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Focus Site Project Review

Implementing Sustainable Control of Parasites in Sheep (SCOPS) and getting to grips with Faecal Egg Counting (FEC)

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1 Summary

Hendre Ifan Goch, Rhosgoch and Tyn y Pant farms participated in parasitology projects focusing on worm burdens in their sheep flocks, as Farming Connect Focus Farms. All farms wanted to try incorporating faecal egg count (FEC) testing into their routine flock management, to see if they as farmers could adapt to using it, as well as using it as a tool to improve worm burden management.

Gastrointestinal worm infection has several associated issues including reduction in feed intake, a decrease in digestive efficiency and protein loss from the gastrointestinal tract due to tissue damage.

Anthelmintic treatment failure within the sheep industry is a significant threat to achieving sustainable lamb production in Wales and further afield. Treatment options are limited, with resistance levels increasing, and all farms wanting to ensure that they were making best use of what is available to them, in order to tackle the parasite load in their sheep.

Background information on all three farms is provided in Section 2 of this report.

Overarching business aspirations:

- Ensure that anthelmintics used in the flock are effective, avoiding/minimising any resistance issues.
- Be pro-active in gaining professional advice to obtain appropriate treatment, thus a successful business.
- Run a healthy and productive flock.
- Lessen financial and labour requirement.

Farm specific aspirations:

| | |
|-------------------------|--|
| Hendre Ifan Goch | <ul style="list-style-type: none">• Achieve optimum lamb weights and sell lambs before grass growth becomes stunted late in the season |
| Rhosgoch | <ul style="list-style-type: none">• Eliminate Coccidiosis from the sheep flock• Implement FEC in the cattle herd |
| Tyn y Pant | <ul style="list-style-type: none">• Address roundworm burdens• Ensure fluke is under control• Understand the cause of thin ewes at lambing |

Focus Farm Project key objectives:

1. To reduce resilience on wormers whilst maintaining good lamb performance
2. Utilise FEC to allow for informed decisions
3. Adapting a prevention rather than a remedial approach to lower worm burdens
4. Adherence to the Sustainable Control of Parasites in Sheep (SCOPS) principles.

1.1 Project Conclusions

1.1.1 Hendre Ifan Goch –Russell and Rhys Edwards

1. Identifying when worm burdens occur allows for much more effective dosing

Rhys and Russell were very surprised to find a high faecal egg count in the lambing ewes 2-3 weeks prior to lambing: singles 400 eggs per gram (epg), twins 665epg and triplets 980epg. Visual assessments of the ewes would not have indicated this level of infection. These figures show that worm burdens were in the medium to high bracket, based on SCOP categories (see Section 3.2).

Identifying a high FEC count just before lambing meant ewes were dosed with an effective treatment, with their body condition, lamb quality and lactation not being compromised. Rhys and Russell do not think they would have achieved the milk quality and quantity if the high FEC had not been picked up on.

2. Implementing SCOPS reduces worm burdens and resilience, and ensures treatments are fully effective

Undertaking the project allowed Rhys and Russell to gain awareness of SCOPS and implement as many methods as possible to reduce worm burdens. They have recognised the importance of a good quarantine system to ensure the flock are not exposed to off-farm parasites and disease. Bought in animals are now treated and quarantined on the farm yard before being introduced to the flock.

Rhys and Russell now try to paddock graze to reduce worm burdens (moving the sheep on reduces their exposure to worms present in each paddock, and also disrupts the worm production cycle, as the land is rested). Paddock grazing does however become difficult in late spring when less grass is available. Routine random sampling of FEC highlighted when wormers were required and enabled treatment to be administered at optimal times which saw lambs average a weight of 290g DLWG at 8 weeks with a zero worm count on lambs at time of weaning.

Fluking ewes twice with Closantel, 7 weeks apart, enabled Rhys and Russell to clear the fluke to zero. This killed down to 5 week old fluke and was administered when sheep were housed for 10 weeks, highlighting management advantages associated with housing pregnant ewes.

3. Anthelmintic use – getting it right

Although Rhys and Russell haven't yet seen any significant cost savings/difference prior to and during the project, they have recognised the importance of 'getting the product right'. The resistance testing found 99% of cases to be resistant to Triclabendazole, thus highlighting the importance of routine testing to ensure costly anthelmintics are being used efficiently and effectively.

Additionally, both Rhys and Russell discovered during the project that Oramec doesn't treat nematodirus and learnt how important it is to know what a product sets out to achieve, so again you can achieve full effectiveness. Oramec is an ivermectin product; nematodirus should be treated with a 'white' drench (a benzimidazole product).

