

BSAS Virtual Conference – 12<sup>th</sup> -15<sup>th</sup> April 2021

*The Challenge of Change – the New Normal?*

Sheep production session – chaired by M. Lee



# Precision sheep management in the uplands

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*Leading the way in Agriculture and Rural Research, Education and Consulting*



# Upland sheep production: challenges

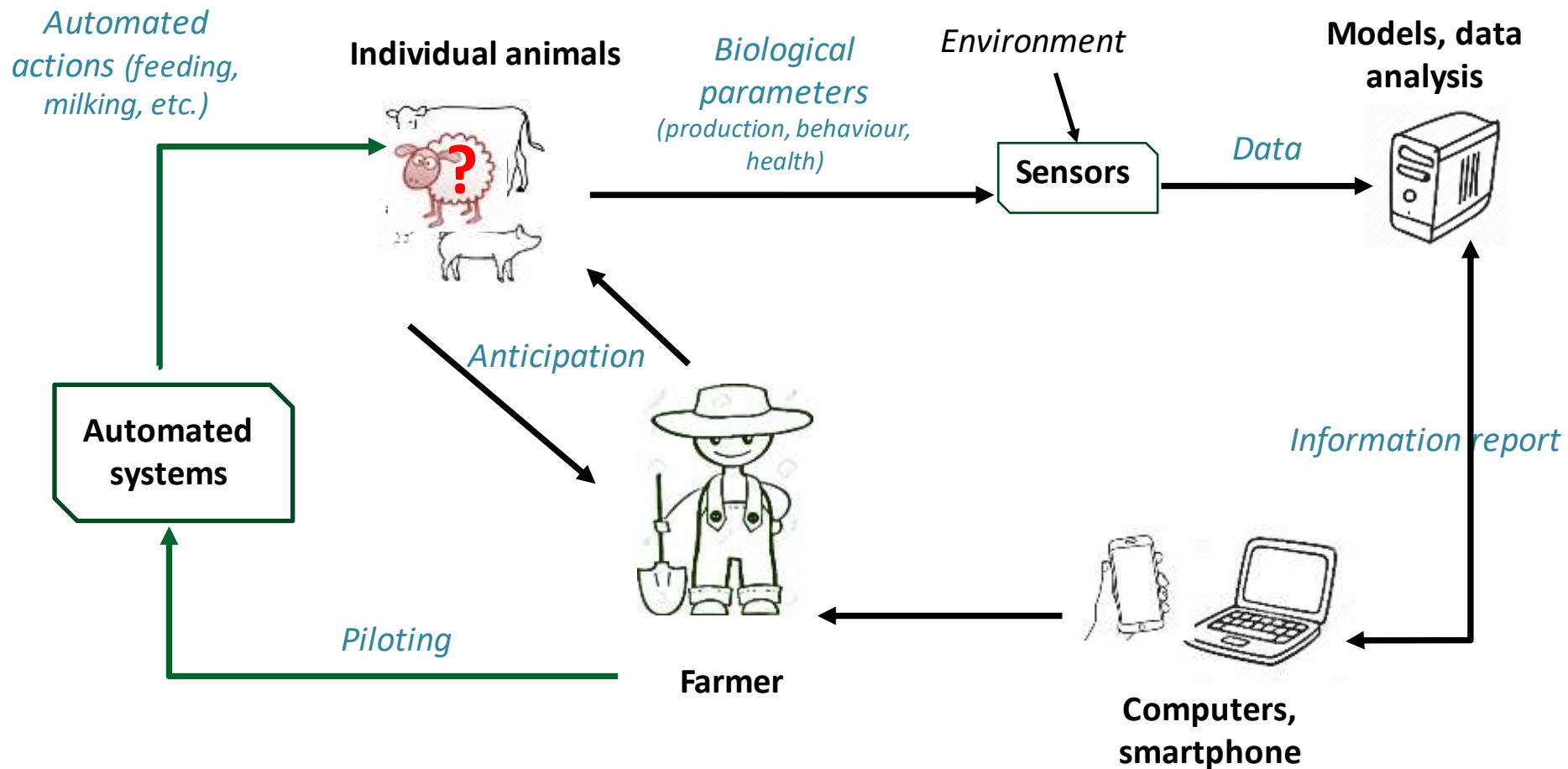
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- Rangeland/remotely based
- Harsher environment/survival issues
- Welfare
- Diversity of systems
- Sector less organised
- More traditional/ageing sector
- Lack of labour
- Less efficiency/low productivity
- Low level of income



