Drones – the future of livestock farming and rapid disease detection?

The proposed development of a real-time system for disease detection in food-producing animals

Questions

- Can we develop a system to **detect disease** prior to the development of clinical signs that is **non-invasive** and **rapid**?
- Can we adapt advanced **machine learning methods** being utilised in precision crop agriculture into the **livestock sector**?

Research Stages

1. Detection/counting of cattle in pasture from UAV images
2. Creation of annotated aerial UAV dataset of cattle in pasture
3. Detection of 'downer cows' from UAV images
4. In parlour thermography testing
5. In field thermography testing

Background

- Much work has been carried out in the area of non-invasive **thermography** using infra-red imaging thus far. It is hoped that expanding this to a **multispectral imaging system** will yield improved results.
- **UAVs** are ubiquitous, rapid and cost-effective, they are the ideal tool for information gathering.
- **Machine learning** methods are already being used to diagnose disease in precision crop agriculture.
- This research draws on the **interdisciplinary** combination of veterinary medicine, epidemiology, engineering and physics to apply in the field of **animal health surveillance**.

Research Outcomes

Short-term
- A UAV-based multispectral imaging system that will notify a farmer if an animal is suspected of illness due to inactivity, hypothermia or hyperthermia

Long-term
- Time - saves the time of both farming and veterinary personnel
- Money – reduced economic losses from disease which in turn leads to increased profits
- Welfare – could favour more extensive farming systems
- Disease control - reduced pathogen transmission leading to lower disease incidence

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