

Animal health and welfare: dairy projects

on the demonstration network



FARMING
connect

cyswllt
FFERMIO

08456 000 813



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

www.gov.wales/farmingconnect

Foreword

The health and welfare of every dairy herd is fundamental to a profitable and efficient milk industry. Ensuring cows are healthy will improve fertility, yield, longevity and disease resistance as well as reducing costs.



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 demonstration farm and focus dairy sites during the past three years. They highlight how farmers participating in this initiative have benefited from introducing more efficient and often innovative ways of working and how they are utilising new technologies, genomics and metabolic profiling to address specific issues. By today, the improved systems, hygiene and veterinary regimes they have implemented are making a significant contribution to the health of many Welsh dairy herds, to their productivity and ultimately to profitability.

Topics and issues range from reducing antibiotic levels and optimising their use, critically important to those in the food supply chain, to selective dry cow therapy and from lameness to mastitis. Addressing these very typical yet common issues

can do so much to help improve the overall health and wellbeing of the herd while also reducing costs and saving farmers valuable time.

Each farm business in this booklet has been helped to achieve 'more from less' to help build sustainable high welfare dairy systems fit for the future. We hope that their learning and first-hand experience inspires you to consider implementing new and improved systems within your own dairy business.

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, 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
Spring 2020

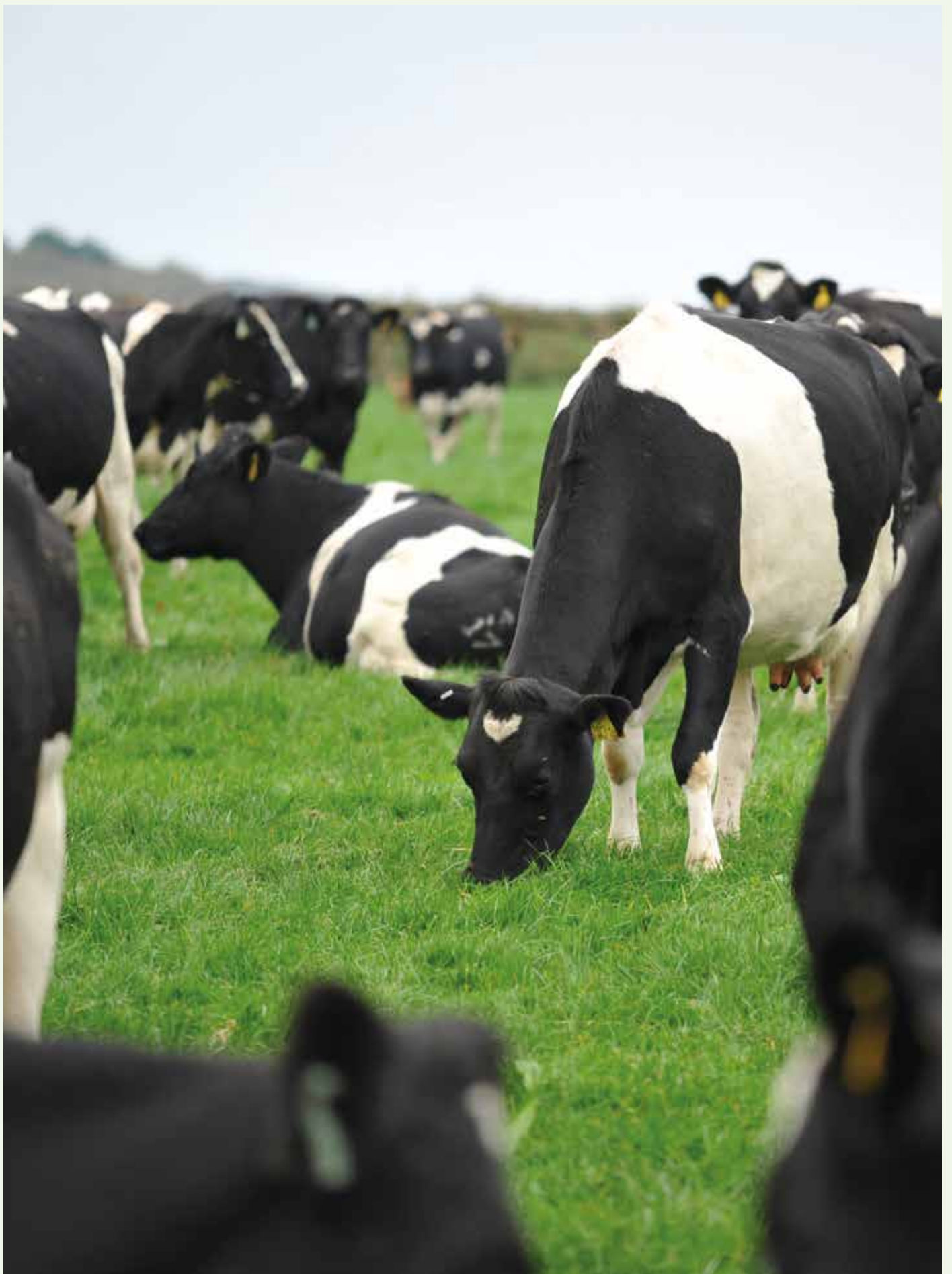
Farming Connect - helping you drive your business forward

