors that stimulate ordinary biodiversity:

- The diversity of crops forms an attractive mosaic for wildlife species;
- The heterogeneity of an area guarantees the diversity of species;
- The density of agro-ecological features and landscape continuity are a sign of habitat quality;
- The diversity of agro-ecological elements favours the diversity of flora and fauna;
- Management practices for AEIs to maintain their function as regulators of the species they host;
- Permanent grassland is a regulation zone on the farm (Manneville et al., 2014).

Since 2010, 5 training sessions have been held, 25 technicians trained and around 300 surveys carried out throughout France. The BioTEX tool is also being updated. These include indicators for the integration of buildings into the landscape matrix, intermediate crops, soil fertility and the impact of imports.

CAP'2ER® Tool

Assessment of the environmental impacts and positive contributions of a ruminant farm, using several indicators, including the "biodiversity" indicator. The tool is multi-sectoral, and now applies to dairy cattle, beef cattle, goats, sheep and arable crops

By 2024, 2,016 advisors had been trained and 45,000 CAP'2ER® diagnoses had been carried out since 2015 in connection with the Carbon Dairy, La Ferme Laitière Bas Carbone, Beef Carbon, Green Sheep, Elevage Caprin Durable and Cap'Climat initiatives. The tool is being rolled out at regional, national and European level.

FAO Tool for Agroecology Performance Evaluation (TAPE)

Ensuring the multi-dimensional performance of agro-ecological systems through the different dimensions of sustainability.

With regard to biodiversity, the method assesses the relative importance of crop varieties, livestock breeds, trees and semi-natural environments on farms (sub-indicators 8.1, 8.6 and 8.7 of SDG 2.4.1) (FAO, 2019).

IDEA method

Assessing the sustainability of farms. Used to identify ways of improving or making progress towards greater sustainability in individual or collective agro-ecological transition initiatives.

Tests conducted on over 600 farms (Ministry of Agriculture and Food Sovereignty, 2023).

DEO tool: Sustainability in sheep farming

Simplified sustainability performance evaluation methodology adapted to sheep systems. 24 environmental, economic and social-territorial indicators

This DEO tool is based on the CAP'2ER® Level 1 tool for environmental indicators (energy and climate, biodiversity and preservation of natural resources). Thanks to the DEO project, the industry now has a simplified methodology for assessing sustainability performance adapted to sheep systems, transcribed into an operational Excel prototype and tested on around a hundred farms. As at 30/09/21, for meat sheep, 2.3 ha Biodiversity eq/ha Total sheep area and for dairy sheep, 1.10 ha Biodiversity eq/ha Total sheep area (Idele, 2021b).

ACTIONS AND TOOLS IMPLEMENTED BY THE SECTORS

Cap Protéines

The Cap Protéines project aims to develop the protein autonomy of ruminant farms:

- by increasing protein production in livestock farming through legume-based meadows, pure legumes and cereal-proteaginous mixtures;
- by using oilseed cake and seeds produced in France and Europe to replace imported soyacake in livestock farming.

The Cap Protéines programme involved 2 years of research, development, innovation and transfer. It brought together more than 200 technical partners, 100,000 oilseed and protein crop producers, more than 100,000 ruminant breeders, 330 pilot farms, 21 experimental sites and 19 agricultural college farms. It has helped to increase the area under legumes by 40% and to maintain 2 million hectares under oilseed and protein crops.

Tools have been developed to help farmers achieve self-sufficiency:

- Devautop, a tool for diagnosing protein autonomy;
- AutoSysEl, a resource platform on self-sufficiency;
- HappyGrass, a smartphone application for grassland management;
- Optim'AL, a tool for nitrogen concentrate self-sufficiency;
- Perpet, a serious game for assessing and ageing grassland;
- My Luzerne, a decision-making tool for growing alfalfa.

The aim of the Plan Protéines 2030 is to ensure France's protein sovereignty by 2030 (www.cap-proteines-elevage.fr).

Duralim

The mission of the Duralim association (of which the CNIEL is a signatory) is to 'promote and improve the sustainability of livestock feed' by:

- Uniting all the players in the French plant and animal sectors around the challenge of sustainable animal nutrition;
- Promoting the assets and collective actions already initiated by the French industry;
- Encouraging commitment to collective and individual priorities and ensuring that they are followed up;
- Recognising the expertise of an industry that is making progress in response to society's expectations.

In 2018, with the support of the upstream and downstream sectors, animal nutrition companies made a commitment to achieve 100% sustainable sourcing by 2025, with a target of no deforestation (www.duralim.org).

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