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## Focus Site Project Review

The responsible use of antibiotics in dairy cattle at Goldsland Farm, Wenvoe

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Ewrop yn Buddsoddi mewn Ardaloedd Gwledig  
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# 1 Summary

## 1.1 Project background

Currently it is legal within the EU for dairy farmers to use antibiotics routinely, with the most common reason to control/prevent mastitis incidence in the herd. Antibiotics are often used across the whole dairy herd rather than on individual cows, to prevent occurrences of mastitis during the 'dry' period<sup>1</sup>. With recent concern regarding the future effectiveness of antibiotics in human food chain, more effort is being made to conserve the effectiveness of the antibiotics that we currently have available to us for animal and human healthcare. The O'Neil Commission<sup>2</sup> has highlighted the need to preserve antibiotic use for the future, and stressed the need for antibiotic benchmarking within the agricultural industry.

This project sought to encourage responsible use of antibiotics on Welsh dairy farms, whilst also improving health and welfare, and reducing veterinary overheads for participating dairy farmers.

The Focus Farm selected was Goldsland, farmed by Abi Reader and her father. Abi has an appreciation of the need to optimise antibiotic use in her dairy herd, both for cost savings and to ensure high standards as regards food safety and assurance. Abi is very active as an industry representative, as an NFU member, a previous Farming Connect Agri Academy participant, 2017 Wales Woman Farmer of the Year, and an advocate of the Open Farm Sunday initiative. Her profile within the industry means that her Focus Farm project work can be shared and disseminated effectively around the sector and across Wales, providing the basis for an antibiotic optimisation protocol for use on other farms.

Championed by Abi as the focus site farmer, the project gathered antibiotic use data from a number of farmers and highlighted where and when antibiotics are being used on those farms. Benchmarking allowed for a discussion of alternatives and strategies to reduce antibiotic usage, with information provided and discussed by the farmer group on types of antibiotics and how to improve efficacy. This work should help lengthen the effective lifespan of existing antibiotics at risk of becoming less effective due to overuse and resistance build up.

### **Focus Farm Project key objectives:**

1. To educate on the use of antibiotics: through learning how to reduce any unnecessary doses and ensure responsible use of antibiotics on Welsh dairy farms
2. To gather data regarding drug purchases per year, this will highlight where and when antibiotics are being used on selected farms
3. To encourage the use of benchmarking to attain alternatives and strategies to reduce the use of antibiotics
4. To educate on the preservation of at risk antimicrobials for use by future generations

With the support of James Breen from Quality Milk Management Services Ltd, Abi and the other participating farmers worked to assess their current usage, and benchmark their usage and targets. These were then compared to those agreed for the dairy industry nationally (as part of the Dairy Sector Plan for

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<sup>1</sup> Alliance to save our antibiotics. 2016. *Antibiotic use in the UK dairy sector*. Alliance to save our antibiotics. Available from: [www.saveourantibiotics.org/media/1762/antibiotic-use-in-the-uk-dairy-sector.pdf](http://www.saveourantibiotics.org/media/1762/antibiotic-use-in-the-uk-dairy-sector.pdf). (Accessed 13<sup>th</sup> August 2018).

<sup>2</sup> <http://bsac.org.uk/securing-new-drugs-for-future-generations/>

reducing antimicrobials), as outlined below. Awareness raising of these issues, and Abi's journey to-date was explored at an open day in August 2018.

## Dairy Sector Targets

	Subject	Baseline Figure	Targets 2020	% Change
1	HP-CIA injectables (mg/PCU)	1.075*	0.538	-50%
2	HP-CIA intra-mammary use (DCDVet)	0.332*	0.166	-50%
3	Intra-mammary tubes – dry cow (DCDVet)	0.842*	0.674	-20%
4	Intra-mammary tubes – lactating cow (DCDVet)	0.808*	0.727	-10%
5	Sealant tube usage (average number of courses per dairy cow)	0.5*	0.7	+40%
6	Total usage (mg/PCU)	26.2**	21.0	-20%

\* Measured using 2015 UK sales data \*\* Measured using FarmVet Systems survey



### 1.2 Farmer's perspective of the project

The project really helped Abi the host farmer move towards a targeted antibiotic use regime, combined with better herd management. Working closely with her veterinary practice Abi has been able to continue to decrease her antibiotic use even further, without compromising welfare.

