# Carbon dioxide and methane budget of a grazed grassland

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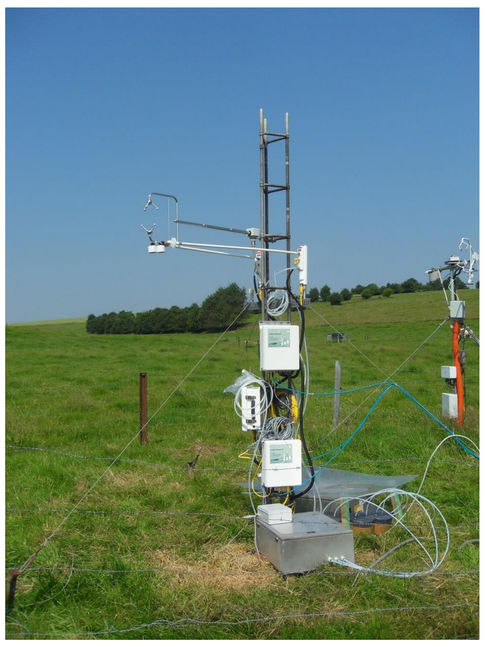
## Carbon dioxide Fluxes

- Eddy covariance
- Chamber measurements
- Data acqusition
- Quality control
- Methods validation

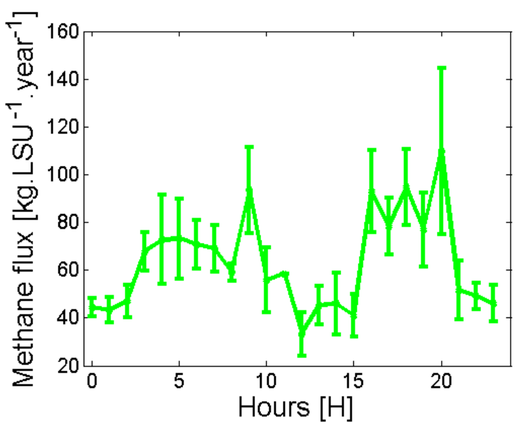


**Net Ecosystem Exchange**
**-150 $gCm^{-2}y^{-1}$**

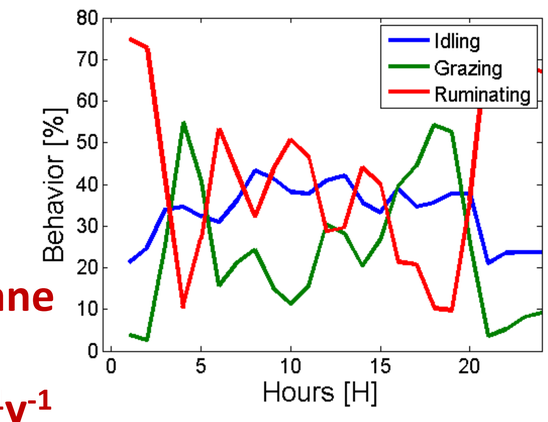
## Methane Fluxes

- Eddy covariance
- Cattle geolocalization
- Non invasive

➢ Soil emissions
➢ Enteric emissions




**Cattle methane emission**
**50 $kgCH_4LU^{-1}y^{-1}$**




**Total Respiration**
**+2074 $gCm^{-2}y^{-1}$**

**Cattle Respiration**

**Photosynthesis**
**-2225 $gCm^{-2}y^{-1}$**

**Manure**
**-22 $gCm^{-2}y^{-1}$**

**Harvest**
**+8 $gCm^{-2}y^{-1}$**

**Food Imports**
**-26 $gCm^{-2}y^{-1}$**

**Meat production**
**+2 $gCm^{-2}y^{-1}$**

## Grassland productivity:

- Pressure plate herbometer
- Protected enclosures

**Productivity**
**≈ 7 t ms $ha^{-1}$**

**Carbon Storage**

**Carbon Leaching**
**+7 $gCm^{-2}y^{-1}$**

Carbon Budget : $NEE+F_{CH4-C}+F_{manure}+F_{import}+F_{harvest}+F_{product}+F_{leach}$ =
**-173$gCm^{-2}y^{-1}$**

## Average Annual balance of the grassland:

**$CH_4$ emissions :**
**11,5 ± 3,3 g $CH_4m^{-2}y^{-1}$**
≈325 ± 90 géq$CO_2$ $m^{-2}y^{-1}$

$N_2O$ ?

**Net $CO_2$ exchange:**
**-150 ± 45 $gCm^{-2}y^{-1}$**
≈ -550 ± 165 géq$CO_2$ $m^{-2}y^{-1}$

**The $CO_2$ storage seems to be able to compensate the methane emissions when the cattle are on the pasture**

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