Animal health and welfare: poultry projects

on the demonstration network

FARMING connect
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www.gov.wales/farmingconnect

Foreword

It is estimated that there are now over 350 egg producing holdings in Wales housing a total of 2.3 million birds. In response to consumer demand, free-range laying systems dominate the market, accounting for some 89% of production.

Chickens are the largest category of poultry raised for meat production, with fewer than 100 producers accounting for 90% of poultry produced in Wales. Between 2016 and 2017, the value of poultry meat in Wales was £45 million and the value of eggs was £52 million.

The margins associated with poultry meat and egg production can be tight which is why good cost control is essential in order to remain profitable. Farming Connect provides support to this important sector of the farming industry to help improve animal health and welfare standards, manage and control disease, optimise production, minimise costs and encourage responsible utilisation of by-products from the sector through for example, energy and poultry manure.

This booklet provides a brief snapshot of some of the animal health and welfare projects that have taken place at a small selection of Farming Connect focus farms during the past three years. They highlight how poultry farmers participating in this initiative have benefited from introducing more efficient systems which have led to positive outcomes, with improved regimes now in place. Topics and issues addressed include implementing stringent biosecurity measures to reduce the risks of disease to controlling red mites and achieving optimum husbandry, housing and nutritional regimes.

Each farmer you read about has been encouraged to utilise new technologies which are helping them reduce costs, meet customer requirements and ensure labour resources are optimised. With support and guidance from some of the UK's leading poultry specialists, they are 'achieving more from less', building sustainable egg and poultry meat systems which are fit for the future.

For updates on projects and trials at all the sites in the Farming Connect demonstration network, visit our website at **www.gov.wales/farmingconnect**

The projects also illustrate the importance of working with your vet to ensure advice is bespoke to your animals and farming system. Developing an animal health plan in conjunction with your vet is an essential part of managing any livestock enterprise. In addition, you can refer to the animal welfare codes of practice which can be found at **www.gov.wales/animal-welfare**

Dewi Hughes
Technical Development Manager, Farming Connect
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Farming Connect - helping you drive your business forward

Eligible businesses registered with Farming Connect can tap into a wide range of Farming Connect support services, guidance and training.

Many services are fully funded, others are subsidised by up to 80%.

Visit our website to find out how you can:

- benefit from subsidised business support, tailored to your business needs
- reduce outputs and increase efficiency across all areas of your business
- benchmark your performance and work towards progress and growth
- identify areas for improvement and find solutions to problems
- develop your skills as part of our continuing professional development/lifelong learning programme
- keep up to date with the latest innovations in technology through industry developments and the latest research projects
- share best practice and benefit from the knowledge of other farmers, industry experts and academic research
- be inspired by new ideas and find more efficient and innovative ways of working

The fertiliser value of home-produced poultry manures

The poultry industry in Wales has expanded significantly in recent years and as a result poultry manure is more widely available. It is rich in nitrogen, phosphate, potash and trace elements (sodium, iron, manganese, zinc, copper, calcium) and can improve the physical and biological properties of the soil for agricultural production, but only if applied correctly.

In addition, the biosecurity risks associated with using poultry, or indeed any manure must also be considered. Care must be taken to ensure land used for spreading these manures are not accessed by other poultry flocks. It is also important to consider the risk from wild bird populations particularly if the fields where these manures are spread or stored are accessed by large gatherings of wild birds. Manures should be appropriately composted prior to use to increase the chance of killing pathogenic bacteria. Manures from poultry units that have experienced disease outbreaks will need to be managed differently and further guidance on this should be sought before spreading these manures.

With the increase in poultry manure availability, nutrient management planning is essential to prevent the over application of nutrients, protect water quality and minimise impact on the environment while still providing optimum yield for business benefit.

Lower Eyton focus farm near Wrexham worked with Farming Connect in 2018 to investigate how farmers can make best use of their home produced fertilisers. The farm includes arable land, a beef herd and a 5,000 free range poultry unit. As well as producing its own poultry and beef manure, the farm also has access to sewage sludge. The farm is currently not in a Nitrate Vulnerable Zone (NVZ); however, it is regarded as 'nitrate sensitive', and wanted to manage highly nutritive animal fertilisers carefully whilst optimising production safely.

