



Greenhouse gas exchange over grazed systems

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Grasslands act as sinks and sources of greenhouse gases (GHG) and are, in conjunction with livestock production systems, responsible for a large share of GHG emissions. Whereas ecosystem scale flux measurements (eddy covariance) are commonly used to investigate CO₂ exchange (and is becoming state-of-the-art for other GHGs, too), GHG emissions from agricultural animals are usually investigated on the scale of individual animals. Therefore eddy covariance technique has to be tested for combined systems (i.e. grazed systems).

Our project investigates the ability of field scale flux measurements to reliably quantify the contribution of grazing dairy cows to the net exchange of CO₂ and CH₄. To quantify the contribution of the animals to the net flux the position, movement, and grazing/rumination activity of each cow are recorded. In combination with a detailed footprint analysis of the eddy covariance fluxes, the animal related CO₂ and CH₄ emissions are derived and compared to standard emission values derived from respiration chambers.

The aim of the project is to test the assumption whether field scale CO₂ flux measurements adequately include the respiration of grazing cows and to identify potential errors in ecosystem Greenhouse gas budgets.