1.1.2 Rhosgoch –Gethin Evans

1. Identifying when worm burdens occur allows for much more effective dosing

Most lambs were treated around the 22nd of April as FEC showed Nematodirus was present – and as the FEC showed low levels of strongyle eggs this helped Gethin decide to worm with a white drench (not always the case). Subsequently Gethin was pleasantly surprised that 2 groups of lambs went 9 weeks without needing another drench – even more of a surprise came when regular testing showed counts starting to decline without treatment. This was most likely due to the lambs developing immunity while not being exposed to a high worm challenge. One group of early lambs were grazing land that was

deemed as being dirty, which is why they would normally have been regularly wormed. However, these were supplemented with creep which meant they ingested less larvae as there was less grass in diet and the better nutrition boosted immunity.

The later lambs' FEC did jump up suddenly within 8 days (this shows the value of regular monitoring) and have been duly treated. Gethin will be carrying out a drench check on these lambs to see which wormers work on the farm. The other groups are still to be wormed and most lambs have now (December 2017) been sold fat which shows reducing treatments has not compromised performance.

2. Assessment of treatment resistance and overcoming inefficiencies

The project allowed for assessment of anthelmintic treatments and identified levels of resistance to both white and clear drenches. As a result, Gethin began drenching with a yellow drench. Improvements were also made to the timing of treatment following anthelmintic resistance assessment.

Overcoming treatment inefficiencies was supported by FECPAK, which regularly provided support in regards to queries and implementation of further measures.

Gethin found that although the FEC sampling required approx. 2 hours of labour per week, the benefits associated with improved lamb weights and flock health in addition to effective treatment use far outweighed costs of labour requirements. Management practices introduced as a result of the project were found to be fundamentally important at Rhosgoch and would be continued post project period.

3. Treatment of Coccidiosis

Whilst the project was being undertaken, Gethin also investigated the Coccidiosis issue the farm's lambs had suffered with annually. Gethin's vets took a sample from the lambs during February, and the results came back positive for Coccidiosis. Amendments were made to the timing and applications and products used. The vet also highlighted environmental factors which could trigger Coccidiosis such as location of feeding troughs, bedding and recommended the farm to change their disinfectant. The usual disinfectant used on the farm was found to be ineffective in cases of coccidiosis, so an alternative product was used.

Whilst assessing the timing of treatments, Gethin decided to vaccinate all lambs and not just those that were showing dirty ends. Gethin now has a policy of 'if one lamb requires treatment, all lambs will be given treatment' – so far this has proven very effective. Previously Gethin had treated lambs at 6 weeks old, but following sampling it was found that lambs were prone to Coccidiosis after 4 weeks, and therefore were infected prior to treatment. The farm now treats all lambs at 4 weeks.

4. Using mixed grazing as a tool for lowering worm burdens

Where fields were grazed with finishing lambs following heavy cattle grazing, faecal egg counts were low. This shows the benefit of mixed grazing in lowering worm populations, therefore reducing exposure and risk of contamination.

FEC was also conducted on all young cattle before turn out with results presenting a small worm burden. A long acting treatment of Cydectin was administered to the whole herd with no further monitoring or treatment carried out. Gethin hopes to further maximise the benefits associated with mixed grazing through routinely testing and treating the cattle for increased awareness of worm burdens across the entire farm.

1.1.3 Tyn y Pant –The Bennetts

1. Overall flock health has improved

The project allowed the Bennetts to explore three main areas which they wanted to address:

- ☐ Roundworm burden in lambs and first grazing season ewe lambs and yearlings
- ☐ Fluke control
- ☐ Thin ewes at lambing

2. The value of Body Condition Scoring

Prior to the project there were a number of thin ewes during lambing time. The Bennetts were unsure of the reasoning behind this. During the project, all ewes were conditioned scored at scanning and separated into groups depending on BSC and scanning results. By grouping ewes accordingly, a bespoke feeding regime was established, tailoring feed requirements for each group.

Dietary management and careful planning allowed thinner ewes to restore body condition in the run up to lambing. Consequently, the ewes had better milk production and stronger lambs.

3. Cost savings

The business made cost savings as a result of:

- ☐ Reducing dosage frequency, dependant on animal requirement, and not routinely treating
- ☐ Lower labour requirements

Before the project the Bennetts routinely drenched the whole flock, rather than studying individual groups. During the project animals were treated based on FEC and animal requirement, which reduced dosage frequency and subsequently labour requirement. The financial saving here would equate to circa £285 per treatment session (1,000 ewes drenched with Animec (an ivermectin product) at today's prices plus one 8-hour day of work for 2 farm workers @£10 an hour).

4. Knowing pasture history and managing grazing practice to identify and avoid wormburdens

The Bennetts aim to re-seed a % of their farm every year to improve the quality of grazing. However since undertaking the project, they see the value of re-seeding in reducing worm burdens. Therefore they plan to continue re-seeding on an annual basis.

During the project the family were informed by their vet that one plot of land was so highly infested with eggs that it should be completely avoided for grazing by sheep. By identifying this the family could strategically graze their sheep so they weren't exposed to this high infestation; thus lowering the risk of contamination.