# Precision Livestock Farming

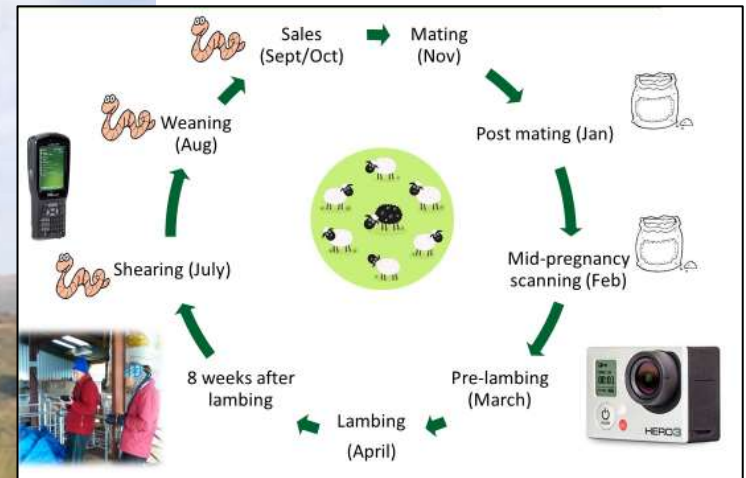


# Challenges...precision farming?

- Rangeland/remotely based **Monitoring (production, welfare)**
- Harsher environment/survival issues **Monitoring**  
**Alerts/warning systems**
- Welfare **Alerts/warning systems**
- Diversity of systems **Common protocols for collection or monitoring**
- Batch level **Individual monitoring** **Data to inform farmer individually**
- Sector less organised **Benchmarking** **Efficiency gain**
- More traditional/ageing sector **Younger generation interest?**  
**Better life/work balance**
- Lack of labour **Time saving**
- Less efficiency/low productivity **Monitoring** **Alerts/warning systems**
- Low level of income **Efficiency gain** **Diversification**



# Some initiatives – SRUC Hill & Mountain Research Centre

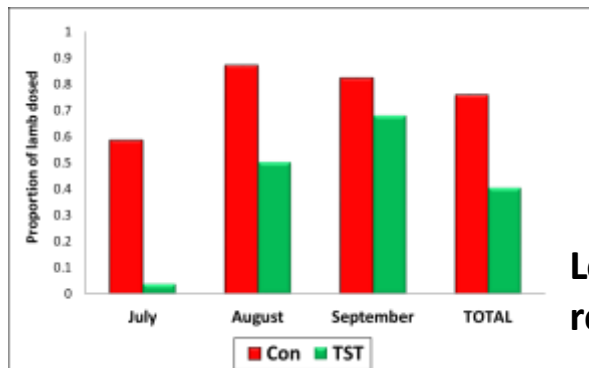
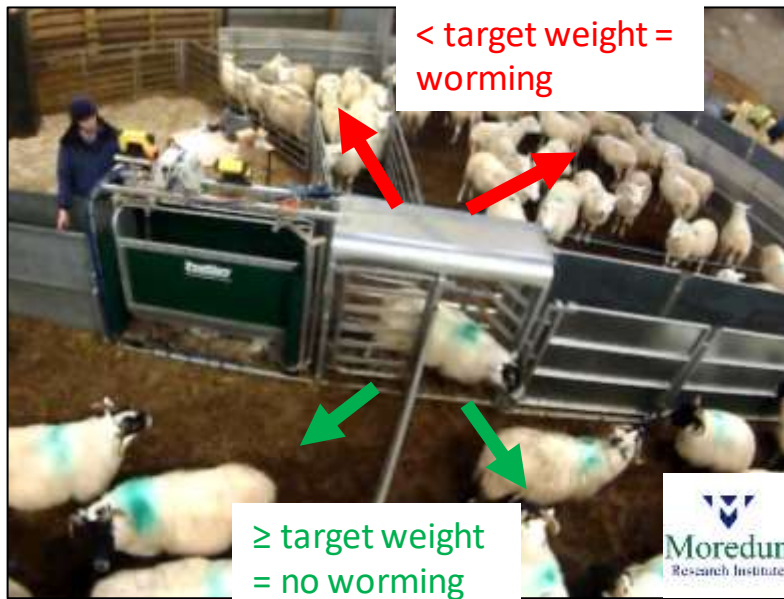


