Sheep proximity and presence at feed resources using BLE (Bluetooth Low Energy) technology

TechCare is investigating potential new technologies that could help sheep and goats' welfare management. One of them is the use of Bluetooth Low Energy beacons and receivers, to assess sheep proximity and presence at resource points. The prototype has been built for and tested by SRUC in Scotland (UK), at their Hill & Mountain Research Centre, Kirkton & Auchtertyre research farms. It is in a challenging environment, where sheep graze outdoor all year round. The experiment took place in Jan-Feb 2022, when 100 ewes were fitted with BLE collars. Receivers were placed at feed resources (haystacks and molasses buckets), and allowed the acquisition of presence/absence of beacons (ewes), then transmitting this data via a LoRaWAN (Low power area network), and logging it within a network server environment – creating both real-time data and broad databases. At the same time, ewe observations and welfare assessments (lameness, weight change, Body Condition Scoring) were carried out every week. Converting this data, together with its context and welfare assessments, will allow the development of algorithms for meaningful information and potential alerts for the farmers. For instance, if an ewe stops going near the feed resources, could it be due to a potential welfare issue that the farmer should investigate. Such information could be crucial for small ruminant farmers with animals grazing in harsh environments with no easy access and supervision.

Receiver over the molasses bucket (©SRUC Kirkton)

Ewe with BLE beacon (©SRUC Kirkton)