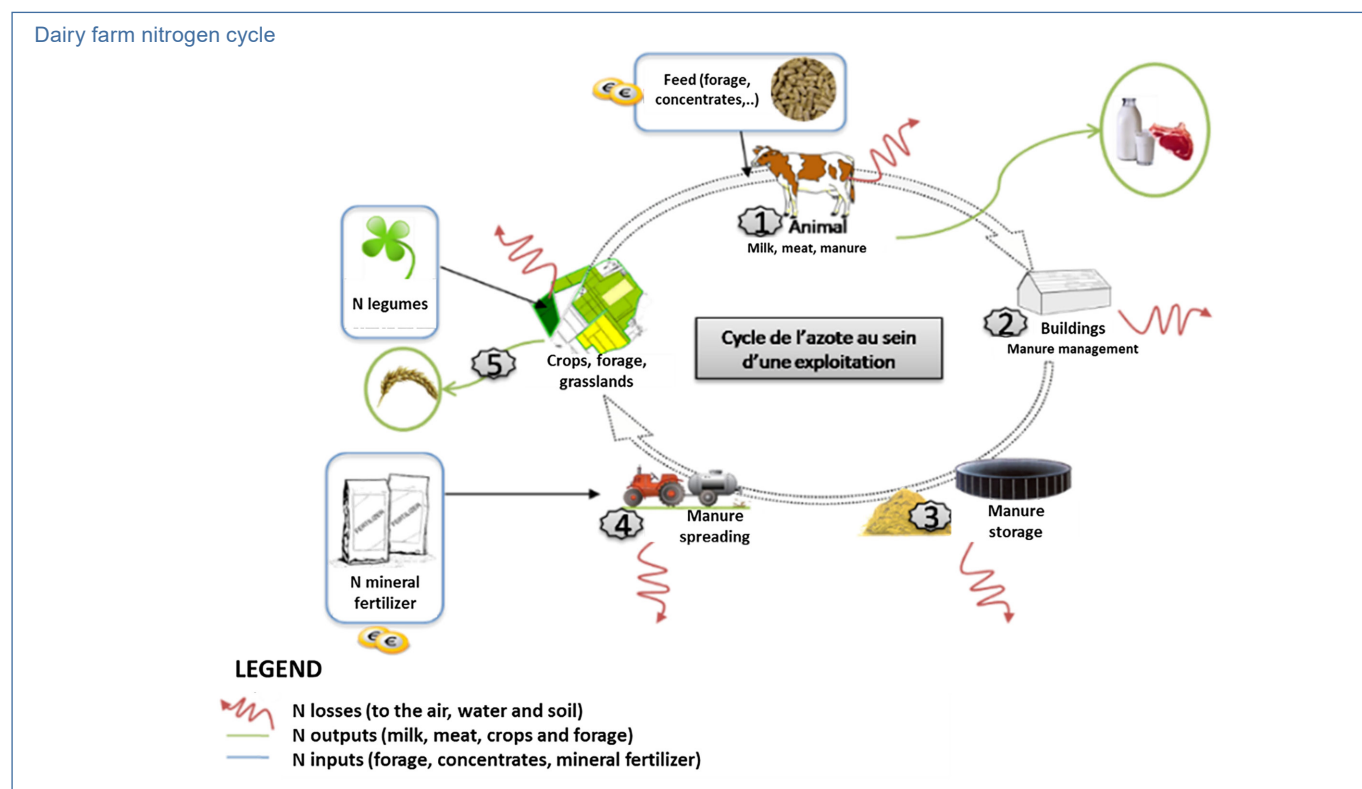


MINERAL RESOURCES

Optimal use

More efficient use of resources (e.g. land, labour, feed, fertilizer, fossil fuel and water) is one of the biggest challenges to face dairy farming in Europe, directly affecting competitiveness, social acceptability, environmental sustainability and biodiversity/habitats. Feed efficiency is an important element in this. By improving feed efficiency in dairy cattle herds, dairy farmers have the opportunity to address two main issues which they encounter. First, feed costs have a direct impact on the profitability of the dairy farm,

so increasing feed efficiency contributes to a more profitable farm. Second, an improved feed efficiency can help to reduce the negative impacts of dairy production on the environment, by lowering greenhouse gas (GHG) emissions and nutrient losses to the environment associated with cattle production. This also addresses increasing societal concerns regarding this issue, thereby contributing to an improved social acceptability of the sector.



Nutrient cycling on the farm

In dairy farming, opposed to arable or intensive live-stock farming systems, cropping and animal husbandry are connected. In European dairy systems, on average 60-80% of the consumed feed is grown on own farm land. The nutrients used to fertilize grassland and fodder consist of excretion products from the herd: slurry and/or solid manure produced indoors, and droppings during grazing. As a result, dairy farming is characterized by relatively closed cycles of nitrogen (N) and phosphorus (P): feed turns into manure and manure turns into feed. Nutrient losses that occur by selling milk and cattle and through emissions are compensated by purchasing feeds and fertilizers.

