LIVESTOCK

August 2022 – December 2022

FARMING connect
cyswllt FFERMIO

Demonstration Network

Exploring optimal environment conditions for free-range laying hens to increase bird health, productivity and profitability – Wern demonstration site

The main aim of the project is to provide a healthier environment for hens by introducing non-infective bacteria into poultry sheds. The objective of this is to reduce the use of antibiotics and also improve the production and performance of the flock.

Sensors were installed into the sheds (Figure 1), monitoring internal ammonia, carbon dioxide, temperature and humidity, with external weather conditions collected from a local weather station also displayed on the dashboard. The sensors connect via a LoRaWAN gateway and data readings are taken every 10 minutes and displayed on an online dashboard.

Figure 1. Sensor unit installed in Wern poultry shed.

Initial swabs taken in May 2020 showed a dominance of streptococcus and E.coli. These bacteria put pressure on the immune system of the birds and increase infection pressure. The project aimed to reduce the numbers of these harmful bacteria and create a healthier environment for the birds. It is common to have a dominance of these bacteria in industrialised agriculture buildings.

The initial swabs taken at Wern lacked the presence of beneficial bacteria, similar to soil bacteria – this is often typical of industrialised livestock buildings where animals have been brought inside sheds and there is a build-up of faeces. Therefore, throughout the project, beneficial bacteria were introduced into the sheds and water lines to reduce the dominance of the disease-causing bacteria.

Results from the project showed an increase in feed consumption whilst mortality rates decreased. Project results also showed an increase in egg weights and kilograms of eggs produced per bird post-treatment in comparison to pre-treatment.

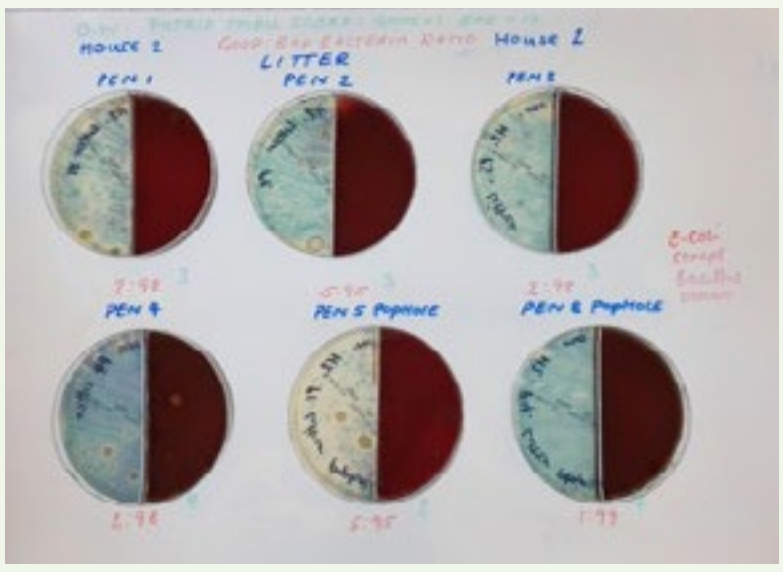

Figure 2. Initial swab results for bacteria presence in Wern poultry shed.

Other key results for the project include:

- Air quality improved in the sheds with low levels of ammonia maintained for longer periods
- Moisture content in the litter reduced by over 50%
- Mortality was reduced as flock health improved and no antibiotics were required throughout the trial
- Shed environment was optimised, meaning the birds needed less energy to stay warm and could put more energy into production and the overall amount of bought-in feed reduced
- Profit margins increased

Calf Decision Tree – Parc y Morfa focus site

A core element of successful livestock farming is the rearing and health of youngstock, they are the future of the business. Poorly reared, unhealthy youngstock cost greatly in terms of poor future production, increased veterinary costs and higher mortality rates.

Following a visit by vet Kathryn Hart, who has been advising Rhys Williams at Parc Y Morfa, a range of protocols, and factsheets were created for each and every disease as well as the decision tree (figure 4). This pulled together all the other sheets prepared and give an easy, step by step guide of how to go through a calf assessment on-farm and give appropriate medicine.