- Targeted feeding
  - Targeted worming
  - Targeted management
- > 40% labour savings



# Targeted Worming

## Happy Factor™ algorithm



**Less wormer, less anthelmintic resistance, less labour, same lamb weight**

## ...led to InnovateUK project:

*Smart Sheep – precision livestock farming and sustainable sheep production*

### Smart sheep project



To encourage uptake of precision livestock farming by developing new, co-designed tools by:

1. Improving the application of on-farm digital technology through co-design.
2. Validation of improved PLF digital technology on commercial farms.
3. Knowledge exchange and demonstration of new tools



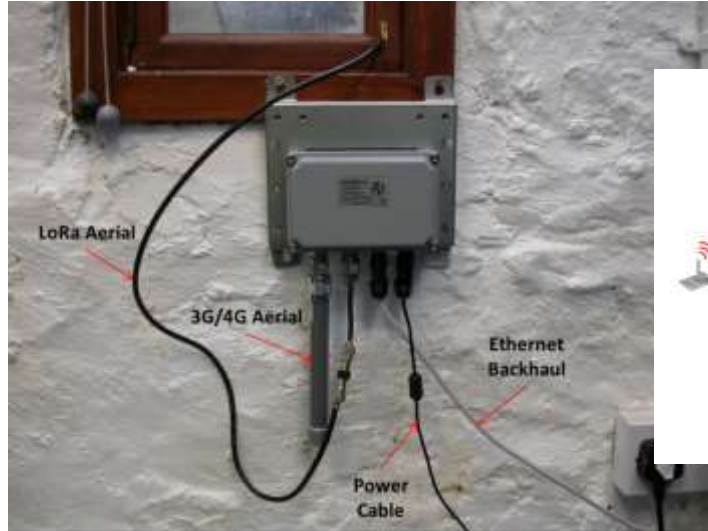






# IoT & LoRa opportunities

Two indoor ethernet connected gateways, plus two new off-grid 4G connected gateways  
=> enabling data from a range of sensors deployed across the farm to be accessed in near real-time via “The Things Network”.



