

EuroTeQ Collider 2024

Challenge

Smart Grazing: how to improve the sustainability of livestock production?

Category

Nature

Focus

Research

Meat, milk and cheese are produced with domestic grazers such as cattle and sheep. This livestock are associated with greenhouse gas (GHG) emissions, and are exposed to climate change. In particular, extreme weather (high temperatures and humidity) causes heat stress and affect animal welfare and their productivity. Stress animal produce little and still emit GHG, which exacerbates climate change.

Problem definition

Grazing in open environments is important for the welfare of cattle and sheep. Poro grazing can affect the storage of carbon in the soil, and grazing conditions could increase the likelihood of animals being exposed to stress. The worst outcome is to have stress animals, that produce little milk or meat, and continue emitting GHG. Monitoring and understanding all these dimensions concurrently is a key problem for the livestock sector.

Description

The challenge to address is to understand how domestic grazers sense the environment they are exposed to and what are the consequences for their wellbeing, productivity and the associated environmental outcomes. These environmental outcomes can include effects on soil, air or waterbodies, or impacts on biodiversity.

Key questions

- Which sensing technology could be used effectively to both monitor grazers and to improve outcomes for the animals?
- Do similar tech can be used to monitor the effect of grazing animals onto their environment?
- Can these selected technologies be low-cost so that they can be deployed in low-income countries?
- Which ingredients define „smart grazing technologies“?

Links

<https://www.lss.ls.tum.de/lssys/home/>

Partner organisation: <https://www.ilri.org/>

Skills

Open to groups from BSc to PhD, interested in digital tech (drones, cameras, ear tags, collars), skills to process large data, programme algorithms, and desire to develop low-cost prototypes.

Partner

At the Chair of Livestock Systems at TUM investigate options to manage livestock to reduce environmental-productivity trade-offs. We are interested to develop science-based recommendation to improve the sustainability of livestock globally, and in particular to support livestock-dependent communities in the Global South. We collaborate with several partners and in particular with the International Livestock Research Institute (ILRI), with offices in the tropics.