Project aims

To assess crop requirements, soil status, and match this to available nutrients from home produced fertiliser.

To develop a tailored approach to nutrient management, topping up with purchased fertiliser only when required, rather than using routinely.

Project results

Value of home produced cattle farmyard manure (FYM) - **£4,580**

Value of home produced poultry FYM **£1,019** from **5,000** birds

Farm soil indices targets:

pH - 6.0

P - Index 2

K - 2-

- Lime was required for 19 of the 35 fields assessed due to a low pH level
- There was a risk of diffuse pollution due to high nutrient indexes present in the soils
- Two fields had phosphate indexes of 4 therefore to lower these the farm should avoid P applications to these fields

The value of nutrient management planning:

Take a **field by field** approach when looking to maintain and improve soil nutrient status to optimise farm productivity

Analyse soil pH, N, P, K and Mg every 3-4 years

Poultry manure uses

- A valuable nutrient applied to grassland or arable land
- Used for electricity production producing ash which can be used as a phosphate and potash rich fertiliser
- Used to produce biochar, a soil conditioner, that can be applied to crops such as beans and maize as a fertiliser
- As a compost

Key project messages

- Use urea fertiliser in the spring if required, when temperatures are low with little volatilisation. Using outside this period will result in risk of leaching into the wider ecosystem and a cost without return on investment
- Maintain an on-going field record of manure used
- Re-directing organic manures to lower index fields will help to balance soil nutrient levels
- Target spring applications of organic manure where possible to maximise the available N for increased crop growth

Always

- Ensure there is no run-off
- Prepare and follow a manure management plan and a nutrient management plan
- Limit application to no more than 250kg of total N per ha per year. (This does not include manure deposited from grazing animals)
- Check waterways frequently, during and after spreading
- Leave at least three weeks between applications to avoid surface sealing and to allow the soil time to absorb the nutrients

Never

- Apply when run-off to a waterway is likely to occur
- Allow silage effluent, slurry, poultry manure or fouled water to enter a waterway
- Apply liquid organic materials when heavy rain is forecast within 48 hours - rainwater that runs off fields that have recently been spread with slurry may also cause pollution
- Apply more than 50m³ (50t) per ha in any one application
- Apply to land that is flooded or likely to become flooded

Using technology to improve business efficiency and health & safety

Technology has a major role to play in the farming sector. New technology is continuously being developed in the industry to help increase the efficiency. The poultry industry is regarded as an advocate of new technology, being able to put systems to use in controlled environments. Genau Hafod, a Farming Connect Focus farm near Newtown, houses 42,000 layers, alongside its beef and sheep unit. Approximately 40,000 eggs are collected daily which are then packed in a central packing room located in their original chicken shed. The four-person team on-farm realised that savings could be made if new automated technology was introduced to aspects of their production system. Working with Farming Connect the business trialled an egg palletising robot, to increase business efficiency.

Project results

Financial saving over **5** years
£34,264

Example cost of an egg palletising robot:
£30,000

Annual Saving **£6,853**

Robot will have paid for itself in **4** years

2.5 hours saved daily

Farmer conclusions: 'The robot makes it easy for one person to collect the eggs, allowing for daily tasks to be completed quickly and efficiently. It also means that we are not reliant on each other and do not rush other poultry management duties'.

Key messages

Why introduce an automatic egg palletiser?

Improvements across the entire enterprise

- Indirectly impacted on egg production. More time available for bird husbandry tasks, reducing deaths and welfare

Improvements made to staff welfare and health and safety standards

- Reduced repetitive workload of staff
- Likely to reduce cases of repetitive strain and long term damage caused by working conditions
- Reduced time spent lifting heavy and awkward objects

Increased flexibility has improved resource efficiency, and rapid cost savings

- Better use of workforce, as packing now only requires one person, allowing the other to perform separate tasks
- Daily jobs completed quicker and more efficiently
- Time, effort and financial savings

Meeting processors' preferences

- Following processors' preferred packing methodology helps retain contracts

Trialling environmental mapping sensors in broiler units

Effectively managing environmental conditions in meat poultry rearing sheds will help reduce the total cost of production. The goal is to provide an environment which maximises flock performance, achieves optimum and uniform growth rates and high feed efficiency, while also ensuring that bird health and welfare standards are not compromised.