Abi is now implementing a mastitis management plan, and is currently changing farm practices to help decrease cases of mastitis, such as placing stone on gateways and water tank areas. Although implementing such practices can be costly in the short term, Abi feels that such practices will financially benefit the business in the long term. Financial savings will be made on the cost of drugs and reductions in animal loss, as well as increasing milk production.

Abi is currently erecting a new cow shed on the farm, with improved ventilation which should help with herd health. Once this shed has been erected Abi hopes to then make improvements to her calf rearing shed, incorporating improved ventilation for cleaner air aimed at reducing pneumonia incidence.

Overall the project has been incredibly successful in raising awareness regarding antibiotic use and providing practical solutions across all farmer groups involved. All farmers have gained knowledge on ways in which they can reduce/optimize usage and on measures to improve overall health and welfare of all cattle.

### 1.3 Project Conclusions

The majority of the conclusions provided by Farming Connect and James Breen related to the work done on Abi's farm, with the other dairy farmer participants learning and working with her to better understand the issues of reducing/optimising antibiotic use long-term.

The group approach to data collection, testing and technical advice is part of the subsidised KT service available through Farming Connect. Farmers are able to access a similar range of services to that of the project participating groups, with at least 80% funding available. Other Farming Connect services that would be relevant are nutrient management plan/soil sampling, nutrition and business planning advice.

#### 1.3.1 A review of antibiotic use on Goldsland Farm – a summary.

- For the last six years, antibiotic use on farm as measured by mg/Population Corrected Unit (PCU) is generally low at less than 15mg/PCU, apart from 2014-15 which was twice this.
- For 2016-17, the overall mg use was 11mg/PCU, with 1.7 daily doses – this is very low.
- The use of the macrolide antibiotic 'Tylan' amounts to nearly 4mg and therefore one-third of the 2016-17 mg usage.
- This herd should review the use of 'Tylan' for lame cows in the absence of a diagnosis, and consider injectable anti-inflammatory INSTEAD prior to a diagnosis and discussion with the farm's veterinary surgeon.
- There is little room for improvement apart from this, and we need to be careful that we don't stop using antibiotic when it is important to treat.
- In particular, the reported dry cow therapy sales are very low, and given the herd cell count we may need to re-consider approaches to dry off where only 20-30% of cows have been receiving antibiotic dry cow therapy
- Finally, only 96 mastitis tubes were reported sold, which would suggest clinical mastitis may be under-reported and/or not treated, as this would only equate to 8 cases @ 6 tubes used per case

#### 1.3.2 Performance learning points across the Focus Farm Group participants

**Some herds are using significantly more than the national 2020 21mg/PCU target, with mastitis management a key decision factor**

There were mixed amounts of antibiotics used across all three farmer groups. Although the Newport group was below the target proposed for 2020, the Monmouth group were above it. Results concluded that many of the daily doses across certain groups were significantly more than the published target of 21mg/PCU. For example within the Newport group 5 out of 13 herds were seen to be using more than 20mg, as was the Vale group where 3 out of 13 groups were dosing higher than 30mg/PCU. Average daily doses across the groups were higher than recommended and some herds were seen to be using more than one daily dose, despite not always having a high mg use. It was found that 8 out of 13 herds were using more than 3 daily doses, whereas 8 out of 13 herds within another group were using more than 6 daily doses.