1.2 Take home points for the industry

1. Identifying product resistance and adapting a practical and timely management approach will reduce associated costs and allows for a fully functioning and healthy flock

- Avoids use of costly but ineffective treatments
- Ensures effective treatment at required time
- Possibility of reducing dosage frequency as drenches would be administered on a requirement basis as opposed to routinely treating

In some cases administration of drenches will reduce with careful management. However, there is the possibility that drench use will remain the same. However, adjusting timing of treatment may result in a more effective dosage leading to increased productivity in terms of lamb weights and ewe productivity.

- Reduce the risk of drench resistance through careful management and administration of drenches to treat specific worms
- Use FECs to target treatments and avoid highly selective practices such as dosing before moving onto clean or low challenge pastures.
- Ensure sheep are not treated unnecessarily, particularly fit, healthy adults.

Providing farmers routinely conduct FEC sampling then this will help identify emerging worm burdens and act as a possible early warning signal. If identified worms persist this is a good indicator to resistance and therefore a vital tool when choosing treatment products.

It is only when the level of resistance exceeds 50% with over half of worms surviving the treatment that the consequences are visually obvious¹. Testing for resistance via FEC is therefore essential in order to ensure that the farmer is not exacerbating resistance levels with ineffective treatments.

Strategic drench use, in addition to routine monitoring of ewes and lambs will act as a preventative measure in eliminating risks associated with anthelmintic resistance.

Maximum efficiency has been reached by those farmers participating in FECPAK sampling through adjustments made to time of dosing, in order to ensure maximum efficiency:

Results from the Sainsbury FECPAK^{G2} Project –farmer experiences.

'The biggest change has been to dosing ewes with a reduction of 1 dose per ewe and a big change to timing of the spring / lambing dose. Testing showed that the old dosing regime was wrong and significant pasture contamination would have been missed. FEC is now used to refine exactly when and which ewes need dosing.'

'Only slight reduction in lamb dosing but a change to dose timing. Lamb deadweight's have steadily improved over the 2 year period with average weights last year 1.9kg better than before project started. This is approximately £2,400 more return for the farm (based on 350 fat lambs @ £3.60/kg), although a few changes in management will have influenced this, so can't pin it all down to better worm control.'

¹ AHDB. 2016. *Worm Control in Sheep for Better Returns*. AHDB. Available from: <http://beefandlamb.ahdb.org.uk/wp-content/uploads/2016/08/BRP-Worm-control-in-sheep-manual-8-170816.pdf>. (Accessed 23rd January 2018).

2. FECPAK principles

- Protects future threat of resistance
- Improves performance on farm through identifying worm burden across the entire farm. Throughout the FECPAK project by Sainsbury's 97% of case study farms believed regular faecal egg counts will help improve lamb growth rates. Lamb output increased throughout the project on an annual basis with £/ha increasing from £723.65 to £1,008.70. Income per ewe also increased from £91.89 to £127.97.
- Improved awareness of resistance to wormers which allows for farmers to change drench choice and timing.

Having recruited 59 UK farmers to take part in the project it was found that 84% of participants were using drenches that were not fully effective on their farm. Worm resistance to treatment builds slowly; farmers need to be mindful that wormers may not be associated with high levels of resistance, but also may not effectively clear the present worms, i.e. resistance is a progressive issue. Resistance levels may slowly be rising in the farm's worm burden. Farmer practice can and speed up or delay this progression towards resistance.

- Easy, accurate and reliable FEC improves farmer knowledge of issues facing the flock health. Being able to rely on accurate results ensures farmers are informed of farm conditions. Improving the education and knowledge of farmers is key to parasite management with the FECPAK being a highly valuable on farm tool to increase awareness and ensure farmers are well informed.
- Allows continual monitoring for the implementation of future management programmes. Routine monitoring will draw a picture of continual worm burdens and enable effective treatments to be administered.
- Reduced drench uses. Improved monitoring of worm burden lead to reduced drench use longer term, addressing concerns associated with chemical use in meat production. The project reported a 50% reduction in lamb drenching and an 80% reduction in ewe drenching, minimising costs for farmers whilst addressing consumer concerns².

²Thomas, E. 2017. *Parasitology Project at Rhosgoch & Sainsbury's FECPAK G2 Project*. Techion.