Farming Connect trialled a wireless sensor system to remotely monitor temperature and humidity on a focus farm in North Wales. The data collected provided a real time visual indication of temperature and humidity challenges within the poultry house. Live maps created could then be used to inform management decisions, including:

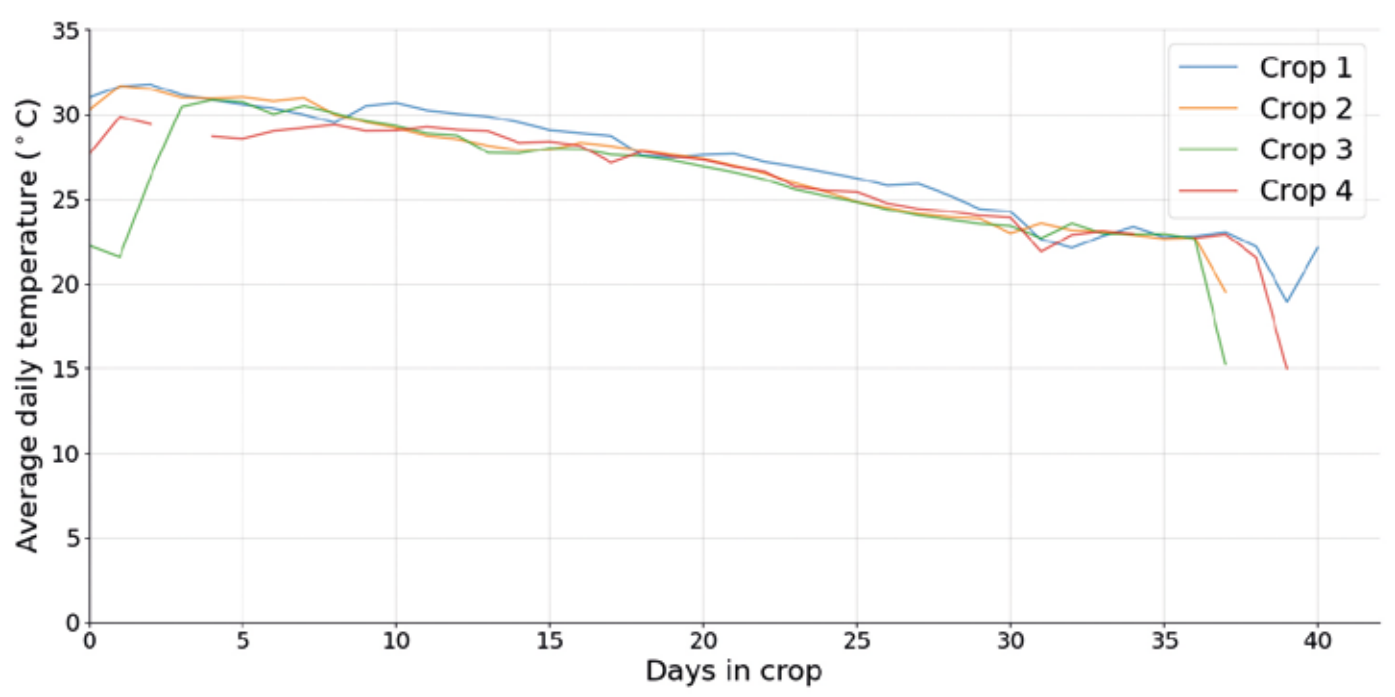
- Monitoring temperature and humidity in real time
- Adjustments to ventilation according to humidity levels
- Adjusting feed according to environmental temperature
- Taking preventative action by adapting and improving ventilation and housing design
- Detection of humidity build-up due to damp bedding, poor drainage or humid weather