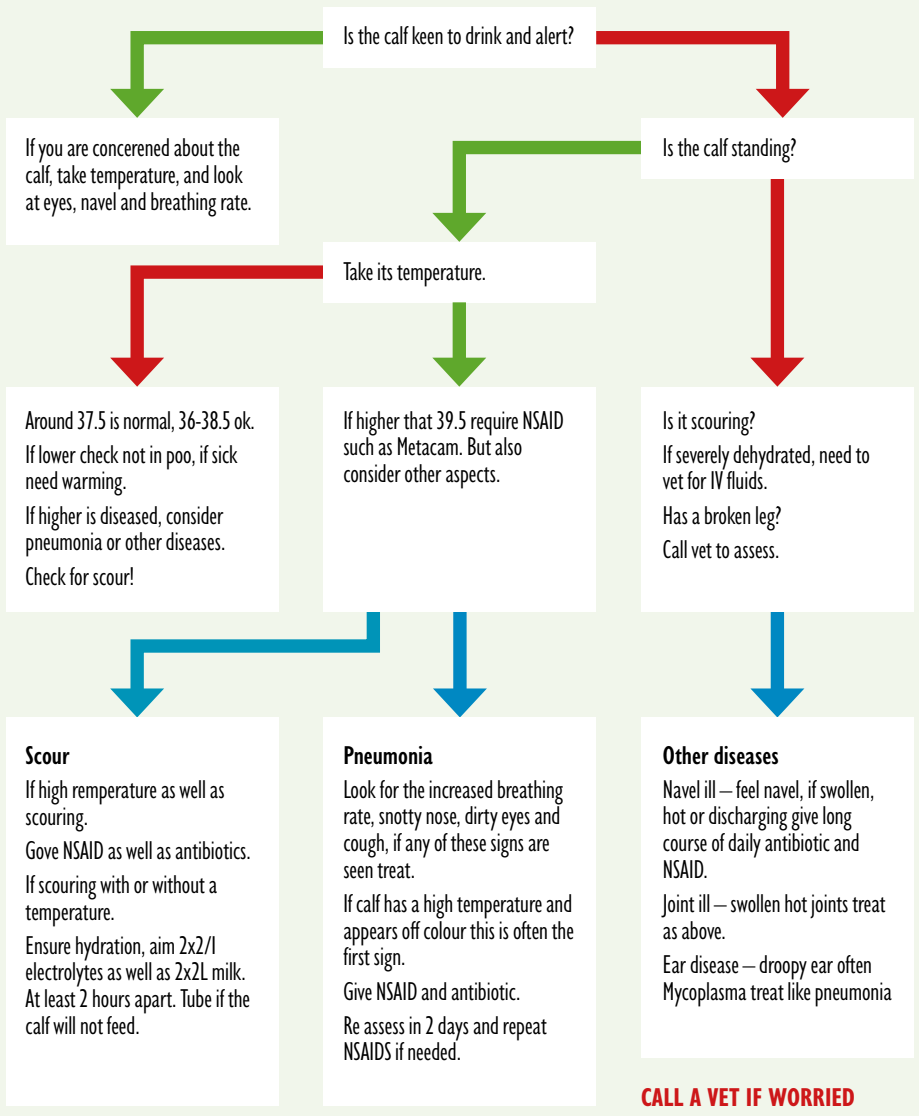

Figure 3. Calf management decision tree.

On-farm antibiotic use is under continual scrutiny by milk contracts and farm assessors. Calf use is often low due to the size of the animals, however, when given when not required or when given inappropriately, this can lead to increasing cost and risk of antibiotic resistance.

Due to the importance of recording data on calves, a recording sheet was also created to allow for all aspects of calf health to be recorded. This covered stillbirth, birth weights, weaning weight etc therefore grain per day could be calculated. Also, data about treatments with the date and reason for treating was being recorded.

30% of pneumonia treatments were being recorded within 14 days following a scour treatment. Nutrition was highlighted as an area to improve as milk machine-fed calves seemed worse off. This is often due to the large group sizes. The decision was made for all the autumn block to be fed by hand with a teated bucket system i.e. a 3.5 litre twice a day method.

Spring 2022, after a deep clean of the calf facilities, saw much lower level of scour disease. Due to this, no preventive drench was required. Nutrition was also much improved therefore it is hopeed there is higher resilience and immunity. However, the numbers of calves treated for pneumonia were still high. With the current shared air space with adult cows, putting in a strong vaccination policy is tricky, however, this would be the next stage for the farmer to look into.

Investigating the feasibility of establishing a bull beef enterprise – Bryn demonstration site

Being in a high-risk TB area, Bryn Farm wanted to investigate the feasibility of a bull beef finishing enterprise which will help mitigate some of the damaging effects if the herd was to test positive. Previously, they would sell surplus stock as stores, but having an arable operation on-farm lends well to having low-cost feed, compared to buying in, and straw available. With many farm models, cashflow is often concentrated at particular times of the year; establishing a new enterprise at Bryn would generate a new income stream and help spread income across the year.

At weaning, the top bulls sired by Charolais bull were identified on daily liveweight gain and kept entire. Huw discussed with a nutritionist the best blend to complement the rolled barley grown on farm; he was advised to feed 70/30 Barley:Blend = 2.33t Barley + 1t Blend Mixed. Bulls were housed and introduced to the bull beef ration in January at around eight months old. They were given a daily allocation of feed, building gradually to ad-lib, fed through a 3-in-1 feeder, with free access to straw and clean water. Bulls were weighed twice a month on average. After reaching a target liveweight of 600kg, bulls were sent to slaughter at ABP.