## 1.4 Other take home points for the industry

### 1.4.1 How does Goldsland Farm sit in comparison to the wider industry?

Response to government reports means the dairy sector needs to look at specific antibiotic use, both intra-mammary (dry cow and lactating cow) and injectable use. Target mg/PCU use is 21 by the year 2020. UK dairy herd antibiotic use is relatively low, with the average herd in a recent study using 16mg/PCU and 4 daily doses. Injectable use, antibiotic footbath use and various calf medications appear to drive 'high end' users as measured by mg/PCU. Goldsland farm is therefore currently in the best 25% of herds in terms of mg/PCU and daily doses, but as mentioned earlier there are still interesting areas to review

Currently, ~20% of the Goldsland herd is >200,000 cells/ml – reflecting decent control of subclinical infection in the main. However, this herd does tend to avoid milk recording some 'problem' cows with mastitis, leading to varying numbers of 'absent' cows and some likely under-reporting of the true prevalence of infection. Goldsland farm will not be unusual in this, the advice being that whole herd assessment will provide a more accurate picture on which to base management decisions.

The Dry Period Cure rate (i.e. cows that were >200,000 cells/ml in at least one of the three recordings prior to drying-off, but are <200,000 cells/ml at the 1st milk recording in the subsequent lactation) averaged just 68% in the last year – below the national target of 85%. A poor cure rate may reflect some 'persistent' infection (and a lack of antibiotic dry cow treatment in some cows?) and/or re-infection from the environment.

The latter is more common in most herds, and in this specific herd, the dry period cure rate is seasonal and decreased in summer, making re-infection from the environment the most likely explanation in most cases.

However, in other cases it is important to be aware that antibiotic dry cow therapy is a rational decision for cows that are likely to be infected at the end of lactation, and this remains a cornerstone of mastitis control.

Ultimately, with 21% of the cows calving down with a high cell count, the main driver of CELL COUNT in this herd is the dry period, and some rational decisions about antibiotic dry cow use AND management of dry cows in paddocks will be important.

### 1.4.2 Avoiding 'the need to treat' by focusing on reducing the rate of new clinical mastitis cases of the lactating period origin in the summer and autumn

Lactating cows should be managed accordingly, for example in paddocks. Lactating cows should be fenced out of heavily contaminated areas and common lying areas with cows lying, grazing and loafing for no longer than two weeks in a single area. Managing poaching around gateways, water troughs and feeders should be routine practice.

### 1.4.3 Reduce unnecessary use of antibiotics by taking a treatment approach to lame cows

Management and treatment of lameness in dairy cows requires regular mobility scoring; this should be used to produce an 'Action List' of cows that need close scrutiny/intervention. This will ensure early and effective treatment is administered. Those cows with a mobility score of 2 to 3 should be treated with immediate injectable antibiotics such as Ketofen, in conjunction with support from a veterinary surgeon. It should also be routine practice to examine cows through carefully lifting the foot and diagnosing any lesions present. There will need to be 'foul' in the foot or deep sepsis present before any injectable

antibiotic is prescribed. If neither are present then an antibiotic injection should not be administered to the cow.

#### 1.4.4 Consider moving to selective dry cow (SDCT) therapy with teat sealants

SDCT can reduce the prevalence and severity of coliform (e-coli) mastitis by up to six times in the next lactation, which could represent a significant saving, at an average of £450 per case in terms of milk loss and antibiotic use.

The use of internal teat sealants will benefit cows through protecting their udder health, whilst also reducing mastitis during the dry period and at early lactation. A natural protective barrier, called Lactoferrin is found in high concentrations of dry cow secretions which inhibits the growth of mastitis-causing pathogens. Higher yielding and older cows are more likely to benefit from the protective effects of an internal teat sealant and this should be a must when practicing SDCT.

Another Farming Connect project on this topic has shown the value of using SDCT in Wales, at [Geraint Thomas' farm Tyreglwys, Llangennech](#). This project has shown the value of undertaking drying off as a separate job, not during the milking routine. The hygiene needs to be absolutely meticulous, i.e. it has to be in a clean parlour after milking or before. It is crucial that strict hygiene practices are implemented, especially when using teat sealant alone<sup>3</sup>.