Project results

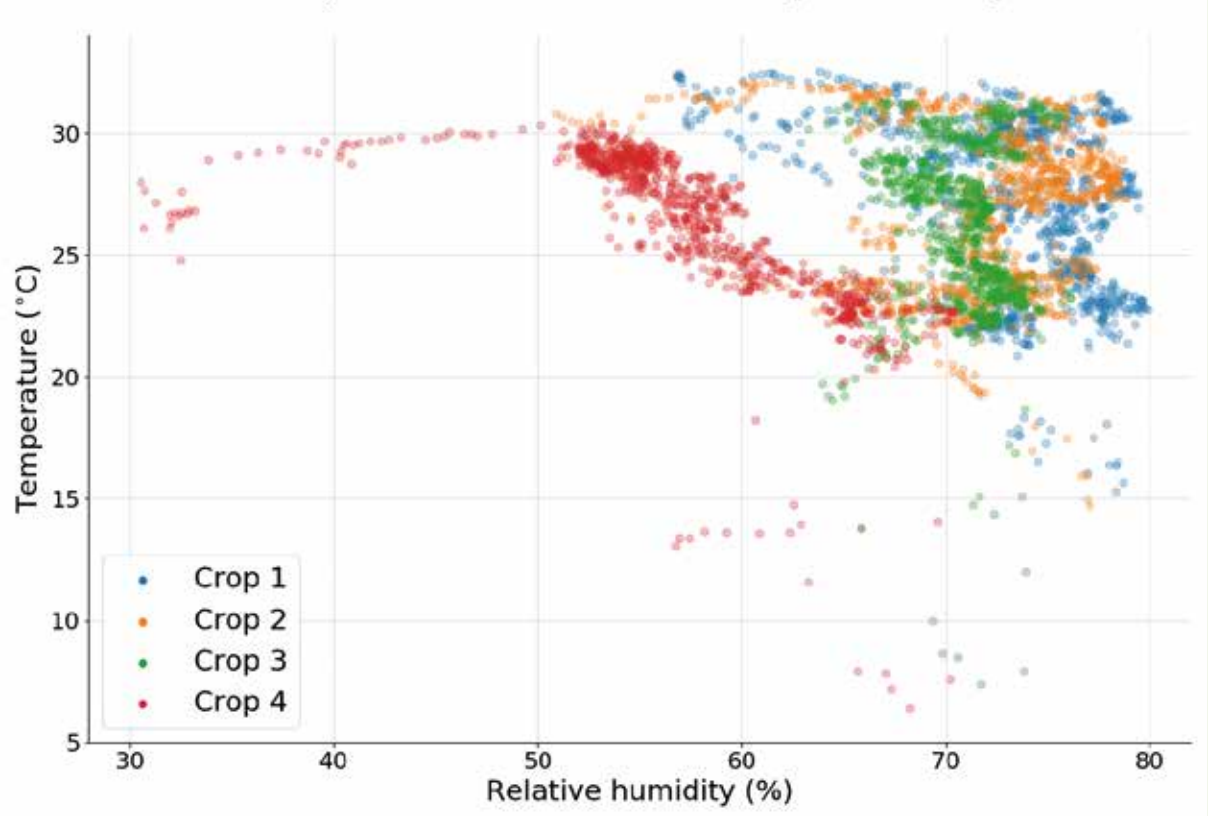
- The PrognostiX sensors showed that temperature and humidity were not uniform at bird level throughout the shed
- The environmental heat map indicated the areas of the building where the temperature and relative humidity were sub-optimal, highlighting where improvements were needed, in order to ensure bird growth in each production crop cycle was maximised and uniform