Table 1: Key Project Findings of FECPAK³

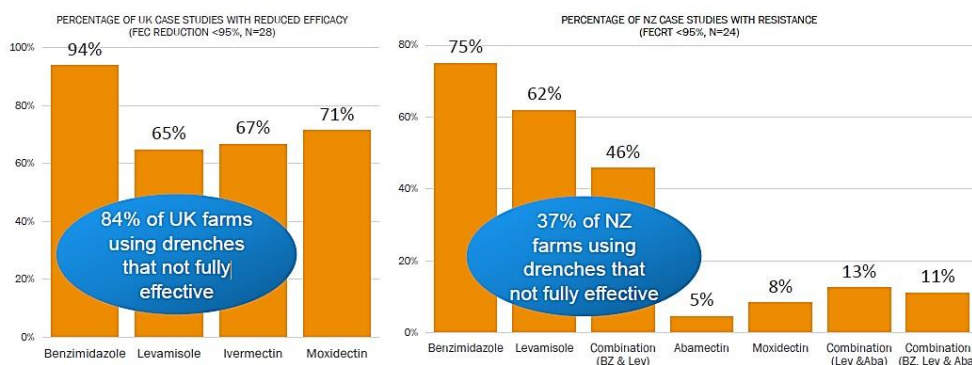


Key Project Findings



1. Project Farmers Surprised By Parasite Burdens And Drench Resistance

- Prevalence of resistance is alarming



3. Implementing the Sustainable Control of Parasites in Sheep (SCOPS) principles on your farm can deliver many benefits to your business:

- Ensuring treatment is fully effective
 Appropriate dosing and measures, product choice (anthelmintic), correct dosage, treatment technique, weight of the animal (don't guess weights, gun needs to be calibrated and maintained)
- Identifying resilience to products
 Using FECs, grazing options (mixed grazing to reduce stocking density of host species, new leys, putting finishing lambs on less contaminated fields), planning ahead
- Avoid introduction of worms and other parasites to your flock
 Quarantine methods, sheep scab, liver fluke, quarantine method, quarantine treatment methods (putting on yard – not onto pasture where they could drop contaminated eggs, treatment before exposure to other hosts)

4. Being in control will help deliver numerous benefits

Worm control should act as part of a wider flock management strategy with actions coordinated between the farmer and professional veterinary advisors. A wider flock management strategy should include actions to tackle other health issues, flock nutrition, ewe body condition scoring and grazing and forage management.

Action should be taken to address issues as and when they occur with routine monitoring providing an up to date health status.

³ Thomas, E. 2017. Parasitology Project at Rhosgoch & Sainsbury's FECPAK G2 Project. Techion.

Questions that you should ask yourself are:

- Are you in control of the worms on your farm? Do you know where and when they are most abundant?
- Could you use FECs and contamination mapping to monitor worm burdens and contamination levels?
- Do you have a quarantine strategy in place?
- Do the wormers you use work effectively? (Your anthelmintic resistance status)
- Do you ALWAYS treat correctly at the right dose?
- Could you reduce anthelmintic use in adult sheep?
- Could you use reduce your reliance on anthelmintics?
- Could you apply other control methods to control worms⁴

5. The importance of being informed and pro-active in gaining professional advice

- Check resistance through laboratory testing.

An indication as to whether a drench has been successful can be conducted via laboratory testing of faecal samples from 5-10 sheep once treatment has been administered. Ideally tests should be repeated at intervals as part of an ongoing monitoring process within a flock's health plan and seeking veterinary advice would be recommended.

- Ask for professional advice when choosing a treatment product.

Choosing the correct product to target worms correctly should result in a reduction in treatment frequency, saving time and money as previously discussed, in addition to reduced stock stress. When sourcing a product it is advised that professional advice from a veterinary practice is taken to ensure the chosen product is most effective. Narrow spectrum products should be chosen where appropriate to reduce selection for resistance to the broad spectrum groups. Correspondingly, use of combination products should only be used when deemed necessary⁵.

Taking a strategic approach to tackling worm burdens in your flock results in:

- 1) Increased financial returns - achieved through increasing animal performance, decreasing workloads and efficacy of drench used.
- 2) Reduced drench resistance - reduce the risk of drench resistance through monitoring performance and minimising drench use by only treating animals which require it.
- 3) Meeting consumer needs - meet customer demands in the meat industry by reducing chemical usage.
- 4) Being in control - through gaining valuable information enabling to implement a best practice approach to control parasites.

⁴ AHDB. 2016. *Worm Control in Sheep for Better Returns*. AHDB. Available from: <http://beefandlamb.ahdb.org.uk/wp-content/uploads/2016/08/BRP-Worm-control-in-sheep-manual-8-170816.pdf>. (Accessed 23rd January 2018).

⁵ XL Vets. Not dated. *Sheep Worm Control and Resistance Management*. X L Vets. Available from: <http://www.xlvets.co.uk/sites/default/files/uploads/files/Wormer%20imposed%20VF%20LOW.pdf>. (Accessed 23rd January 2018).

