

Case study Lungau, Austria

What ?

Closing nutrient cycles at dairy farms; developing feeding strategies, measuring gaseous emissions.

How ?

Sampling and assessment of soil, forage and manure on the farms; Life Cycle Assessment (LCA) for each farm.



Closing nutrient cycles at dairy farms

Twenty-two farms representative of the farming system in the region were selected to help study the N and P cycles of grassland-based dairy farms. Soil, forage and manure samples are taken from the farms every year to get an overview of the nutrient cycles.

Additionally, each farm documents the entire processes of **plant production and animal production**. Based on this documented data, a Life Cycle Assessment (LCA) was conducted for each of the farms.

Based on the milk yield per area (kg ECM/ha), the 22 farms were divided into three groups :

- **Disadvantaged extensive farming (D)** : < 4,900 kg ECM/ha
- **Average extensive farming (A)** : 4,900-8,200 kg ECM/ha
- **Preferred extensive farming (P)** : > 8,200 kg ECM/ha

First results show, that the groups D and P are able to nearly close their N and P cycles (Group D, however, has a slightly negative P balance).

Group A, on the other hand, has a clearly negative N and P balance.

Forage sample



Feeding strategies and gaseous emissions

Different diets (0, 20 and 40% of concentrate) are tested on various genotypes of dairy cows (Holstein Friesian conventional breeding, Holstein Friesian New Zealand, Holstein Friesian lifetime performance breeding and Simmental).

Besides feed intake, milk yield and efficiency of milk production, methane emissions of dairy cows are measured additionally in respiration chambers. The results will produce conclusions on which genotype, which diet composition and which combination of genotype and diet composition will lead to the most efficient milk production in a certain geographic region.