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
- benchmark your performance and work towards progress and growth
- 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



Antibiotic use in the dairy industry



Many dairy farmers in Wales use significantly more than 21 mg/kg of antibiotics, which is the industry national target for 2020. The use of antibiotics as a preventative prophylactic treatment is not uncommon, increasing the risk of resistance issues. However, there are alternative strategies which, when used in conjunction with veterinary advice, can be very effective and contribute to achieving the industry target.

Veterinary advice is key to reducing antibiotic use



Goldsland focus farm, in the Vale of Glamorgan, is working to optimise antibiotic use in their dairy herd in order to make cost savings and ensure high food safety and assurance standards. Working with other dairy producers, the project gathered antibiotic use data across participating farms, including volume and frequency of use. Benchmarking allowed for a discussion of alternatives and strategies to reduce antibiotic use, with information provided and discussed by the farmer group on types of antibiotics and how to improve efficiency and optimum usage.

“Start gathering data, talk to your vet, learn and find out why you have the problems you do, get to the heart of it and make changes so you prevent the problem in the first place.”

Abi Reader, Goldsland Farm

Project results

Somatic cell counts reduced from **190,000 cells/ml** to **98,000 cells/ml**.



Annual antibiotic usage at Goldsland Farm decreased from **15 mg/PCU** to **10.89 mg/PCU**.



Use of critically important antimicrobials reduced from **0.3 mg/PCU** in 2015-16 to **0.1 mg/PCU** during 2016-17, without compromising welfare.





Managing mastitis in the dairy herd



Reducing mastitis incidence will:

- Reduce herd health costs.
- Improve yields, milk composition and quality.
- Improve animal welfare by having a healthier herd.
- Increase staff morale by having to treat less animals which helps free up staff time.
- Reduce antibiotic usage as a result of less animals needing treatment for mastitis.
- Reduce the number of animals having to be culled for mastitis.
- Increase overall business profitability as a result of reduced health costs making the business more competitive.

Implementing a mastitis control plan in 2019 at Longlands focus site, near Newport has already proved its worth and has significantly reduced levels of mastitis in the herd.

- 15% of cows with a somatic cell count of >200,000 cells/ml down from 20% of 2018 rolling average.
- New infection rates during the dry period <10% in early 2019 compared to 20.5% in 2018.
- The dry period cure rate for infections has risen from 68.4% in 2018 to 90% in early 2019.
- Cost savings amount to £18 per cow between October 2018 and March 2019.

Nantgoch focus farm, near Oswestry, has a herd of 750 Holstein Friesian dairy cows calving in an all year round system.