You can now facilitate your own flock faecal egg counts more easily, frequently and at fewer costs due to the FEKPAK^{G2} system. FEKPAK^{G2} allows for simple FEC on-farm, traceable, long-term FEC data, results sent straight to you, online access to your data, technical support and test reminders/animal health alerts tailored for your needs. <https://www.techiongroup.com/Products/FEKPAKG2>

2 Business Review

2.1 FARM PROFILES

2.1.1 Hendre Ifan Goch

Russell and Rhys Edwards farm at Hendre Ifan Goch, Blackmill, Bridgend; a 93 hectare farm with approximately 650 breeding ewes plus 150 ewe lambs. Ewes are mated with Aberfield, Texel, Suffolk, Blue Texel and Charolais rams. The farm is owner occupied and is not within an agri-environment scheme.

The Edwards decided to undertake this particular project as they had identified that lambs would fail to grow later on in the season, and wondered whether worm burden was the cause. They wanted to understand any underlying issues in the flock, and the Focus Farm initiative provided such an opportunity.

2.1.2 Rhosgoch

Gethin Evans farms at Rhosgoch, Llanilar, Aberystwyth. He owns approx. 100 hectares where he runs 550 breeding ewes. The majority of the breeding ewes are Lleyns with the remainder being Mules. He also has a herd of 50 suckler cows.

Having used FEC monitoring since November 2016, prior to his involvement in the Focus Farm, Gethin has found interesting results which has led to him to change his on farm parasite control strategy. Such monitoring was conducted through the Sainsbury's FEKPAK monitoring project which was aimed at improving parasite control with their lamb suppliers, this project running from May 2014 – March 2017. The subsequent Focus Farm project allowed Gethin to further build upon the findings of the Sainsbury's initiative. The project also allowed Rhosgoch to work closely with its vet to monitor and respond to cases of coccidiosis, which has been a recurring problem on the farm.

2.1.3 Tyn y Pant

Tyn y Pant near Berriew, Welshpool is run by the Bennett family. The family own 182 hectares and rent a further 28 hectares, predominantly grassland. The family run 900 breeding ewes, Scotch Black mules, Texel cross mules and Welsh mules which are mated with Blue Face Leicester, Texel and Aberfield rams. Additionally, the farm has a 70 head herd of breeding cows and heifers. The farm participates in the Glastir agri-environment scheme.

Before becoming a Focus Farm, the Bennett family recognised they had a problem with worms in their flock. This led them to contact their local vet and begin FEC work. An opportunity arose to become a Focus Farm which enabled them to continue with FEC but to also look at the results in more depth. It also allowed them to explore fluke issues on-farm and establish why some of their ewes were thin during the lambing period.

2.2 KPIs/business performance indicators identified by the farm businesses

The business performance Indicators for this project that were identified by the farms as areas of focus were:

- Increased lamb weaning weights
- Increased lamb weights at 8 weeks
- Kilograms of lamb liveweight per ewe at weaning
- Increased lamb carcase weights (Daily Liveweight Gain)
- Increased income

3 Project Review

3.1 Aims of the projects

1. Utilising data from FEC sampling to enable better management decisions
2. Adapting a prevention rather than a remedial approach to lower worm burdens
3. Adherence to the Sustainable Control of Parasites in Sheep (SCOPS) principles
4. To communicate and disseminate project findings to the wider sheep industry via open days, progression events and social media

Some basics:

What is a Faecal Egg Count (FEC)? <https://www.techiongroup.com/Products/FECPAKG2>

A faecal egg count gives the indication of the number of adult worms in the gut of a sheep. It is measured as eggs per gram (epg) of faeces.

FECs can be used to:

- ☐ Help determine the need to treat
- ☐ Provide information about the level of contamination on pasture
- ☐ Test the efficacy of a worming treatment (drench test)

What is anthelmintic resistance? (taken from [AHDB Better Returns Manual 8](#)):

Worms are resistant when they survive exposure to a dose of anthelmintic that would normally kill them. Survival is genetic meaning it is inherited by the next generation. This means that when worms are left alive in the sheep, the eggs that are shed in the dung have resistant genes.

Over time the proportion of the worm population carrying these genes then increase, and the process becomes non-reversible when they represent more than 50% of the population. This is because there are not enough susceptible genes to dilute the resistant ones when the worms mate.

How worm burdens affect lambs (taken from [AHDB Better Returns Manual 8](#)):

- ☐ Depressed appetite reducing feed intake and growth rates
- ☐ Permanent damage to the gut which reduces nutrient adsorption and causes diarrhoea
- ☐ Reduced protein metabolism reducing overall muscle growth and carcase quality
- ☐ Impaired mineral retention causing small skeleton and exacerbating any trace of element deficiencies

3.2 Project Results and discussion

3.2.1 Faecal Egg Count (FEC) Results

The table below outlines the SCOP thresholds for EPG levels used to determine what constitutes low, medium or high worm burdens.

| Low | Medium | High |
|---------|------------|---------|
| <250epg | 250-750epg | >750epg |

Sustainable Control of Parasites in Sheep

Summaries of the results for the 3 farms are provided below, for both pregnant ewes and lambs. Treatment timings were then based on this information, as well as using it to help determine any resistance issues.