## 2 Project Review

### 2.1 Aim of the project

1. To educate on the use of antibiotics, through learning how to reduce any unnecessary doses and ensure responsible use of antibiotics on Welsh dairy farms
2. To gather data regarding drug purchases per year, this will highlight where and when antibiotics are being used on selected farms
3. To ensure the use of benchmarking, to attain alternatives and strategies to reduce the use of antibiotics
4. To educate on the preservation of at risk antimicrobials for use by future generations

### 2.2 Methodology

Championed by host farmer Abi Reader, 10 – 15 farmers took part in the project. Working with their vets, alongside facilitator Jamie McCoy and AHDB Dairy, all antibiotics purchased in the last year were listed, broken down into calendar months purchased, and classified according to their generation of drug. Product information was also gathered to allow calculations on a per head, per kilo, per litre or other industry standard basis.

This information was then passed onto Owen Atkinson, an independent consultant. Owen analysed what the results showed and completed a benchmarking exercise. Once this was completed, the information

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<sup>3</sup> Farm Advisory Service. Not dated. *Teat Sealant and Mastitis of Dry Period Origin*. Farm Advisory Service. Available from: <https://www.fas.scot/news/teat-sealants-and-mastitis-of-dry-period-origin/>. (Accessed 17<sup>th</sup> August 2018)

was then put into the AHDB calculator for antibiotic use and calculated how much antibiotics are actually being used per kilo/litre produced. Using this calculator allowed for consistent data to be collected throughout the programme.

The group then came together with their individual reports and benchmarks to brainstorm whether there were alternative methods to using those antibiotics within their own systems. The group session was facilitated by specialists and the meeting focussed on considering the use of different generation versions.

Each farmer was then offered a bespoke programme going forwards through a one to one clinic work with their vets or by attending targeted group sessions. Targets were then able to be set for individual farms working with their vets to future proof their antimicrobial use on farm.

#### **What information was recorded?**

- Purchases of antibiotics for 10 to 15 farmers
- Clarification of antibiotic type or generation provided
- What antibiotics are being used on farms and when these are administered
- Production data
- Where and when alternatives to antibiotic use were possible

### **2.3 Results**

Project results have been provided in the 1.2 and 1.3 sections of this report.

## 2.4 SWOT analysis

<b>STRENGTHS</b>	<ul style="list-style-type: none"> <li>• A collective approach to assessing and dealing with antimicrobial use on farms, with an associated collective learning/peer support process.</li> <li>• Reduced veterinary and medicine costs</li> <li>• Improved health and welfare of cattle</li> <li>• Reduced losses</li> </ul>
<b>WEAKNESSES</b>	<ul style="list-style-type: none"> <li>• Can be costly to implement preventative strategies, such as placing stone on gateway/water trough areas which can get highly poached.</li> <li>• Can be costly to renovate or erect sheds with improved ventilation standards</li> <li>• Intensification of the dairy sector is associated with high levels of antibiotic use, increased intensification is likely to increase this problem</li> <li>• Farmers who are not milk recording may need to collect individual samples from cows and have them tested before the drying off period if they are wanting to assess the status of each cow by using SCC reports</li> </ul>
<b>OPPORTUNITIES</b>	<ul style="list-style-type: none"> <li>• Implement a Mastitis Management Plan to help resolve issues</li> <li>• Further work with veterinary practices can help decrease antibiotic use further</li> <li>• Adopt methods such as selective dry cow therapy (SDCT)</li> <li>• Adopt methods that involve internal teat sealants, whether this is in conjunction with SDCT or not</li> <li>• Identify the strain of bacteria present on the farm, so medication can be targeted at this strain</li> <li>• The use of modern cephalosporin's for dry cow therapy should be reduced and only used for treatment on individual sick animals where no other antibiotic has been proved to work</li> <li>• Set targets for antibiotic reduction</li> <li>• Switch to a high welfare system with pasture access to reduce the need for antibiotics</li> <li>• Test kits – these allow farmers to identify pathogens in 24 hours, allowing for informed decisions in terms of whether to intervene with antibiotics or not</li> <li>• Further maximise health and welfare of cattle to reduce the need for antibiotics</li> <li>• Manage grazing to reduce the risk of disease transmission</li> </ul>
<b>THREATS</b>	<ul style="list-style-type: none"> <li>• Continued over-use use of antibiotics in the UK has potentially dangerous implications for both human and animal health.</li> <li>• Taking an evidence based approach to antibiotic use relies on the skills and capability the farmer, and may have a high cost initially, which could be disincentive to change.</li> </ul>