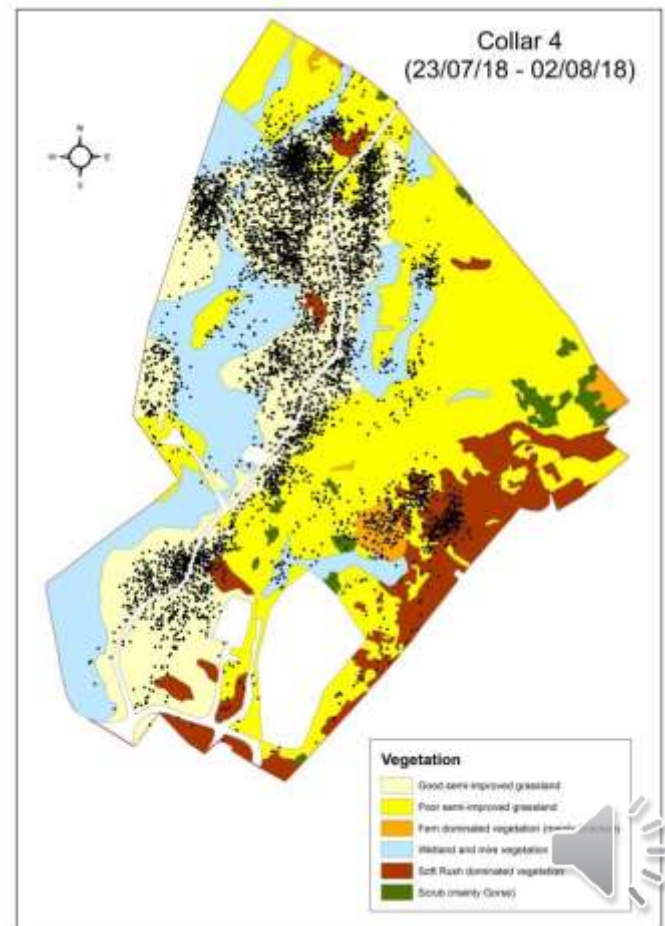
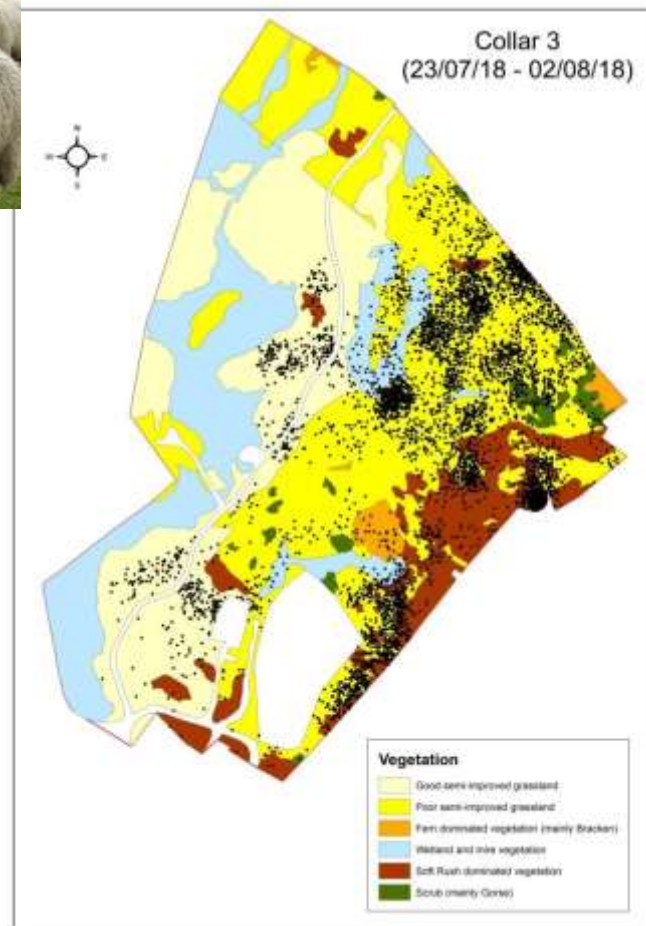
*Indoor ethernet connected LoRaGateway*



*Off-grid 4G connected LoRaGateway*

# Tracking sheep & behaviour

“Hoofprints” LoRa enabled GNSS unit with three sets of tri-axial motion sensors





# Welfare management using PLF?

- **Project:**
  - EU H2020-SFS-2019-1, Improving animal welfare
  - Type: Innovative Action
  - Starting date: 1 September 2020
  - Duration: 48 months
- 
- Focus on **sheep and goats farming systems**
  - **9 countries**
  - **19 partners**



