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Focus Site Project Review

Moving to an outdoor lambing system

The Penwern Experience

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1 Summary

Rhun Fychan runs a 250 sheep flock, on a 64 hectares, at Penwern Farm, Cilcennin, near Lampeter. He works full time off the farm, and has used the Focus Farm opportunity to tackle a range of persistent health and performance issues in his flock. A key focus was getting the flock to a position where it would be a low cost, low labour input system, so that he is able to continue farming, and do this profitably, whilst also earning an income off-farm.

Business aspirations:

- To move from an high cost (money and time) indoor lambing system, to a robust, income generating outdoor lambing
- Establish a healthy flock, as a basis for expansion from 250 (2016) to 450 ewes (by end of 2018), whilst still working off farm
- Develop a flexible flock management system, which can adjust to available resources (i.e. labour availability, and weather patterns affecting grass growth and disease incidence).

With Rhun working off farm full time, and taking more land back in hand from 2016 onwards, tackling some persistent health issues and revamping the operation to work for him was a priority. The Focus Farm project provided the chance to put into practice what Rhun aspired to; an outdoor low cost system, with good flock health, and utilising his grassland better. Once this new regime has stabilised, it will provide a robust platform from which to increase flock size. This will result in increasing returns, with any increase in labour requirements being kept under control.

Focus Farm Project key objectives:

The aim of the project was to demonstrate the importance of good flock health planning and feed budgeting in a move from indoor to outdoor lambing. Project objectives included:

- A **move from indoor to outdoor lambing**, to reduce labour requirements at lambing.
- A more robust flock, with **lameness and abortion issues under control**.
- Associated with the move to outdoor lambing, **the establishment of a grass management system, producing high quality grass and silage**.
- **The establishment of a management programme** that is target driven, with regular monitoring of performance.
- Exploring **the value of data collection and use of technical expertise**, in order to achieve business goals (in this case, working with veterinary expertise, a grazing advisor, using a plate meter, blood testing and silage sampling).

1.1 Project Conclusions

Project results indicate that the overall move from an indoor to outdoor lambing system has provided the business with additional benefits, which will become even more apparent over the next few years of the new regime.

The transition to outdoor production has resulted in the flocks nutritional requirements being successfully met, as well as generating financial savings, reduced labour requirements and improved health status of the flock. However, further efforts will be needed to ensure a steady supply of winter grass, through the build-up of a grass wedge which will become important as flock size increases to ensure pastures are not understocked.

Project outcomes/learning points were:

a) Improved health status, particularly abortion rates and lameness

In previous years the farm had suffered from high abortion rates with cases of both enzootic abortions and toxoplasmosis. However, the decision to move to an outdoor lambing system has resulted in a dramatic reduction, likely due to little or no exposure to contaminated bedding. This risk could be further reduced with the introduction of preventive vaccinations such as enzovac and toxovac, to limit future chances of abortion outbreaks.

Considerable efforts have been made to reduce lameness within the flock, with the project adopting the 5 point plan (see below) to tackle the disease outbreak. Having previously culled 40 ewes with a poor foot rot scoring and treating those remaining ewes with Footvax in the autumn minimal cases of lameness have been identified. The data collected indicated no cases of foot rot were recorded, implying the current practices mitigated are proving successful in preventing outbreaks.

The 5 point plan for tackling sheep lameness.



- **Cull** to build resilience in the flock; essential in the 1st year of a lameness control strategy.
- **Avoid exposure** to bacteria, especially in handling and feeding areas (indoors and outdoors).
- **Treat** as soon as signs of lameness seen, within 3 days of becoming lame.
- **Quarantine newcomers** for a minimum of 28 days; treat problems before integration into flock
- **Vaccinate**, as part of a biannual whole flock vaccination programme (inclrams!)

<https://beefandlamb.ahdb.org.uk/wp-content/uploads/2015/06/BRP-Lameness-five-point-plan-110615.pdf>

b) Cost savings made

The pre 2016 system at Penwern involved the purchase of approx. 5 tonne of concentrates annually to ensure nutrition requirements were met, for increased productivity, growth and general health of the flock. However, with the new system focusing on the production on good quality silage and grassland, no concentrates were purchased throughout 2017.