## 2.5 Alignment to sector's strategic goals

### 2.5.1 Objectives set by Wales Animal Health and Welfare Framework:

The project delivers a number of the objectives of the WAHWF, delivering against the following key actions:

- Increase awareness and education of anti-microbial resistance (AMR)
- Increase the promotion of good husbandry and biosecurity practices – advocate prevention is better than cure
- Promoting the responsibly use of antibiotics
- Support work to develop improved data collection and evidence gathering relating to AMR at a farm level to ensure a robust evidence base is in place to inform future generations

### 2.5.2 Fit with the RUMA Targets Task Force priorities

RUMA have identified the following as key areas to focus on, which this project direct contributes to:

- Data collection, including on farm software and the co-ordinating data hub
- Herd health plans
- Farmer training
- Vet training
- Supply chain
- Preventative and alternative routes
- Communication and PR

Key reduction targets outlined by RUMA, which the project helps the sector work towards are:

Focus 1: Overall reduction in the use of Highest Priority Critically Important Antibiotics

Focus 2: Selective dry cow management

And the project made a more general contribution to a greater awareness in the sector of:

Focus 3: Pneumonia/respiratory issues in youngstock

Focus 4: Use survey data to review the use of antibiotics in foot baths

## 3 Impact on the industry

### 3.1 Impact on individual business

This is covered in the 'farmers' perspective of the project' section of the report in Section 1.2.

### 3.2 Impact on wider industry

Refer to the 'take home points for the industry' section of the report in Section 1.3.

There is scope for the project concept to be replicated over other livestock farms in Wales. The results from all participating farms are excellent examples of how farmers can increase their knowledge base and improve management practices, resulting in a more proactive approach to using antibiotics in the treatment of infections such as mastitis.

These farmers should see a return on their investment in the longer term, via reduced veterinary and medicine costs, increased milk yield and overall improved health and welfare. The adoption of such an approach across Wales should lead to improved effectiveness of antibiotics when they are required.

### 3.3 Impact on Welsh Government's cross cutting and priority themes

#### 3.3.1 Climate Change

Changes to the climate have brought warmer, wetter weather patterns. Climate change presents us with potential production challenges –via an expected increase in warmer wetter conditions which will have impact on parasite levels, fodder production, and overall bacterial load. Effective antibiotic control plays an important part in optimising outputs from our livestock. If blanket treatments of antibiotics are routine and immunity to such antibiotics develop, this will result in overall system inefficiencies, leading to increased losses. Implementing alternative methods other than purely antibiotic use as a preventative measure will reduce the impact of infection on growth rates, feed requirements and milk production.

#### 3.3.2 Animal Health and Welfare (AHW)

Routine doses of antibiotics as a preventative method can result in major adverse effects on herd health as disease immunity to antibiotic strains develop. Exercising good management protocols to promote good animal health and welfare, whilst treating with antibiotics only when necessary, will result in reduced mortalities and improved overall herd health and welfare whilst also leading to increased milk production.

#### 3.3.3 Future Generations

Adopting routine management and monitoring systems will reduce reliance on antibiotics. With farmers and the veterinary industries facing the challenge of resistance if existing practices continue there is the need to implement alternative strategies. Having a range of alternative strategies to deal with issues before they become a major problem will help future generations manage health issues such as mastitis and lameness more effectively. Reducing challenges faced by the industry should help inspire future generations to pursue or continue a career within the agricultural industry. Moving farming forward through the use of technology and enhanced learning could attract new people to the sector.

#### 3.3.4 Tackling Poverty

Focusing on improving animal health and welfare on farm is a livestock management tool, reducing overall losses and resulting in higher productivity. Investments in management practices will alleviate the costs associated with veterinary and medicines on a medium to long term basis. Improving productivity is likely to influence on-farm profitability and therefore act as an influencing factor in tackling poverty in agriculture. Businesses running a cost efficient, sustainable system have the potential to increase returns through increased income both on and off the farm.