Visual detail provided by the sensor technology

Average daily temperature over four crops

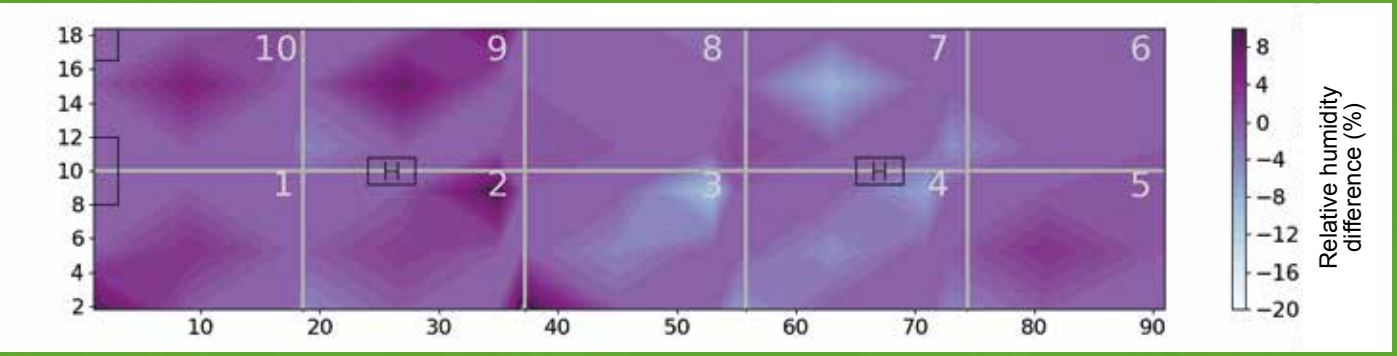


Temperature vs relative humidity over four crops

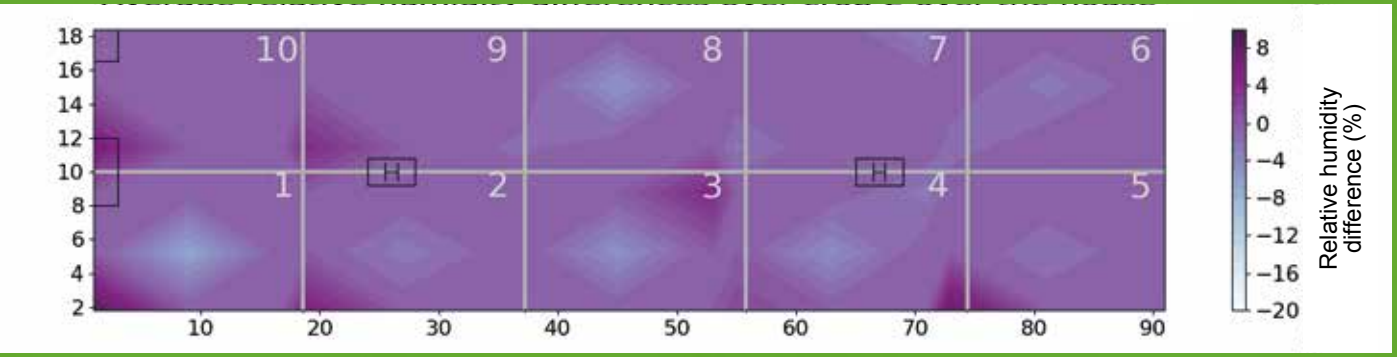


Relative humidity variation over the house, averaged over each crop

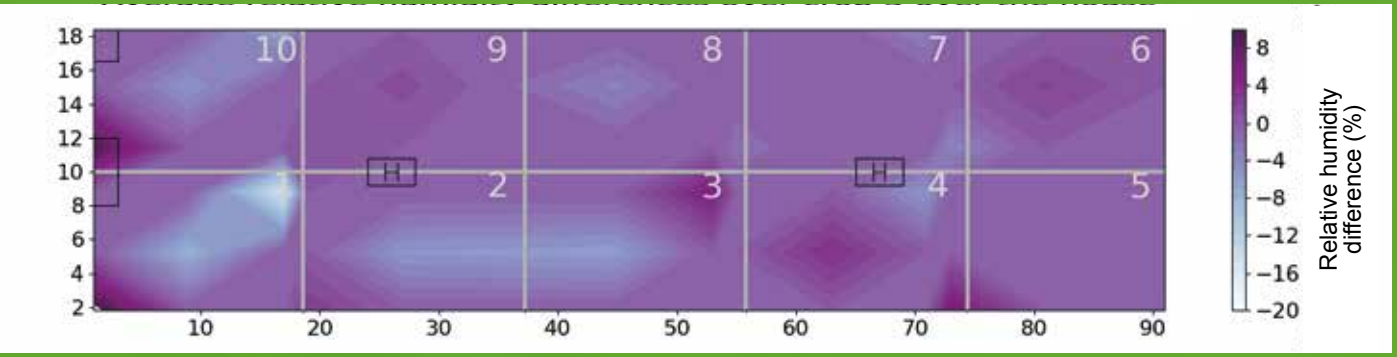
Average relative humidity differences over crop 1 over the house



