

FARM TECH CIRCLE

# Newsletter

Vol 2 Edition 2 | Keeping you up to date with the latest agri-tech developments



FARM TECH  
CIRCLE

powered by the  AGRI CENTRE

## A journey through Newton Farm's cutting edge agri-tech innovations

Watch the  
video



Agri-EPI brought together farmers, tech developers and industry representatives for another successful farm walk at Newton Farm in Bannau Brycheiniog, Wales. Hosts and innovation farmers Richard, Helen and Tudor Roderick led a tour of their farm, and discussions were led by Dŵr Cymru Welsh Water, Nofence, Ritchie Agricultural and Smartbell.





## Innovative biodiversity monitoring at Hemsworth Farm

At Hemsworth Farm in Dorset, Agri-EPI along with AgriSound, Chirrup AI, Pollenize and Dorset Wildlife Trust, are conducting ground-breaking biodiversity trials.

Led by farmer Sophie Alexander, the team is part of an Innovate UK-funded project called “Biodiversity Monitoring 24/7.” Over 12 months, they have digitally monitored biodiversity to better understand the ecological engine that drives this farm and the agricultural sector as a whole.

In this video, you’ll learn about the importance of biodiversity for pollinators, integrated pest management, and crop yields. Discover how Hemsworth Farm established a baseline for biodiversity with the help of Dorset Wildlife Trust and how they are now using cutting-edge technology to monitor biodiversity in agriculture.

With biodiversity monitoring set to increase through the introduction of policies and schemes, it’s vital to assist ecologists with access to scalable remote technologies.

“We are part of an Innovate UK funded trial called Biodiversity Monitoring 24/7. We are going to be digitally monitoring biodiversity over 12 months. It’s really important to me on this farm because it’s the whole ecological engine.”

Sophie Alexander, Farmer, Hemsworth Farm

**HEMSWORTH**  
FARM<sub>LLP</sub>

Watch the video



## Tech on the vineyard

Ian Beecher Jones and Agri-EPI hosted a fantastic day at JoJo's Vineyard near Henley-on-Thames. There was a great turnout with many discussions shared around precision viticulture, data acquisition and application, and the future of agri-tech within viticulture and beyond.

Agri-EPI members Antobot and Outfield Technologies showcased their tech on the vineyard including Outfield's drone crop data system for fruit growers and Antobot's autonomous robot platform.

Thanks to everyone who came out, and stay tuned for our upcoming events.



Outfield Technologies crop data drone



Antobot's autonomous robot platform



## Funding opportunities

### Farming Equipment and Technology Fund Grants

The [Farming Equipment and Technology Fund](#) is part of the [Farming Investment Fund](#).

It offers grants for specific items of equipment to increase productivity, boost environmental sustainability and improve animal health and welfare.

Farmers, foresters and growers in England, including contractors to these sectors, can apply for a grant between £1,000 and £25,000. Grants go towards the cost of specific items from a prescribed list.

### Grants guidance

The [Farming Equipment and Technology Fund 2023](#) is split into 2 themes:

#### Productivity and Slurry grant

- > The items in this list improve agricultural sustainability and horticultural and forestry productivity, helping farmers use less inputs, reduce emissions and cut waste.

Find out more about this grant



#### Animal Health and Welfare grant

- > The items in this list offer improvements in the health and welfare of livestock, potentially helping farmers improve biosecurity or decrease environmental stress.

Find out more about this grant





- > Support from Agri-EPI Centre helps form partnerships and secure R&D funding
- > Facilities on-site key to development of new tech and validating data capture
- > Agri-EPI Centre network provides support throughout project

# Footbathing to treat lameness in dairy farming

## Background

Lameness is recognised as the primary animal welfare issue in dairy farming. Nationally, 25% of dairy cows are lame at any one time. Although it has multiple causes, the key factor in most herds is endemic diseases, such as digital dermatitis, sole ulcers, and white line disease. Early detection and prompt intervention is critical to effective control and treatment of lameness, which costs farmers in excess of £300 per case. Many hoof lesions, especially relating to digital dermatitis, are visible 1 prior to lameness developing but can be difficult to see in practice and require specialist training to diagnose.

The Hoofcount footbath was developed and introduced to the UK market in 2012. Designed with simplicity in mind, it now has a sustained reputation in the UK as the Market leader in Effective and Reliable Footbathing.



The UWE academic team collaborating on the Hoofcount project is led by Dr Wenhao Zhang of the Centre for Machine Vision. Wenhao's team are working on developing and integrating machine vision technology and AI software for hoof disease detection. Their aim is to realise algorithms, able to capture, filter, and analyse hoof images several times daily in a non-invasive way, to detect hoof issues in the earliest stages and to monitor for changes. Experiments and tests are being conducted in several UK dairy farms.

### **About Hoofcount**

Hoofcount, based in Lancashire, is a small family business that prides itself on their team full of hard working and dedicated individuals who are passionate about what they do. From accounts to service engineers, each one of them is responsible for the continued success of Hoofcount.

Their products include the Standard Hoof bath, the Excel Hoof bath, and the Robot Hoof bath, and they continue to collaborate with farmers across the world to improve their products.