More efficient use of feeds and fertilizers results in a better cycling of nutrients and therefore in lower losses to the environment and lower input purchase costs. Although efficiency is partly determined by conditions that cannot be affected by the dairy farmer, such as soil type or weather conditions, management is generally the most dominant factor. More specifically, an optimized management of the diet and of the fertilization (use of manure) is the main lever for improving overall nutrient efficiency.



MINERAL RESOURCES

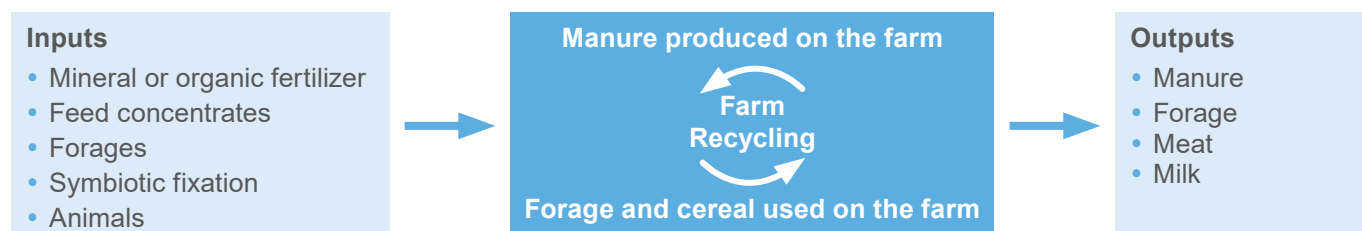
Optimal use

N&P balances: a good indicator

An important tool for assisting farm management, is the use of nutrient balances. N and P balances allow to assess the potential of production of a system by taking inputs and outputs into account. A balance characterizes the quantity of nitrogen and phosphorus which is lost or immobilized at a certain level within a system. These balances can be quantified at different levels,

e.g. the farm level, the soil level, a specific production level.

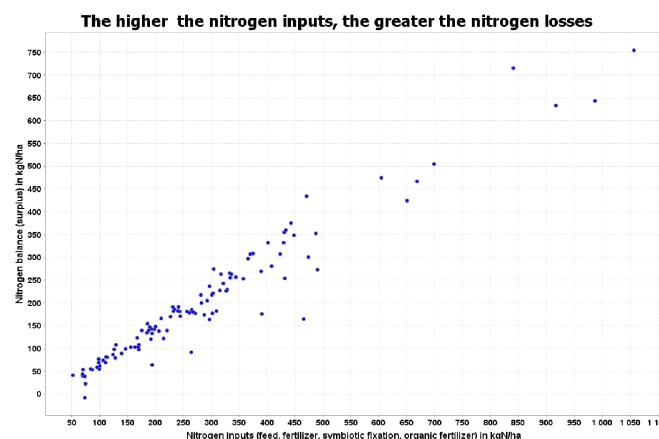
By determining N and P balances on your farm, it makes it possible to know your efficiency in a precise way and thus identify pathways for progress.



Results from the Eurodairy Pilot Farm Network

In the EuroDairy Pilot Farm Network, dairy farms with a high level of nitrogen inputs show the greatest nitrogen losses (surplus). We found that the level of inputs depends mainly on the resources available on the farm and this availability is driven by the pedo-climatic context (possibility to produce forage like maize silage or to produce grass) or by the accessibility to agricultural area (price of the land).

This level is also linked to the type of dairy system and the strategy led by farmers (with or without grazing, high intensive or not, organic or not...).



TESTIMONY

Sylvain Foray, Institut de l'Elevage

“Producing more milk with less nitrogen losses is one of the targets for the future. Nitrogen balances are a very interesting indicator to assist in managing this. At the farm scale, the nitrogen surplus corresponds to the difference between imported nitrogen (purchases of feed concentrates, forage, fertilizer, import of manure) and nitrogen valorized in production (milk, meat, crops). This surplus, determined by the nitrogen balance, is expressed in kg of nitrogen per hectare. In general, the larger the inputs, the higher the losses (surplus). The nitrogen balances allow a first good global approach to assess the nitrogen management on dairy farms. By focusing on each

category of input (mineral fertilizer, feed concentrates...) and comparing with standards, it's possible to define where the gain can be done. The use of more complex tools like ANCA in the Netherlands or CAP'2ER® in France where the nutrient cycles are visualized allows to build action plans on farms to improve their technical/economical/environmental performances. It is clear that the optimization of practices, focusing on higher animal feed self-sufficiency and a greater fertilizer autonomy, within each dairy system offers opportunities to reduce the use of mineral inputs while maintaining the level of production, resulting in higher farm efficiency.”

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