The herd experienced very high rates of clinical mastitis with lots of recurrent cases three years ago which increased herd costs substantially.

Project results

Implementation of the control strategy resulted in a saving of **£57,000** annually based on a herd of **750**.



	2013/2014	End of the Project
Cows in herd (head)	649	768
% herd calved in 12 months	76	80
Culling rate (%)	2.33	3.28
Yield per cow (litres)	9,998	10,581
Butterfat (%)	3.85	3.83
Protein (%)	3.15	3.30
Somatic Cell Count	226,000	154,000
Bactoscan	35	48
Mastitis levels (cases/100 cows)	88	28
% cows culled for Mastitis/SCC/Udder Issues	8.6	2.7

Mastitis rates were 70 cases per 100 cows, costing the business £120,000.

With Farming Connect and AHDB support mastitis cases have now reduced through analysing records, implementing the AHDB Mastitis Management Plan as well as monitoring success levels.

Key messages

Improve drying off procedure

- Pre dip teats prior to drying off.
- Clean teats before drug infusion with cotton wool and surgical spirit.

Modify transition cow environment

- Ensure slurry is scraped out on a daily basis.
- Ensure cubicle beds are clean and well bedded.

Modify calving cow environment

- Reduce overall stocking rate if this is causing issues.
- Clean out bedding every 2-3 weeks.
- Add clean bedding straw daily.



Using selective dry cow therapy



Selective Dry Cow Therapy (SDCT) can help reduce mastitis levels, antibiotic use, and increase herd productivity. Holebrook Farm near Wrexham trialled the implementation of SDCT as a focus farm project.

Key messages

- Full monthly recording data, together with accurate mastitis treatment records, is essential when reviewing somatic cell counts (SCCs) during current and previous lactations.
- Clinical mastitis samples should be collected from each cow. These results identify the mastitis-causing pathogens.
- Using SDCT is not appropriate for cows with a lactation average SCC of more than 100,000 cells/ml, or those that have had a case of clinical mastitis in the latter stages of lactation.
- Every cow treated with a dry cow antibiotic should be given a sealant; those with low cell counts should be given a sealant only.
- Teat end scoring should be carried out on all cows at drying off - any animals with teat damage or warts to be treated with both antibiotic and sealant regardless of SCC values.
- Good advice and support from a vet is key to successful implementation of SDCT.

Targeted antibiotic use

- Work with your vet to use milk recording data and cow history to choose cows suitable for selective dry cow therapy.
- Examine under the cows' feet routinely and seek veterinary advice early if lesions are detected.
- Manage and treat lame cows according to their mobility scoring.

Implement a mastitis management plan

- Managing poaching around gateways, water troughs and feeders should be routine practice.
- Lactating cows should be fenced out of dirty and muddy areas.
- Cows should not be left lying, grazing or loafing for longer than two weeks in the same area.

Improved housing and environmental conditions

- Poor cure rates may reflect some 'persistent' infection and/or reinfection from the environment. Often this is a seasonal effect.
- Improved ventilation in housing will help with herd health.
- Improved ventilation in calf rearing sheds will reduce incidents of pneumonia as cleaner air will circulate.

Reducing/optimising use of antibiotics

- Seek veterinary advice to ensure antibiotics are used appropriately.

Project results

Dry cow antibiotic tube use reduced by **40%**.



There was minimal difference in infection rates between cows on sealant and those on antibiotics.



On average, of the cows given sealant alone, **76%** experienced a cell count drop and **24%** a cell count rise.



Of those administered antibiotic dry cow therapy, **72%** had a cell count drop and **28%** a cell count rise.



SDCT is now a standard part of the Holebrook Farm drying off protocol.