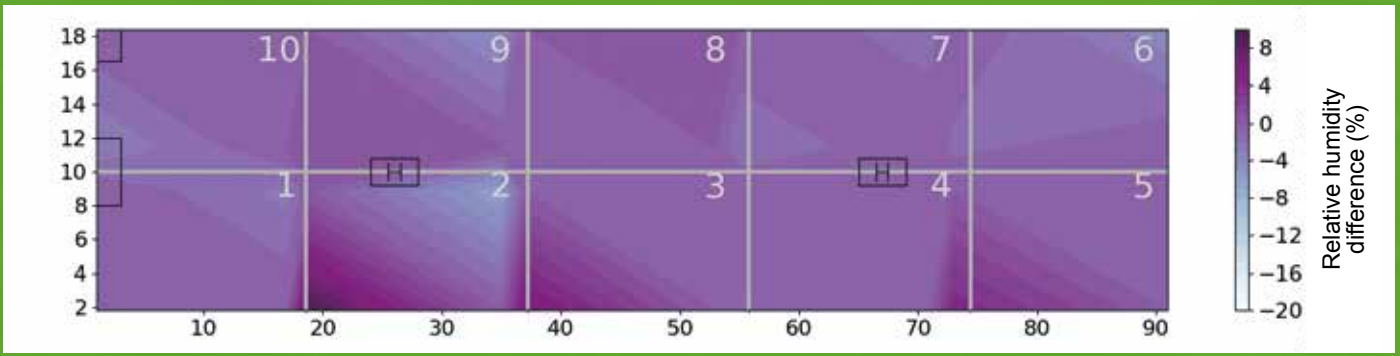
Average relative humidity differences over crop 2 over the house



Average relative humidity differences over crop 3 over the house



Average relative humidity differences over crop 4 over the house



Key messages

- Effective management of environmental conditions within poultry housing will reduce total cost of production
- Ammonia is one of the most common air quality problems, leading to bird health problems and lowered performance. Correct ventilation reduces the risk of ammonia build up, by controlling the relative humidity in the building
- Provide a uniform in-house environment for the birds; pockets of dead air, cold spots or hot spots can lower flock performance and can increase flock mortality

Improving energy efficiency in intensive poultry units

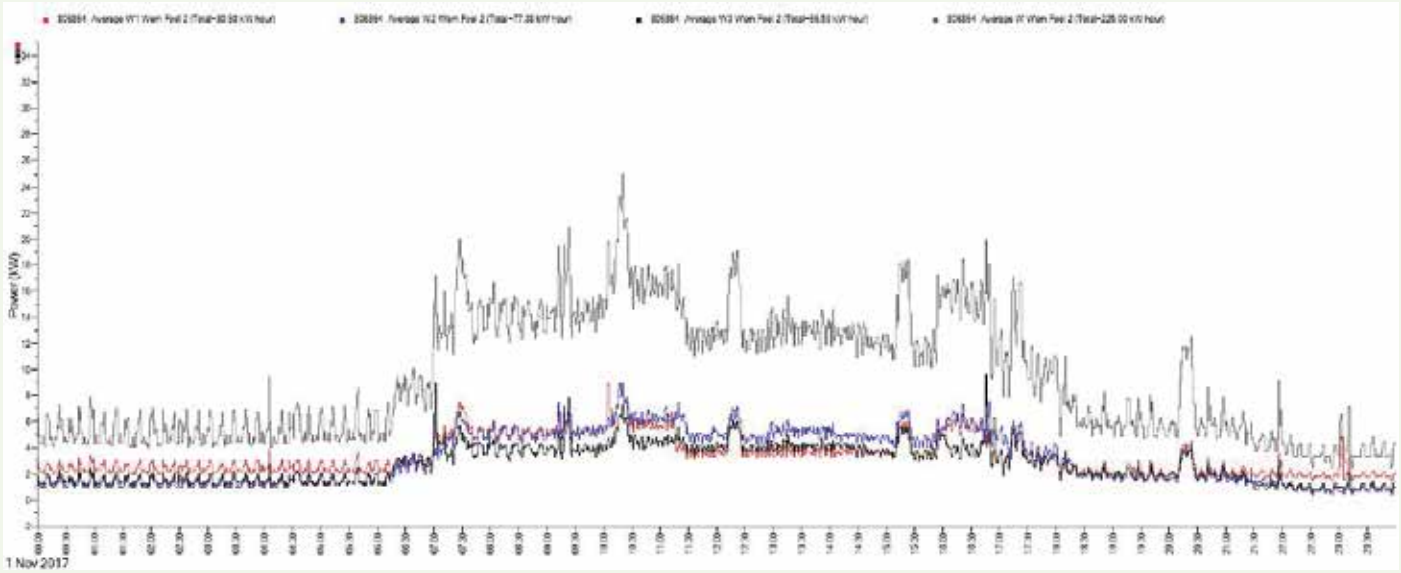
The large energy requirement for heating, ventilating, lighting and feeding in poultry units results in high energy costs. Simple energy efficiency measures can lead to significant savings, particularly on older buildings. If site electricity usage is better understood then measures can be put in place to reduce future energy requirements, leading to lower costs and greenhouse gas emissions.