For ease of interpretation, the high worm burdens are highlighted red and the medium ones orange (referencing off the SCOP thresholds outlined above).

| | FEC results of pregnant ewes EPG (eggs per gram) | | | |
|------------------|--|---------|---|----------|
| | Date | Singles | Twins | Triplets |
| Hendre Ifan Goch | 10/02/17 | 400epg | 665epg | 980epg |
| | 15/03/17 | 0epg | 0epg | 0epg |
| Rhosgoch | 06/02/17 | No data | 350epg | 805epg |
| Tyn y Pant | 20/02/17 Results from several groups (not split into litter size) | | 175epg 280epg 70epg 105epg 735epg | |

| | FEC results of lambs EPG (eggs per gram) | |
|------------------|---|---|
| | Date | Lambs >6 weeks old |
| Hendre Ifan Goch | 20/06/17 | 0epg |
| | 06/07/17 | 560epg |
| | 06/07/17 | 875epg |
| | 20/07/17 | 210epg |
| | 14/08/17 | 0epg |
| | 24/08/17 | 70epg |
| Rhosgoch | 19/04/17 | *Unsure of lamb age 135epg (all worms, but note the % of this being nematodirus) 140epg (Strongyle) 595epg (Nematodirus) |
| | 22/04/17 | 35epg (all worms) 35epg (Nematodirus) |
| Tyn y Pant | 18/07/17 | 560epg (all worms) |
| | 21/07/17 | 525epg (all worms) |

Also to note: At Hendre Ifan Goch FEC was also undertaken at 3-6 weeks and 6 weeks old for certain groups, with 0epg found. These results helped determine when to treat, in order to ensure efficacy.

3.2.2 KPI/performance attribute: Increased lamb weaning weights.

Hendre Ifan Goch

As a result of the project, lambs were growing at 300g/day and weaning at 25.5kg. Future work at Hendre Ifan Goch aims to get an extra 100g/day on lambs up to 12 weeks, resulting in weaning at 34kg.

Rhosgoch

Lambs administered with yellow drench reached higher weights than those drenched with the resistant clear and white anthelmintics.

3.2.3 KPI/performance attribute: Increased lamb weights at 8 weeks

Hendre Ifan Goch

Lambs grew well to 8 weeks, and better than in previous years.

3.2.4 KPI/performance attribute: Increased lamb carcass weights (Daily Liveweight Gain)

Hendre Ifan Goch

Reached an average 290g DLWG, with some growing at 300g DLWG. This is at the top end of DLWG performance figures.

Rhosgoch

Gethin commented that DLWG had increased, but no specific figures were provided.

3.2.5 KPI/performance attribute: Increased income/cost savings on treatments

None of the farms were able to categorically say that as a result of undertaking FEC and adjusting treatments, they had increased income levels. All farms were convinced however that the project had ensured that treatments given were now more effective. In the longer term this would result in cost savings to the business, with treatments being viable for longer on-farm, minimising the rise of resistance issues (as outlined the next section).

3.3 Test results regarding resistance issues.

Faecal Egg Counting (FEC) acts as an early warning sign and helps identify any emerging resistance issues on farm. It therefore provides the information required for farmers and vets to use the most effective worm treatment products.

3.3.1 Hendre Ifan Goch

Rhys and Russell immediately discovered drench resistance in the flock at the project outset. It appeared that the flock was 99% resistant to Triclabendazole (a fluke treatment). This allowed them to make the decision to house the pregnant ewes for 10 weeks. Housing the ewes for this period meant they were able to clear the fluke to zero, by using a Closantel product (such as Flukiver). Closantel was used to dose the ewes twice, 7 weeks apart which kills fluke down to the age of 5 weeks old.

3.3.2 Rhosgoch

The project allowed Gethin to recognise that there was resistance at varying levels to white (BZ) and clear (ML) drenches on the farm. Gethin undertook resistance testing on farm during July (refer to following table). This highlighted the significance of anthelmintic resistance and encouraged Gethin to purchase a fully effective treatment. A (LV) yellow drench was tested and proved to be effective. The next table

shows that the yellow LV drench was overall most effective at reducing both Strongyle and Nematode worm levels.