Tackling lameness in the dairy herd

Usually a pain response, lameness is a change in the way a cow moves which can be assessed easily and cost-effectively on farm by mobility (or locomotion) scoring. Early detection of problems can reduce their severity, so regular mobility scoring is considered best practice, although it can be subjective and time consuming. Farming Connect has run events across Wales on the topic of lameness, including a Master Lameness Course at Coleg Gwent, Usk, promoting the gold standards associated with eradicating lameness from the dairy herd. Management recommendations included:

- Good health record keeping is an important first step in reducing dairy herd lameness allowing farmers to pinpoint the major risk factors in their own herds.
- Work with your vet to implement the herd health plan and address any lameness problems.

Average cost of a dairy herd lameness case - **£250**



Sole ulcers are the most costly cause of lameness



Each sole ulcer case costs over **£550** (and more if the cow is culled)



Key messages

A common misconception is that stones are an underlying cause of sole ulcers. Stones are often wrongly linked to white line disease. However, white line disease typically occurs at the back of the foot towards the heel – if caused by stones it wouldn't always affect the same spot.

Stones can make an existing problem worse but are not the root cause.

A common belief that sole ulcers are linked to acidosis has never been proven, they occur due to poor cow comfort and suboptimal transition management.

If the problem is digital dermatitis, hygiene, foot bathing and early treatment as prescribed by a veterinary surgeon is essential.

Transition management is key to tackling white line disease, as well as ensuring good cow flow around the farm and alleviating any sharp twists and turns.

There are three main causes of lameness in dairy herds –

- White line disease
- Bruising and sole ulcers
- Digital dermatitis.



Utilising GPS devices to detect lameness in dairy cows.

Technology can play a greater role in future mobility monitoring, to help identify and reduce lameness in the dairy herd. At Trawscoed Innovation Site near Aberystwyth, a 'Step Matrix' system was installed to measure the force and direction of hoof placement of cows exiting the parlour. This allowed daily analysis of data, earlier detection of locomotion changes and recovery monitoring. GPS technology was used to evaluate changes in the proportion of time spent displaying three behaviours – grazing, resting and walking.

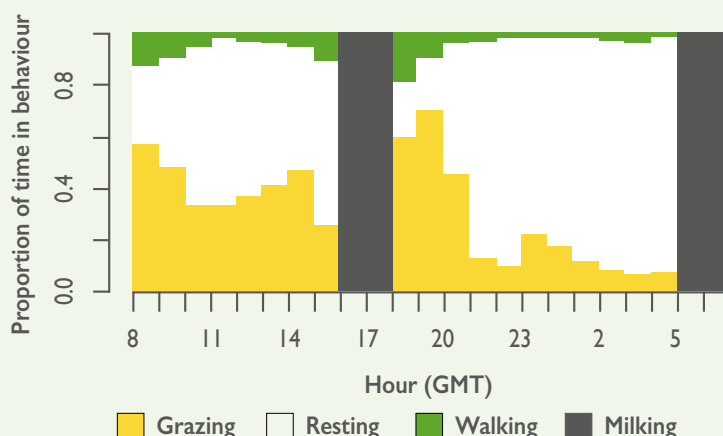
A total of 55 Holstein dairy cows were followed in groups of 11 for 14 days per group between May and September 2017. Cows were fitted with a GPS collar and variables measured were body condition score (BCS), lactation levels and months in lactation. All variables were analysed for links between the behaviours, weather and grazing.

Project results

- The lactation stage caused cows in mid and late lactation to graze for an average of 31 minutes/day more than cows in early lactation.
- Field size significantly impacted the time spent grazing. With each additional hectare increase, grazing time increased by an average of three minutes.
- Grass allocation did not significantly alter the amount of time cows spent grazing, walking or resting.
- Cows spent the greatest proportion of time grazing immediately after turn-out in the morning and evening after milking with a very small proportion of time allocated to grazing during the night.

On average, cows spent:
414 minutes/day grazing
679 minutes/day resting
48 minutes/day walking

- Each 1°C increase in average temperature led to more grazing (+ six minutes).
- For each 1 km/h increase in wind speed, grazing increased by seven minutes on average.
- Every one mm of rainfall tended to add approximately one minute to the time cows grazed.