Energy consumption was evaluated at Wern focus farm, near Welshpool in 2017, on its 32,000 poultry unit. An energy audit was carried out using Rogowski coils which were wrapped around each of the cables supplying the main distribution board, connected to a data logger.

The energy consumption was recorded over six days, monitoring the unit on a 24hr basis. The audits showed the energy requirements throughout the usual working day and when energy demand was at its greatest, giving an understanding of the energy requirements of daily tasks. Energy load distribution was also investigated. The project highlighted ideas and best practice which can be considered by other intensive poultry systems across Wales.

The graph below shows the energy demand over a 24 hour period. The graph indicates the energy requirement throughout the usual working day and when energy demand is at its greatest.

Energy demand over 24 hr period



Key messages

Ensuring that you have a competitive electricity supply contract is the basis of cost limitation.

Energy cost at Wern

28 pence per bird/year (in **2017**)

This is considered mid to high range for sheds of **32,000** birds

Balancing load management

Load management can influence supply of power at a constant voltage and therefore it is important where possible to balance energy demand evenly across the load.

How to save on energy costs

- Obtain supply quotes from several energy suppliers and compare the cost per unit
- Negotiate on multi rate energy tariffs
- Good electricity hygiene will ensure that wastage is minimised. *For example: switching lights and machines which are not in use off and at a more advanced level consider a reduction of the run time of motors and feed belts within the unit*
- Consider the lighting within the building. *Consider changing from standard fluorescent lighting to LED which would reduce the energy consumption*
- Optimise thermostat setting and ensure they are working correctly. *This will ensure ventilation fan costs are minimised; as these can be a significant proportion of electricity consumption during summer months*

Controlling red mites in laying units

Red mites, *Dermanyssus gallinae*, are seen throughout the poultry industry and thrive on the living conditions within poultry systems. Red mites are known to increase rates of anaemia, mortality and disease susceptibility and also negatively influence business profitability affecting feed efficiency, egg production, egg quality and bird weight gain.

Farming Connect worked with Osian Williams from Wern focus farm assessing the extent of their red mite situation. The project explored the use of the Exzolt product as a control method for red mite populations in the layer unit. Exzolt is administered through the drinking water, and the active ingredient, fluralaner, is absorbed by the gut and enters the bird's bloodstream. The red mite's nervous system initially becomes affected after a blood meal from a treated bird. Death of the mite occurs soon afterwards with a kill rate of up to 99%.

The assessment was made using the AviVet red mite diagnostic systems where red mite traps are strategically placed along areas with the highest level of bird 'traffic'. After 48 hours the traps

were collected, frozen and weighed before a vet assessed whether there was a requirement to prescribe Exzolt to the flock. Flock information and performance records were collected post treatment, to assess whether the birds reacted to the product and consider its potential impact on production.

The aim of the project was to find a financially viable and effective way to control red mites in poultry layer units.

Economic impact of red mites to the industry

Consequences of red mite infestation to production

- Negative effect on general health and welfare
- Negative impact on feed conversion ratio
- Drop in egg production
- Increase in downgraded eggs
- Higher susceptibility to poultry diseases
- Increased losses

The potential losses in an example 16,000 bird unit

10% drop in output

↓

11,200 egg reduction weekly

↓

Loss of £3,136/month

Losses associated with mites cost the European poultry industry **£322** million/year

Mite densities range from **25,000 - 500,000** mites/hen

83% of European poultry farms suffer from red mite infestations

Controlling red mites in laying units

Mite induced health problems

- 3% loss of blood volume every night
- Increased stress levels
- Increased pain and skin irritation
- Aggressive feather-pecking
- Cannibalistic behaviour
- Increased feed and water intake
- Increased vulnerability to disease

How can red mites be controlled?