Resistance Testing Results July 2017

| Drench | START FEC | | | | END FEC | | | |
|--------|------------|---------------|---------|------------|---------------|---------|-----------------|-----------|
| | Date | Strongyle EPG | Nem Epg | Date | Strongyle EPG | Nem Epg | Strongyle Red % | Nem Red % |
| 1 BZ | 01/07/2017 | 525 | 245 | 15/07/2017 | 315 | 0 | 40 | 100 |
| 2 LV | 01/07/2017 | 700 | 420 | 08/07/2017 | 0 | 35 | 100 | 92 |
| 3 ML | 01/07/2017 | 350 | 140 | 15/07/2017 | 210 | 0 | 40 | 100 |

3.3.3 Tyn y Pant

In addition to monitoring FECs, an anthelmintic resistance profile was carried out. It revealed there is resistance to Yellow drenches at Tyn Y Pant. White, Clear and Moxidectin anthelmintic drugs appear to be effective. This is invaluable information for the Bennetts as they can now select effective wormers. Regular drench checks will be conducted to continue to monitor the drenches. Using effective treatments will help maximise lamb growth and improve profit margin.

3.4 SWOT analysis

| | |
|----------------------|---|
| STRENGTHS | <ul style="list-style-type: none"> Timely dosing achieves effective treatments and reduces cost/labour requirement Use of time for other farming practices Strategic rather than routine practice allows farmer to be in control of the flock Use of quarantine methods (Hendre Ifan Goch) |
| WEAKNESSES | <ul style="list-style-type: none"> Adverse weather conditions expose the flock to worm burdens Pasture on-farm has restricted growth during July. Stunted growth. Possible unreliability of FECPAK data Resistance to doses resulting in further challenges and more reliance on other management techniques Variation in summer and winter rainfall areas means every farm is unique and may not be as reactive to control methods in comparison to other farms Variable weather makes it difficult to predict the prevalence of parasitic disease |
| OPPORTUNITIES | <ul style="list-style-type: none"> New grass leys to help growth of grass late May (Hendre Ifan Goch) EBVS in rams to try and make lambs gain a higher DLWG younger (Hendre Ifan Goch) Provide pasture of lowest risk for weaned lambs to avoid high larval levels Opportunity to use more than one control method e.g. newly sown pasture, or alternative crops. Rotating grazing between cattle and sheep during the season dilutes the worm burden. Grazing on bioactive forages, such as chicory and birdsfoot trefoil, can reduce the negative effects of worms in sheep. Breeding for resistance to worms e.g. pedigree producers breeding for FEC Estimated Breeding Values (EBVs) – this means the progeny of their rams has the |

| | |
|---------|--|
| | enhanced ability to resist worm challenges once their immune system begins to work. |
| THREATS | <ul style="list-style-type: none"> • Lack of rain resulting in a poor growing season, meaning sheep have to be located to wherever there is grass available. • Poor grass growing season resulting in poor lamb growth rates. • Poor grass growing season resulting in lambs grazing very low sward heights, making the more exposed to infective larvae. • Poor weather conditions causing sheep to become stressed and more susceptible to infection. • Drench cannot be supplied when the buyer needs it, disrupting routine treatment therefore increasing risk of infection. • Increased further resistance to other anthelmintic drenches if strategic approach is not adhered to. |

3.4.1 Farmer perspectives of the project

All participants were very positive about participating in the project and have every intention to continue with the changes they have made to their farming system.

Russell and Rhys Edwards have found the project very beneficial to their sheep enterprise. It has opened their eyes to worm burdens and treatment timings/usage, and wish to continue dosing at strategically rather than routinely. However they are not 100% confident with the FECPAK results, especially with testing on lambs, so will discontinue this practice, but continue to liaise closely with their vet.

Gethin says: 'I am very pleased with the FECPAK system; it is easy to use and the results were returned quickly. The FECPAK team are very helpful and knowledgeable about the system. They query any results which seem unusual. I have great confidence in the results and want to continue implementing the system'.

The project has brought many benefits to the business, especially identifying anthelmintic resistance in the flock. Identifying and testing for anthelmintic resistance has allowed Gethin to use the most appropriate and effective treatment.

Gethin also has plans to use the FECPAK system on his cattle herd. Although Gethin did undertake some testing on the cattle, it was not as successful as he would have liked. Cattle were not continually tested or monitored as they were located too far away from his holding. During 2018, the herd will be located closer to the holding, allowing Gethin to prioritise testing and treating.

The Bennett family have found faecal egg counting an invaluable tool in helping them decide when to drench and when to avoid unnecessary treatment. Mrs Bennett stated 'The system has improved overall flock health; ewes are in better condition and the daily liveweight gain of lambs has increased. We are also making cost savings, by drenching less and reducing labour. It has not been as daunting and time consuming as we first thought, especially with the benefits it has delivered to our businesses.'

3.4.2 Alignment to the sector's strategic goals

This work contributes to the Welsh Red Meat Sector's strategic objectives⁶, specifically in relation to:

- Improving on-farm output from the red meat sector by at least 7% by 2020, by helping to contribute to increasing the national average flock performance.
- Develop and encourage flock health planning, disease prevention and effective quarantine practices to improve biosecurity and reduce the impact of disease.
- Enhance industry understanding of economic benefits of optimising animal health and improving efficiency through effective husbandry.
- Increasing the average weight of lambs produced per ewe in Wales, by at least 10% (to 56kg).
- Develop new business focussed programmes to improve the management, efficiency and profitability of Welsh red meat businesses.