Year	2020	2021	2022	Industry targets
Number of bulls	15	15	15	15
Inputs and costs	Blend 6t @£239/t Rolled Barley 12t @ £130/t Straw £75/t	Blend 9t @ £270/t Rolled Barley 16t @ £184.5/t Straw £105/t	Blend 9t @ £329/t Rolled Barley 18t @ £209/t Straw £70/t	n/a
Average age at slaughter (months)	13	13	14	12-14
Av liveweight at slaughter (kg)	620	595	604	630
Av carcase wgt (kg)	344	340	345	360
Killing-out percentage	55	57	57	57
Av grade	R2	R3	R2	n/a
Average total value/head (£)	1,038	1,366	1,529	n/a
Av p/kg	316	401	443	n/a
Av DLWG on Bull beef ration (kg/d)	2.4	2.5	2.2	n/a

Table 1. Performance figure of bull beef enterprise over 3 years.

Year on year, the performance of the bulls remained very similar, achieving an average DLWG of 2.4kg. For the 52-bull part of this project, the average total value per head was £1,311. The cost of inputs was less at the Bryn Farm, as they could make use of barley and straw from the arable enterprise.

Advisory Service

Number of businesses who have received support through the Livestock Categories of the Advisory Service during this period:

6 individuals received one-to-one support through the Livestock Categories of the Advisory Service during this period.

30 groups made up of **109** individuals received support through the Livestock Categories of the Advisory Service during this period.

Feedback from businesses on delivery of this Advisory service:

"We're bolusing the ewes today and have ordered buckets for the lambs. It is really obvious that the ones that have not been on the creep don't look well and now we think we know why. Very pleased with this service."

"I feel the labour force benefited greatly from the milk sure course."

Webinars and Events (relevant to the Livestock theme)

24 WEBINARS AND EVENTS held with **325** VIEWERS OR ATTENDEES

Examples of webinars held include:

- Transition cow management
- Sheepdog handling demonstration

Knowledge Exchange Hub

The following technical articles have been produced by the KE Hub:

- SEAWEED IN AGRICULTURE
- READY, STEADY, SLOW! SLOW-GROWING BROILERS ARE HEALTHIER AND HAVE MORE POSITIVE WELFARE
- CIRCULAR SYSTEMS IN AGRICULTURE PART 1: LIVESTOCK PRODUCTION SUSTAINABILITY

Discussion Groups

112 DISCUSSION GROUP MEETINGS held with **664** ATTENDEES

During this period, both Pembrokeshire based sheep discussion groups chose to undertake a series of meetings with Phillipa Page of Flock Health

The first meeting targeted lameness and its effect on flock productivity and profitability. Discussions included the current percentage of lameness and its impact on the flock, the industry five-point plan for lameness and the importance of working in all five areas to ensure an effective lameness management strategy. Focus was given to all five areas with members considering whether lameness was decreasing in their flocks and, if it wasn't, encouragement was given to try to pinpoint areas that weren't working effectively.

The second meeting focused on preparation for lambing and how dealing with issues such as liver fluke, iceberg diseases and ewe body condition score will help. The groups discussed when fluke was treated and what products were used, the importance of checking the fluke forecast and testing before treating, the fluke cycle and how to break it, along with remembering pasture protection, stock protection and farm protection. Focus then switched to body condition and finding out why ewes are thin. Many causes and treatments were discussed, but it was highlighted that iceberg diseases are more difficult to treat because their symptoms can be confused with other illnesses and there are few accurate tests. The groups were urged to raise their awareness of iceberg diseases and to consider adopting a stringent culling policy if detected.

The final meeting of the series were titled "KISS – Keep, improve, start, stop". They began with an ewe nutrition quiz, with questions based on what we feed sheep, how they process food, the role of the rumen and the importance of energy and protein in performance. This got everyone thinking about nutrition before lambing and the importance of allocating correct rations to feed the rumen and ensure better ewe performance. Members then reflected on all three meetings and applied the KISS model. All had similar ideas, with many comments mentioned more than once. The outcomes of discussions were to:

Keep – FEC testing, monitoring worms, body condition scoring, testing colostrum, farming as best as we can

Improve – lameness, FEC knowledge, nutrition knowledge, worming and fluke knowledge

Start – separating lame sheep from main flock, tupping earlier, FEC testing, culling lame ewes, analysing forage

Stop – unnecessary foot trimming, using concentrate.

Clinics

200 CLINICS TOOK PLACE DURING THIS PERIOD

33 of these clinics were Animal Health and Nutrition clinics with **149** businesses benefitting from them.