- Housing design
- Flock and environmental management
- Understand the products you are using
- Enforce strict biosecurity measures
- Ensure thorough clean out procedures are in place
- Work with a vet to include red mites in the flock health plan

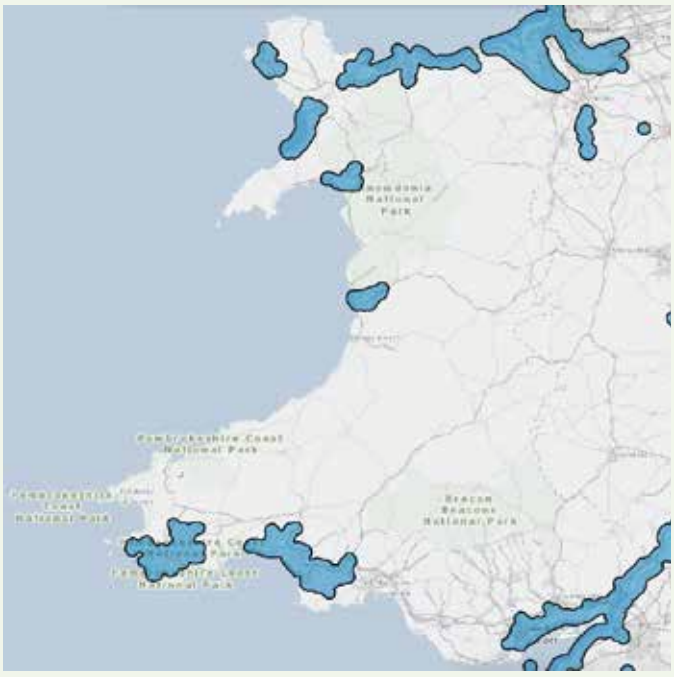
Prevention of avian influenza (Bird flu)

What is avian influenza?

Avian influenza occurs naturally in bird populations worldwide and can infect domestic poultry and other bird and animal species. Avian flu viruses do not normally infect humans. However, sporadic human infections with avian flu viruses have occurred.

Infected birds can shed avian influenza viruses in their saliva, nasal secretion and faeces. Susceptible birds become infected when they have contact with the virus as it is shed by infected birds. They also can become infected through contact with surfaces contaminated with virus from infected birds.

There is a constant risk of bird flu in the UK from wild birds. As it is highly contagious, take action to protect your birds from catching it.



Symptoms

- Swollen head
- Blue discolouration of neck and throat
- Loss of appetite
- Respiratory distress such as; gaping beak, coughing, sneezing, gurgling and rattling
- Diarrhoea
- Fewer eggs laid
- Increased mortality

Higher risk areas (HRAs)

All areas in the UK remain at risk of bird flu in wild birds.

There are a number of areas defined as HRAs. These are generally areas near where wild birds gather, such as lakes, marshes and estuaries.

Practise good biosecurity:

- Minimising movement in and out of bird enclosures
- Clean footwear before and after visiting birds, using APHA approved disinfectant
- Minimise different vehicles and equipment that come into contact with birds by having dedicated equipment
- Clean and disinfect vehicles and equipment which have come into contact with poultry
- Keep areas where birds live clean and tidy and regularly disinfect hard surfaces such as paths and walkways
- Humanely control rats and mice
- Place birds' food and water in fully enclosed areas protected from wild birds and remove any spilled feed regularly
- Avoid keeping ducks and geese with other poultry species
- Consider the wider environmental layout and location of sheds. Avoid places where there could be conflict with wild bird populations
- Keep a close watch on birds for any signs of disease and report any sick birds or unexplained deaths to your vet

If you suspect any type of bird flu in poultry you must report it immediately by calling your local Animal and Plant Health Agency (APHA) office immediately on **0300 303 8268**. APHA vets will investigate suspected cases.

Anyone who finds dead wild birds should report them to the Defra helpline **03459 33 55 77**.

Farming Connect

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