# Project steps and outputs

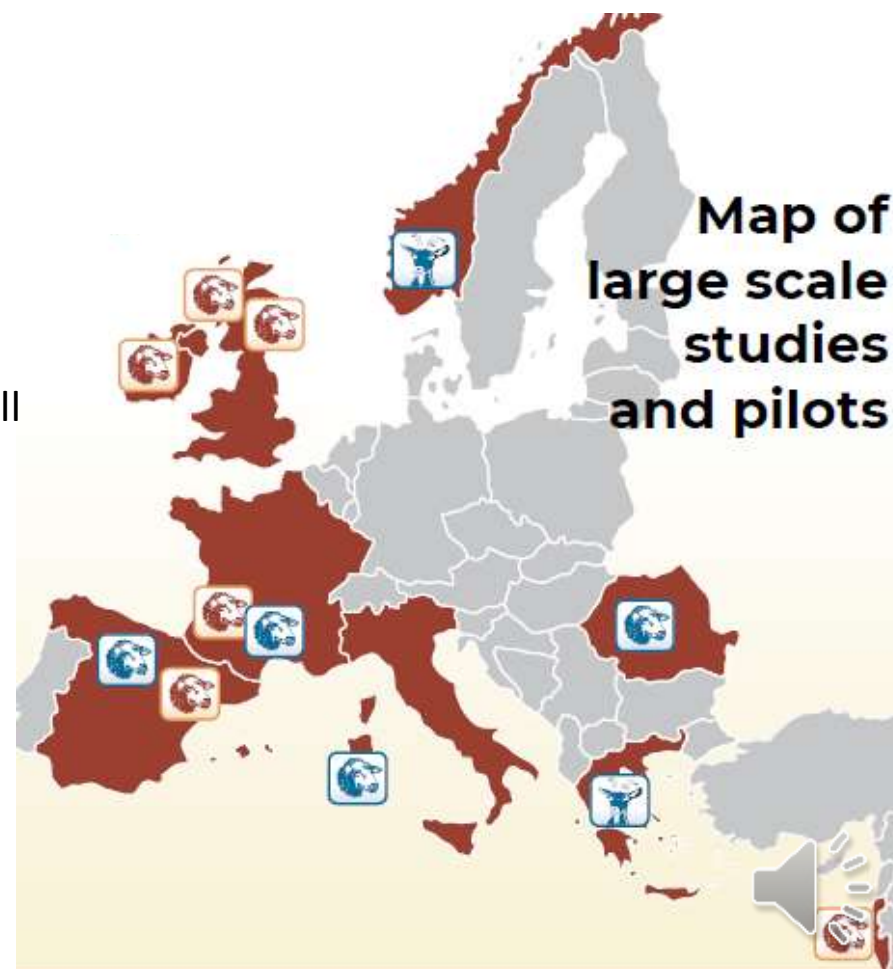


- **5 key steps**

1. Prioritise welfare challenges and issues
2. Identify potential innovative technologies solutions
3. Validate the solutions in different and real conditions (pilots and commercial farms)
4. Define appropriate business models
5. Communicate widely the results to the small ruminant sectors and beyond