Key messages

- Cows in pasture-based systems are open to more weather and grazing variables than those indoors which could impact their performance.
- By using precision technologies farmers gain an insight into the daily patterns of cow behaviour and can use this information to optimise their production systems.
- This work leads to a greater understanding of the conditions in which cattle perform best, resulting in tailored grazing strategies for individual farms.



Implementing an efficient milking routine

The milking parlour is an integral part of any dairy farm

Make sure the parlour fits the needs of the business and is tailored to the herd requirements.

Ffosyfier focus farm near Boncath, has an organic dairy herd, with a production average of 6,500 litres at 4.1% butterfat, 3.3% protein, operating a block calving system from September to December. This project looked at increasing the effectiveness of the pre-milking routine with the aim of reducing milking time and reducing teat end damage to the cows. Undertaking milk flow monitoring measured the impact of the introduced changes.

Project results

Milk meters were found to be misreading by +/- 15%. Recalibration resulted in feed savings of **£30,345**.



The project compared the effectiveness of using washed reusable cloths versus paper towels at reducing bacterial load on the teats.

There was a 95% reduction in bacteria levels using the cloths compared to a 48% reduction using paper towels.

Additional gains were achieved by addressing poor cluster position and preventing over milking; both resulted in higher milk flows.

Post milking spray nozzles were providing poor coverage of the teats. Replacement of the nozzles was done for under £10.



What should be aimed for in an efficient milking routine?

- Reduced milking time.
- Reduced cases of mastitis.
- Maximised milk value.
- Increased milk yields.
- Reduced energy costs through enhanced milking.
- Development of best practice protocols.



Key messages

Simple parlour adjustments may only cost
50p/cow.



Ffosyficer now undertakes regular parlour reviews, asking themselves:

Are spray nozzles covering the teats adequately with post spray?

- Poor coverage often goes unnoticed.
- Many spray nozzles will not effectively cover the teats with post milking disinfectant spray.
- If this is the case then new spray nozzles should be purchased.
- Test by spraying onto a paper towel.

Are your clusters correctly positioned?

- Poor cluster positioning can cause inconsistent milk flow.
- Length of the milking pipes can determine cluster position and the position of the swing arms.
- Poor cluster positioning can cause milking-out inconsistencies.
- Staff must be made aware of the importance of the position of the swing arm.



Are milk meters being correctly read?

- As milk yields in the parlour are being used to ration cows with concentrates, inaccuracy can result in inappropriate feeding regimes.

Are cows being over milked?

- Over milking can cause teat end damage.
- Over milking increases the risk of mastitis.

Using genomics to boost dairy productivity

Genomic testing of black and white stock bulls

Many commercial dairy producers often use beef or dairy stock bulls to sweep up any repeats after a period of artificial insemination. Bulls are bought either privately or through specialist bull sales and are often set to work on bulling heifers as well as cows.

Untried and untested bulls are often bought on parent information along with the look and conformation of the bull itself, but genomics allows the farmer to select with more precision, on health and production traits.

Three yearling bulls at Shordley Hall focus site, near Wrexham, were genomically tested through Holstein UK and AHDB Dairy's genomic evaluation service.

Project results

The bulls had their genomic proofs returned with reliability for various traits of between 58% and 68%, which doubles that of parental average alone.

Name of Bull	£GPL	Milk Kg	Somatic cell count (SCC)	Direct calving ease (dCE)	Type Merit (TM)
Aintree Squire	£522	560	-18	0	2.82
Aintree Sterling	£454	101	-17	-0.1	1.61
Aintree Wesley	£463	417	-12	0.2	2.47

Production, health and conformation traits from the genomic proof of three young bulls bred at Shordley Hall

Aintree Squire ranked in the top 30 genomic young bulls according to the UK genomic type merit index and just inside the top 500 young bulls for Profitable Lifetime Index (£PLI) if he was available commercially.