Adjusting the winter forage is also likely to bring financial savings. Stubble turnips and kale had previously been grown, however these weren't successful in wet winters. The focus on grass will bring long term financial savings and increased confidence of a plentiful supply of forage over winter months available to the outdoor lambing flock.

The table below provides an indication of the cost savings/additional income the move to an outdoor lambing system has generated to-date for Rhun. The figures are based on Rhun's own estimates, and industry standards (such as those in Nix). They give an indication of the costs associated with the indoor system, and the savings that can be made from the outdoor system at Penwern.

	2016	2017	Savings/additional income made	Comments
Abortions	4 (7 lambs)	1 (2 lambs)	Assume 5 additional lambs, totalling £325 income.	Increased farm output Assumes income of £65 per finished lamb.
Still born lambs from mature ewes	18	0	18 additional lambs, equating to £1,170 extra income.	Increased farm output. Assumes income of £65 per finished lamb
Joint ill	20	9	11 healthier lambs, finished and sold, equating to £715.	Reduction in antibiotic treatment cost, and increase in survivability Assumes income of £65 per finished lamb
Lambing labour hours (approx.)	210	87	A saving of over 123 hours, for use elsewhere on flock management.	Based on minimum 5 hours/day for 6 weeks for indoors, and 2.5hrs/day for 5 weeks outdoors
Straw Cost	£350	£0	Minimum £300 (with high straw prices in 2017)	Minimal straw usage, as flock was lambed outdoors. Based on straw costs of £1.40 per ewe.
Silage cost of production £30/t FW	£750	£0	£750	Although silage not bought it, this provides a value of the savings made to the business, from lambing outdoors on grazing. Silage will still be made as an insurance feed for the flock, but

	2016	2017	Savings/additional income made	Comments
				also selling it will now be a possibility, as an alternative income stream. Assumes 4kg of silage saved per ewe per day, for 25 days.
Concentrate cost	£1,250	£0	£1,250	No concentrates required with the outdoor lambing system.
Total savings made			£4,510 in cost savings/income Circa 123 hours saved, equating to £1,230	Based on valuing a farmer's time at £10 an hour

c) Nutritional requirements met through improved utilization of grass

The previous grazing system at Penwern relied on additional supplementation to meet nutritional requirements of the flock. With improvements made in grassland utilisation it was recognised that all nutritional requirements could be met by grass or silage alone, as long as the lambs/ewes were split into grazing groups, in order to manage the grass wedge/nutritional supply effectively.

The move to a grass based system was supported by nutritional veterinary expertise, and a grassland specialist, who built a grazing management plan with Rhun, bespoke to the farm.

Ewe performance was tested via metabolic profiling, to get a clear perspective on ewe health. Although the protein status of all carrying ewes was successfully met under the new system, the same was not found when testing the pregnant ewe lambs. However, the veterinary advice was that this may reflect on issues concerning flock management as opposed to nutritional requirements. A recommendation were made that as a routine management strategy, all ewe lambs should be fed and grazed separate to pregnant ewes throughout the gestation period.

1.2 Next steps for Rhun –his perspective.

The move to outdoor lambing has been a **success as regards cost savings and health improvements**, particularly in relation to lameness, enzootic abortion and toxoplasmosis issues.

Accessing specialist grazing and veterinary **advice has been crucial in ensuring Rhun felt confident** about making these substantial changes to his sheep system.

Rhun has confirmed that he now needs to **let the new system settle in and prove itself**. He is only one year in and has made a range of alterations, so there is a lot going on! For instance, lamb weights were not a specific priority for this project, with the focus on being flock health and cost/labour efficiencies, but winter 2017 onwards, these project investments will need earn their keep, via increased lamb weights, increasing farm output.

Rhun will look to set 8 week weight targets, to help focus on output. Suggested target growth rates on grass based systems would be 250-280g/day.

Adopting the 'grass wedge' management principles into his day to day grazing management is a priority. The use of the plate meter has helped instil the principles of managing for sward height and quality, even though it is unlikely that Rhun will continue to use a plate meter to routinely measure his grass.

