

## Aims of the project

Development of an automatic system for recording feeding behaviour of grazing animals at pasture.

Development of a wireless system for transmitting data from the animal to a remote computer.

Implementation of ICT technologies for modelling livestock farm management in order to improve the efficiency of forage resources utilisation in respect of the environment and animal welfare.

### Partners Project

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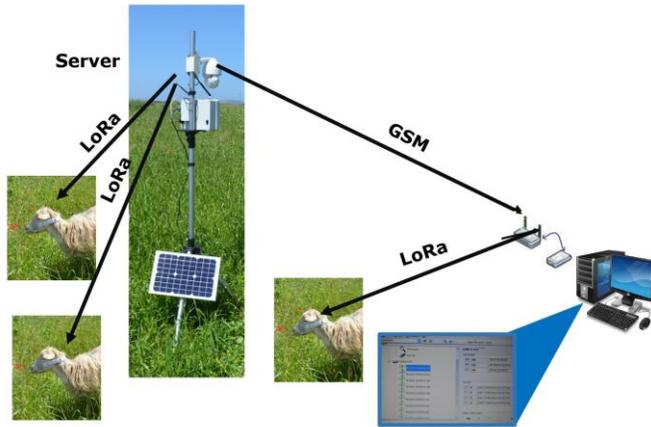
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## Project BEHARUM

Use of Information and Communication Technology (ITC) to monitor feeding behaviour in grazing ruminants





## BEHARUM device transmission scheme

### Why BEHARUM project?

In Sardinia the permanent pasture and forage cultivated surfaces devoted for grazing occupy an area of about 1.3 million hectares, representing more than 50% of the total regional area. Pasture is the main feed resource for livestock but it is also important for the high biodiversity and because it represents an essential component of the Island landscape

Monitoring the behaviour of ruminants in near real-time is important to check the living conditions of animals, and make effective decisions about feed supplement and pasture management to optimize animal performance, welfare and environmental outcomes.

Understanding the mechanisms that regulate intake and food preferences of animals may enable a more economic and environmentally friendly management of food resources, in line with the objectives of competitiveness and sustainable development of regional, national and European policy, as indicated by the Rural Development Program of the Sardinia Region.

### BEHARUM device

The project developed an accelerometer-based device (BEHARUM) for recording feeding behaviour of ruminants fed at pasture. The device consists of a halter, a local server and a remote computer station.

**The halter** is equipped with a three-axial accelerometer sensor able to record jaw and head movements. Data can be stored in a micro SD card or sent to a receiver nearby computer equipped with an antenna or to a remote computer through a local server

**The server** may be placed in the field close to the animals and includes a wireless transmission-reception system of the data that uses GSM cellular network. Data can be stored and sent afterward to remote computer.

**The remote computer station** has a software for the halter switching on and management and for the acquisition of recorded data.

## Main results

BEHARUM device used with dairy sheep allows a good estimation of:

- **Grazing time**
- **Ruminating time**
- **Resting time**
- **Number of bites**

### Future outlook

Calibration of BEHARUM device with other ruminant species (cattle, goats).

Addition in the device of other sensor such as those to estimate animal localisation and displacement in the field (Global Positioning System, GPS) and to estimate animal energy expenditures (heart rate monitoring).