All three bulls had favourable negative somatic cell count values and were above £450 on £PLI.

If used on heifers it would be wise to consider the relative average calving ease score of the three bulls before using widely on maiden heifers.

Key messages

- With a single test costing around £100, sellers of black and white stock bulls should consider the possibility of testing and providing buyers with the additional reliability and information a genomic proof provides.
- Genomic detail can be used to select which bull to use on the home farm herd, and also provide buyers with additional reliable information regarding production, health and conformation potential.
- The information provides the equivalent reliability to that of any young genomic bull semen sold by any breeding company.

The value of genomics in selecting dairy heifers

Using genomics to breed the best dairy females will increase the genetic value of replacements and reduce the number of lower-genetic-merit animals coming into the herd.

Genomically testing females works on the same principle as genomically testing young bulls. By taking a DNA sample from a young heifer, it is possible to get an immediate indication of genetic merit, rather than having to wait for that animal to calve and start milking. Specific animals can then be selected to produce replacements depending on individual farm breeding requirements.

Genomic testing gives the cow a £PLI, providing an indication of the value of that animal to the herd.

Trialling the use of genomics with dairy heifers

At Marian Mawr demonstration site near Rhyl, tissue samples were taken from heifers using NMR's GeneTracker service, comparing the use of parental average figures with genomic testing results.

Project results

- A positive £PLI for all but one of the animals.
- Reiterating the importance of matching the herd potential with the milk contract requirements. The project identified a cow with poor £PLI score for milk kg, but good PLI score for butterfat and protein. Therefore she was a poor performer for a liquid milk contract, but good for a manufacturing contract.

Key messages

- Genomic testing has an accuracy rate of 70% compared to between 30-35% from using parental average figures
- Breeding from £PLI positive females helps improve herd productivity.
- Conversely, there is an economic disadvantage to breeding from an animal with a negative £PLI.
- If negative £PLI cows are kept, breed them with a beef animal, and don't breed your dairy replacements from them.
- It is important to remember that herd management is also a major contributing factor. Genetics can only take you so far; it is down to the farm environment and herd management in order to make sure that animals reach their genetic potential.



Metabolic profiling of dairy cows to improve efficiency and production

Metabolic profiling can be used as a diagnostic tool or to predict disease risk to help prevent or treat economically significant diseases (such as ketosis, fatty liver or milk fever). It involves blood analysis to evaluate internal functions and how these might affect the animal as a whole. The results are used to assess the nutritional state and fertility of animals, particularly those in the transition period - this is the time three weeks before and three weeks after birth.

At Sychpant focus farm near Cardigan, metabolic profiling was used to investigate the impact of nutrition on fertility in the three times a day milking system. Cows are fed a total mixed ration (TMR) and are high yielding as a result, but the trade-off is that any nutritional problems will quickly affect not only milk yield and quality but also fertility.

Using a herd sample, the project measured the cows' metabolic profiles throughout the season, monitoring the changing ration and the reaction of the cows. Feed cost efficiency was analysed, and cows were body condition scored (BCS) as an on-going benchmark.

Project results

Blood tests carried out on dry cows highlighted energy problems with their diet. These dry cows looked to be struggling prior to calving, with all of the 'close up' dry cows tested having high butyrate, low glucose and/or raised non esterified fatty acids (NEFA) values.

Energy balance results in the mid lactation group at an average of three months calved were good. The milking cow ration at time of testing was therefore meeting their energy needs for the high levels of milk production.

All of the milking and dry cows tested had good urea-N results, showing that daily intakes of effective rumen degradable protein (ERDP) was satisfactory.



Results showed magnesium and phosphate intakes from the milking and dry cow rations were satisfactory, and selenium status was excellent.

