

Remote monitoring of livestock

sagentia

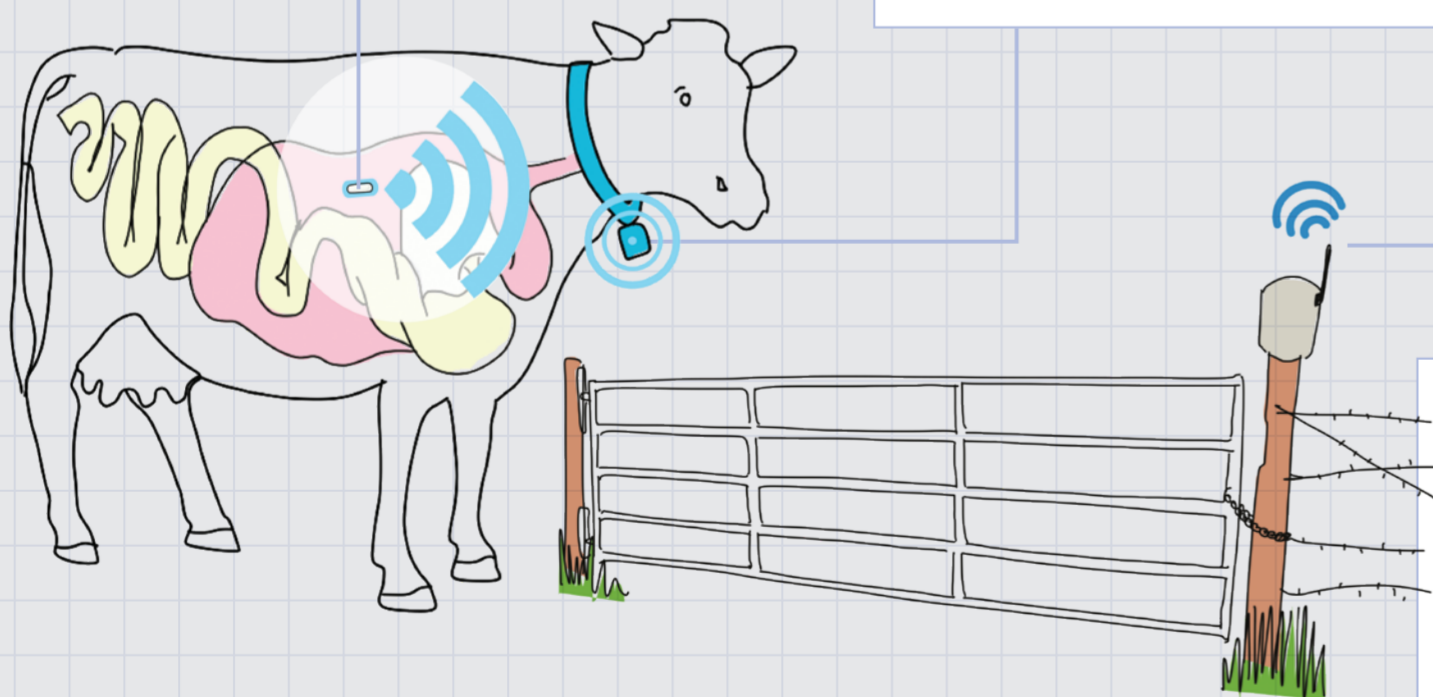


1 Smart pill (in rumen)

- ▮ Sensor: pH, temperature, pressure
- ▮ Wireless data transmission to external collar (e.g. MICS)
- ▮ Power: Delivered by two different metals coming into contact with the chemical environment of the rumen

2 Collar (neck)

- ▮ Heart rate, or respiration sensor, combined with GPS to ascertain location
- ▮ Wireless data received from smart pill and relayed to external collar via implantable communications protocol (e.g. MICS). External collar relays data to base unit in field via low power radio (e.g. LoRA)
- ▮ Power: Kinetically harvested through motion of the collar



3 Wireless base units

- ▮ Aggregate data from herd via low power radio (e.g. LoRA)
- ▮ Relay data to the cloud via cellular or a local tablet PC via BLE



4 Augmented reality visualization

- ▮ Helps the farmer or veterinarian make sense of data and identify problem areas in herds

Market need

Using low cost wearable and ingestible devices to monitor the health of livestock in real-time - is almost a reality. The practice is already established in the medical sector.

Data generated from a range of sensors can be used to monitor digestive health and potential infection.

By monitoring the nutritional benefit that a herd receives from different feed combinations, it will be possible to optimize the nutritional health of the animal and deliver improved milk production.

Similarly, we anticipate significant cost & efficiency savings by veterinarians having the ability to detect health issues as they emerge.

Technical options

- Gastric pressure, body temperature & pH could be measured in real time and wirelessly transmitted by an ingestible device powered by chemical processes in the cow's rumen
- A collar containing additional sensors could further enrich the data set
- Acoustic technologies to monitor gastric health, or heart rate and respiratory monitors using ultra wide band technology, could be integrated in the collar
- Energy harvesting could be used to power the device (mastication motion or from device swinging under the neck)
- Data is relayed to a locally placed hub via a low power radio technology, such as 'LoRA', and then relayed to the cloud via cellular
- Intuitive visualisation tools like augmented reality will be important for helping the farmer, or veterinarian, make sense of data and identify problem areas in herds