4 Impact on the industry

4.1 Impact on individual business

This is covered in the Summary section of this report (Section 1).

4.2 Impact on wider industry

Refer to the Take Home Points for the Industry section in the Summary of this report.

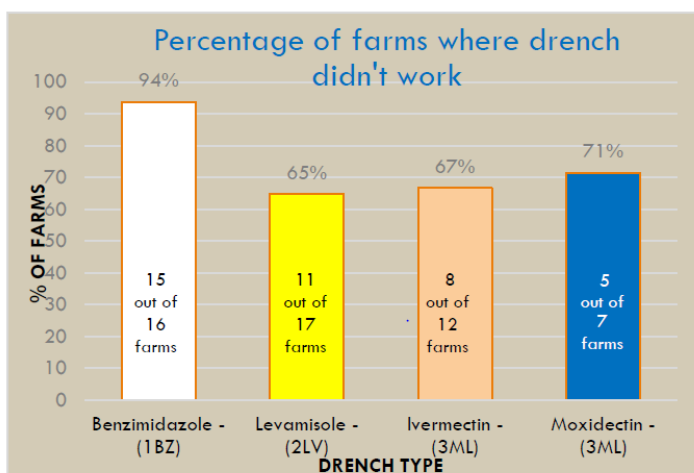
There is scope for the project concept to be replicated over sheep farms throughout Wales. The results from all 3 participating farms are excellent examples of how sheep farmers can manage their doses, dependant on faecal egg counts, reducing their doses, and/or timing their doses to ensure maximum efficacy, thus making cost and time savings.

Longer term, taking an industry wide responsible approach to ensure anthelmintic efficacy is essential, in order to ensure these treatments are effective for as long as possible. Wormer resistance has been detected on more than 80% of the farms that have been tested in Wales and across the UK⁷. Resistance to the benzimidazole (BZ) group is widespread and the incidence of levamisole (LV) resistance is increasing. Reports now indicate that resistance to the macrocyclic lactone (ML) group is also now occurring.

Data from the more recent Sainsbury FECPAK^{G2} Project provides a snapshot of resistance issues in Wales and the UK. A total of 52 tests on different drench types were successfully completed on 32 farms which is summarised in the graph below.

⁶ [Hybu Cig Cymru – The Strategic Action Plan for the Welsh Red Meat Industry](#)

⁷ HCC Are you winning the War on Worms booklet.



- The results show that most drenches from the older wormer families aren't working on most farms with 3 out of every 4 tests overall showing a failure.
- The level of efficacy varied from being 0% effective in reducing egg counts to 94% reduction which is the cut off point for determining effectiveness.

These recent snapshot figures indicate that farmers industry wide need to routinely FEC sample in conjunction with applying the SCOPS principles, in order to ensure treatments are effective for as long as possible in the Welsh flock.

4.3 Impact on Welsh Government's cross cutting and priority themes

4.3.1 Climate Change

Changes to the climate have also brought warmer, wetter weather patterns and increased the grazing season. This has also changed the pattern of worm populations. For example, *Nematodirus* is now not only seen in the spring but can also be seen in the autumn. *Haemonchus*, the Barber's Pole Worm, a tropical blood sucking parasite is now found throughout the UK despite not normally surviving well in colder northern climates. All of these affect the way that we treat worm infections.⁸

Climate change presents us with production challenges – the need to maintain production from as low a carbon emissions base as possible. Effective worm control plays an important part in optimising the outputs from our sheep, by reducing the impact of worms on growth rates, feed requirements and time to finishing as well as by reducing our use of chemical treatments.

4.3.2 Animal Health and Welfare (AHW)

Poor worm control in sheep flocks can result in major adverse effects on sheep flocks for example, permanent damage to the gut and depressed appetite and food intake.

Exercising good worm control and management promotes good animal health and welfare, resulting in reduced ill thrift and mortalities, thereby achieving a higher % of healthy flocks and successful sheep enterprises.

⁸ HCC Are you winning the War on Worms booklet.

4.3.3 Future Generations

Controlling on farm parasite burdens through adopting a routine monitoring system will reduce reliance on anthelmintics. With many farms facing challenges associated with anthelmintic resistance such practices will allow future generations to overcome worm burdens through a means of control as appose to treatment. Reducing challenges faced by the industry would hopefully inspire future generations to pursue or continue a career within the agricultural industry.

4.3.4 Tackling Poverty

Focusing on improving animal health and worm burdens on farm is a flock management tool that will improve flock health and wellbeing, reducing overall losses and resulting in higher productivity. 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 system have the potential to increase returns through increased income both on and off the farm.