Further investigations indicated dry cow dry matter intakes were too low at 9kg DM/day. The recommendation was to aim for intakes of 12-15kg DM/day, achieved through feeding a good quality silage rather than increasing the amount of concentrates.

Key messages

- Metabolic profiling allowed the business to identify issues prior to them impacting negatively on cow health and productivity.
- The bespoke advice resulting from the testing provided valuable management information.
- Focus on ensuring dry cows get sufficient forage in the run up to calving.
- Long fibre must be chopped and properly mixed through the diet to ensure intakes.
- These 'close up' dry cows require fresh, palatable ration in front of them 24 hours a day to enable them to eat to their potential.
- The ration needs to be fed fresh each day, with spoiled feed cleared away before fresh ration is put out.



Tackling mycoplasma bovis and dairy calf pneumonia

A project at Wern focus farm site near Bancyfelin used an autogenous vaccine to address a persistent *Mycoplasma bovis* problem in their herd. This is a highly contagious bacterium, a major contributor to calf pneumonia and is also associated with meningitis, eye and ear infections as well as arthritis, mastitis, abortion and infertility in adult cows.

Autogenous vaccines are custom-made vaccines (often called herd-specific vaccines), using a pathogen isolated by the vet from an animal or several animals within that herd. The pathogen sample is sent to a laboratory that cultures and grows it, creating a vaccine specifically for that herd.

Due to the cost of research and development, there may not be a vaccine for a certain pathogen that affects only a small segment of the livestock industry, and an autogenous vaccine may be an appropriate route for tackling a persistent economic health issue in a herd.

Farming Connect supported the trial because of growing levels of *M bovis* infection in Welsh herds and a need to understand more about this disease.

Calf mortality due to the infection was significant - the rate of calf deaths from birth to weaning in January 2019 was at **63%**.



Cows were vaccinated at six weeks and three weeks pre-calving. Calves were then given the vaccine at two weeks and four weeks old. The first of the vaccinated cows calved in February and mortalities in that month dropped to 32%.

Five hundred doses of the vaccine – sufficient to protect 125 calves – were produced for the trial at a cost of £7.50/dose, which worked out at £30 per treated calf.

Project results

A reduction in calf mortality from **63%** to **32%**.



The cost of vaccination was high, but it was economically viable at Wern.

The project has helped the herd replenish following high levels of TB losses. Keeping calves alive for heifer replacements is a priority for the farm.

Management changes at Wern

Vaccination should not be used in isolation – herd management also plays a key role in protecting cows and calves from *M bovis*.

There is now a dedicated calf rearing area at Wern – calves were previously housed in a section of a building used for cows on the point of calving.

Improvements have been made to colostrum management.

Changes have also been made as regards grouping cows and to the dry cow diet. Instead of running the dry cows as one group there is now a close-to-calving group where cows receive 2.5kg of dry cow blend in combination with silage and chopped straw for three weeks pre-calving.



Key messages

Once *M bovis* is in the herd it is very difficult to control. It spreads from calf to calf through direct contact, colostrum and whole milk. It is often misdiagnosed as pneumonia or joint ill so many farmers are unaware they have *M bovis*.

Work with the farm's vet to consider all causes of calf mortality before embarking on a vaccination programme. It is important to rule out other causes before spending money on *M bovis* vaccines, if pneumonia symptoms are the result of other infections.

The more vaccines a farm purchases, the lower the cost per dose as is the case when a farm re-orders the vaccine in subsequent years.

TB may be indirectly responsible for the rise in the number of cases of *M bovis* in Welsh herds because more farmers are buying in cattle.

This highlights the need for careful sourcing of replacement stock, including post-purchase isolation and testing before mixing new cattle with the resident herd.



Farming Connect

-  www.gov.wales/farmingconnect
-  **08456 000 813**
-  farmingconnect@menterabusnes.co.uk
-  [Facebook.com/FarmingConnect](https://www.facebook.com/FarmingConnect)
-  [@FarmingConnect](https://twitter.com/FarmingConnect)