Hoofcount Director and Dairy Engineer, Anthony Marsh, was shortlisted for the British Farming Awards 2021, Agri Innovator of the year, and the Hoofcount team won 2 awards in 2019 and 1 in 2021 at the BIBAS.

### **How Hoofcount is making a difference**

This project presents a unique set of challenges to machine vision and machine learning. Object detection and image classification 'in the wild' has always been considered a significant but fascinating challenge in the relevant literature. The solution to this has commonly been to increase data quantity, quality, and variability for machine learning. However, this is impractical for this project as it is unrealistic to manually capture and annotate millions of images containing a range of hoof issues with potentially subtle but highly variable visual appearance. Capturing data on working farms also presents us with unstructured environments and unpredictable behaviours of dairy cows, causing drastic changes in ambient illumination, presence

of water and contamination on the animals and our equipment, huge variations in animal gait, as well as random occlusions of features of interest. This requires that we develop techniques that are robust to all the variables we expect to encounter on the farm, and that are able to automatically collect and process image data efficiently, which will enable the machine learning models we develop to improve in performance over time.

### **How Agri-EPI has made a difference**

Agri-EPI Centre – Agricultural Engineering, Precision and Innovation – is part of the UK Government's Agri- Tech Strategy and aims to bridge the gap between industry and academia across the agri-food sector in the UK and globally. Agri-EPI Centre offers a host of benefits to businesses including access to cutting edge facilities, support for funding bids and investor finance and exclusive industry events.

Hoofcount's Anthony Marsh said being a member of Agri-EPI Centre has been a huge benefit in forming partnerships with UWE and in achieving a successful application for the Innovate UK project.

He said:

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“Utilising the Agri-EPI dairy centre and resources will give an excellent controlled centre for further development of the device with validated data capture.

When the project is completed the relationship with Agri-EPI and access to its wider network will be of huge benefit for realising the full potential of the commercialisation of the project.

Agri-EPI have been a pleasure to work with so far within this project and have successfully delivered on every aspect that we had anticipated.”

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**“Applying for funding and navigating our way through a project seemed extremely daunting for a small company. Agri-EPI guided us through the initial application and have supported us through the project keeping timings and communication all on target.”**

Anthony Marsh, Director, Hoofcount

# Climate change, food insecurity and the future of agri-food systems

The saying goes, “everyone needs a farmer three times a day, for breakfast, lunch and dinner”, but globally we are currently experiencing changes to climate resulting in disruption to food production and resulting food insecurity.

- > Widespread drought across the Americas from Canada to Chile, Central Asia, and Africa, resulting in reduction in crop quality, complete crop failures, and livestock deaths.
- > Excessive rainfall in areas such as New South Wales and parts of Europe where crops cannot be planted or are washed away.
- > Lack of snow in mountainous regions where lower lying land relies on snowmelt to feed irrigation networks. (Nature.com, 2021)
- > Wildfires in Greece, Italy, Tunisia, and Algeria (European Science Hub, 2023)

Add in the increasing demand for resources.

- > Water for domestic consumption, crop irrigation, and industry. (Drought conditions in areas such as the Panara River Basin in Brazil which serves multiple hydroelectric dams has also led to regional power rationing) (Nature.com, 2021).
- > Competition for land for agricultural production, housing, infrastructure as well as protecting habitat for the natural world.

Statistics also indicate that the ones who have contributed the least to climate change based on greenhouse gas emissions, are also the most vulnerable in society affected by these changes. E.g., several years of drought in Madagascar has resulted in 33% of the population (8.8 million people) being food insecure (IMF, 2023), surviving off a diet of insects and cactus leaves (BBC, 2021).

## Impacts on food security for the UK

The food and drink sector is the UK’s largest manufacturing industry, bigger than the aerospace and automotive industries combined. UK agri-food and seafood sectors create over £120 billion of value for the economy every year and employ over 4 million people (Gov.UK, 2022).

Professor Michael Fakhri, The United Nations Special Rapporteur on the Right to Food, said trade was the biggest vulnerability in the global food system, as in the last thirty years policies had been “geared towards prioritising food trade by any means possible” (House of Commons Environment, Food and Rural Affairs Committee, 2023).

Being part of a global food system can provide a diversity of supply sources and access to new products that cannot be produced domestically, contributing to domestic food security. However, exposure to international markets, in combination with global supply chain pressures and shocks, also creates price and supply impacts (Gov.UK, 2022). With approximately 48% of food consumed now being imported, compared to 78% in the mid-70’s, the UK as a nation is not food secure, this also hides a wide range of self-sufficiency levels sector by sector, e.g., the UK is only 17% self-sufficient in fresh fruit.

One of the changes that have been seen over that time frame is changing dietary habits, year-round supply of fresh fruit and salad, where we are not only importing food, but also water contained within that food from countries that can least afford it. Increasing consumption of rice with a large proportion imported from India and Pakistan and Vietnam (Volza.com, 2023). (The recent ban of rice exports from India due to extreme weather conditions and reported hoarding in other countries, there will be inevitable disruption of supply and price of this now staple foodstuff).

Navigating Food Shortages and Challenges in the UK’s Agri-Food Sector.

**Read the full article on our website:**

**Read the full article**