These clinics worked alongside a business's local vet, looking at various health problems they have within herds and flocks and aiming to treat and eradicate these.

Some of the topics looked at were:

Fluke, FEC, trace elements, fertility as well as blood testing and post-mortem to diagnose the issues within flocks and herds.

Animal health & welfare workshops

50 WORKSHOPS held with **672** ATTENDEES

Examples of workshops held:

- Antibiotic resistance
- Bovine Viral Diarrhoea (BVD)
- Bovine TB
- Flock Fertility Management
- Improving Post Weaning Lamb Performance
- Parasite Control in Cattle
- Reducing Lameness in Dairy Cattle
- Maximising Suckler Cow Productivity
- Sheep Lameness
- Understanding Johne's Disease
- Youngstock Health

Training Courses

The most popular courses in the period were:

Course Name	Number of individuals trained during this period
Cattle Foot Trimming	42
DIY AI	32
Cattle Scanning	19
Safe Use of Vet & Med	18
Cattle Mobility Scoring	16

E-learning

Some of the e-learning courses completed within this period include:

- SHEEP LAMENESS
- BODY CONDITION SCORING
- MASTITIS IN CATTLE
- GENETIC IMPROVEMENTS OF LIVESTOCK

Click here to visit the website.

Where have ewe moo-ved to? Trialling the use of tracking technology in extensive grazing systems

As part of the project, six farmers from across Wales have trialled the use of GPS tracking collars to help manage their sheep and cattle grazing on mountains and conservation land. In both 2020 and 2021, the farmers tested the collars, by Digitanimal, on three grazing environments during their primary grazing season, roughly February to May.

These grazing environments were:

- Brecon Beacons National Park – a common on the Black Mountain
- Anglesey Fenlands, Anglesey
- Kenfig Dunes, Bridgend, Glamorgan

Farmer feedback and results

Sheep and cattle location

The ability to locate cattle and sheep across different extensive environments was of significant benefit to the participants. The real-time location meant that farmers knew where their animals were every half an hour. It allowed them to gather information such as movement, distance travelled and grazing patterns on an individual level as well as gain a specific understanding of the general grazing habits of their livestock. Farmers received notifications when animals exceeded farm limits due to the ease of accessing the information via a mobile phone application or website, reducing stress on the farmer.

Figure 4. Notifications and information issued via mobile phone application.

Figure 5. GPS Tracking collars placed on ewes.

Environmental schemes

This project helped demonstrate that livestock tracking can allow for improved control of ecosystem services, resulting in a better understanding of how to improve the ecosystem service offer associated with upland and fenland management, using technology. Heat maps were able to be generated from the data which could be used by farmers collaborating with conservation bodies to assess habitat management and work together to ensure grazing and vegetation management is sustainable for all concerned.

Figure 6. Heat map of sheep grazing on the Black Mountains, generated by Digitanimal.

Reducing farm labour costs

Three of the project participants were of the opinion the tracking system helped the gathering on the Black Mountains to be more efficient and less stressful for both farmer and the livestock. Furthermore, when checking on livestock on a daily or weekly basis, the tracking technology helped to locate the livestock in a large open area. This reduced the labour time for one of the farmers by one hour per week.

For the other three project farmers, they felt that the technology had not allowed them to make a saving in labour costs, due to the time associated with maintaining/working with the tech itself.

Livestock theft

The collars and trackers, which are worn around the neck of the animal, operate as a deterrent to theft. The collars can also alert farmers if livestock are being gathered at unusual times, however the accuracy of the data would need to be increased to achieve this successfully.

Tackling health issues

The technology also helped farmers to identify sick or injured animals, through lack of movement, which reduced the time and cost of treatment and loss in productivity as cases were identified more rapidly.

Future adoption of the technology

The cost of the equipment remains the biggest barrier to adoption, with reference to the sheep sector in particular, with farmers unable to justify the purchase because the current price of the product is prohibitive for the farmer. At the time of this project, the tracking collars from Digitanimal were £120 each, and the associated antenna was over £500.

Conclusion

Overall, the project has shown that this technology sits well in the livestock industry, providing benefits to both the farmer and the environment. Further work is needed to reduce the cost of the product, improve the connectivity, tracker accuracy, the overall user interface, robustness of the product and increase the level of information it can provide to a farmer. All this would help the industry not only see the theoretical value of the technology to a farmer but be more likely to trial and then adopt it for use across their livestock system.

Cronfa Amaethyddol Ewrop ar gyfer Datblygu Gwledig: Ewrop yn Buddsoddi mewn Ardaloedd Gwledig
European Agricultural Fund for Rural Development: Europe Investing in Rural Areas
Llywodraeth Cymru Welsh Government