- **2 main outputs**

1. Ready to use innovative solutions for sheep welfare management
2. Guidelines for promising solutions

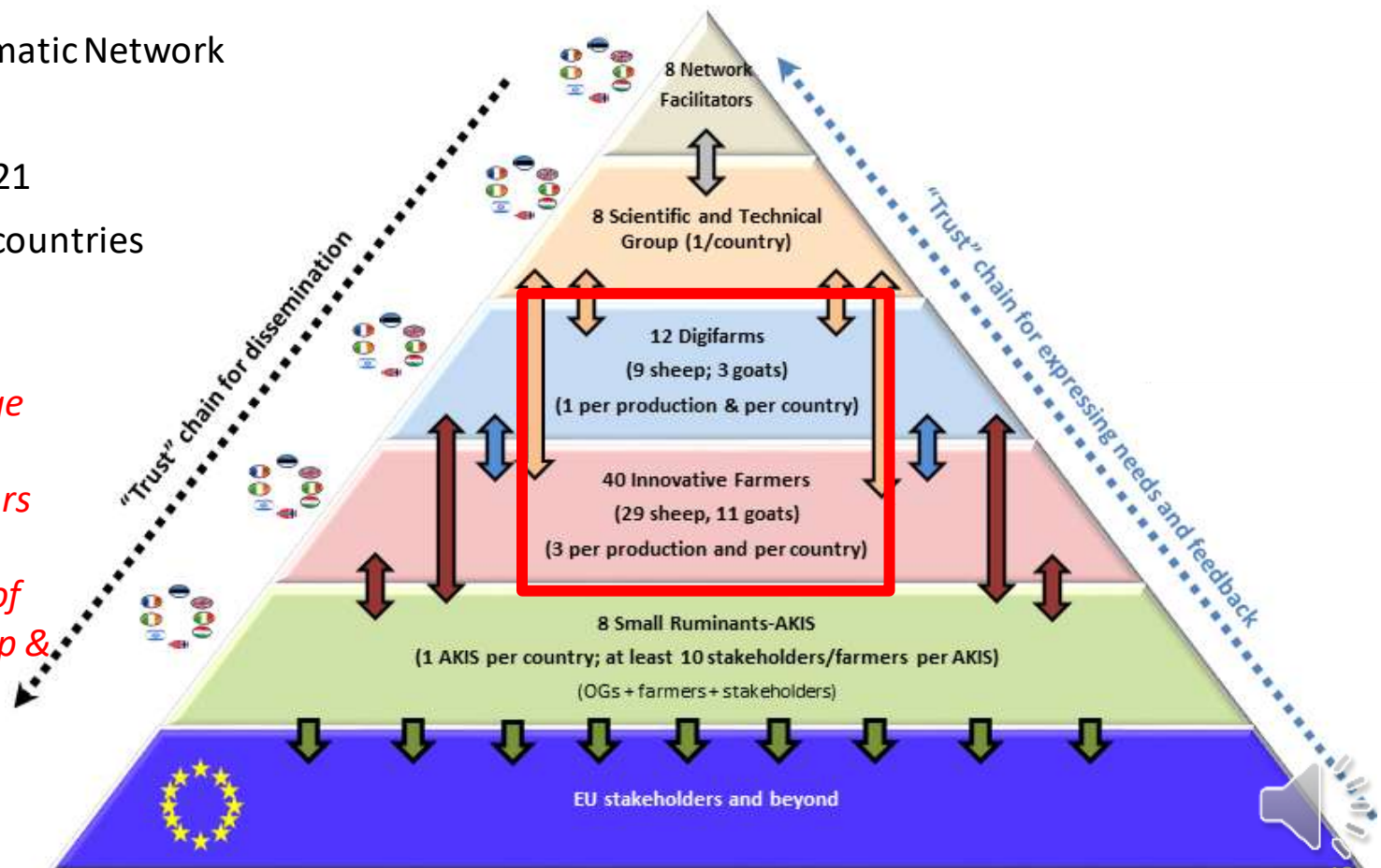


# Uptake of PLF?

## Sm@RT: Small Ruminant Technology – PLF and Digital technologies for small ruminants

- H2020 EU Thematic Network
- 3 years
- Starting Jan 2021
- 11 partners, 8 countries

*Knowledge exchange between farmers/stakeholders and researchers to encourage the use of PLF and DT on sheep & goats farms*



# Conclusions



- Range of precision farming options/initiatives
- Opportunities for farmers
- Recent recognition of sheep sector potential
- Recent projects outcomes crucial for upland sheep farming



# Acknowledgments



- **Colleagues**
  - at SRUC Kirkton Hill & Mountain Research Centre
  - At MRI
- **Partners in Smart Sheep**
- **Partners in TechCare**
- **Partners in Sm@RT**



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...and  **bsas**  
british society of animal science for inviting me today!