In order to ensure costs can continue to be kept down, **maintaining a steady supply of winter grass will be vital** as flock size increases, to ensure pastures are not understocked.

Keeping on top of lameness; **it has been beneficial actually implementing the 5 point plan principles.** As a general rule now, if the ewe needs treatment more than twice across the season, consider culling as one of the treatment tools.

Although the protein status of all carrying ewes was successfully met under the new system, there were some concerns regarding the pregnant ewe lambs (results from the metabolic profiling). Rhun will continue to **feed and graze the ewe lambs separate to pregnant ewes throughout the gestation period.**

Having established a more sustainable platform for the business to grow from, **Rhun can now look to increase the flock to his goal of 450 ewes,** making better use of his currently underutilised grazing.

1.3 Take home points for the industry:

Many sheep producers are considering moving from indoor to outdoor lambing but are concerned about how best to manage feeding the flock at grass pre-lambing and ensuring adequate grass availability post-lambing. Minimising flock disease levels which could undermine ewe performance and lamb survival are also a concern to those considering the move. An increase in lamb losses is often cited as a reason to avoid the move to outdoor lambing despite the cost-savings that can often be found in terms of bedding, conserved forage, concentrates and labour requirements.

However, provided due attention is made to health and nutrition and a comprehensive plan put in place before hand it is possible to both maintain and improve lamb survival and also to reduce flock costs.

It is tempting to continue using a traditional compound feeding system that has always worked for your sheep enterprise. However, without too much effort, significant cost savings can be made by assessing and adjusting your feeding regime.

Sheep farmers have the opportunity to better utilise home-grown forage to meet animal production requirements, thereby making savings and resulting in a more profitable enterprise.

a) **The financial value of changing to an outdoor lambing system.**

Opting for an outdoor lambing system allows for savings to be made in a number of different aspects, with a reduction in time associated with lambing practices being key. Savings are made in terms of time at feeding, bedding, assisting individual ewes as well as supervision time.

It is essential that that timing of lambing corresponds well with grass growth on each individual farm, and this needs investment, prior to the lambing period.

Providing the correct nutritional and energy requirements through grass will reduce the costs associated with concentrate supplementation whilst providing the necessary requirements for reaching and maintaining target condition, ensuring sufficient, good quality milk is produced and sustaining the health status of the flock both prior to and during lambing.

Establishing a lameness management plan such as the 5 point plan prior to making the change in management systems would benefit those considering adopting an outdoor lambing system. Although the initial culling of ewes may prove costly by reducing flock size, the reduction in costly medicines and improvement in flock health and wellbeing will provide an increase in the long term return of the flock.

In addition to this, outdoor lambing also reduces the risk posed by infectious diseases associated with contaminated bedding in indoor systems, reducing the overall veterinary and medicine expenditure.

b) What is required for managing an outdoor lambing flock?

- Analysis of the grass cover across the farm should be calculated to determine how much grass is available to the stock.
- If silage is given to ewes to meet nutritional and energy requirements before and when the lambs are born, then a silage analysis will be required to test silage quality. This will help ensure accuracy of feeding.
- Having scanned all ewes, group according to their nutritional requirements, which will correspond to the number of lambs being carried, with single bearing ewes requiring an alternative ration to twin and triplet bearing ewes. If lambing ewe lambs it is important they are kept separate to all other single/twin bearing ewes.
- Ensure ewes with good mothering ability are used, along with a terminal sire that is hardy with good survival traits, these will produce lambs fit for an outdoor lambing system.
- Increased vigilance should also be adopted in spotting for fluke and worms, with the use of faecal egg counts, and a strategic dosing regime, based on dosing according to incidence and weight.

More detail on the above pointers is provided in Section 3.3.

c) In which areas do you need to be more vigilant?

Keep an eye on fluke levels, as flock exposure with increased grazing days may be higher.

Keep an eye on condition score; although a lower condition score (2-2.5) should help reduce oversized lambs and difficult births.

Keeping on top of lameness; ensure you check stock every day, as lameness needs to be caught within 3 days of external symptoms showing.

d) There may be underlying health/nutrition issues in your flock that you can't identify via a physical or visual assessment –the value of metabolic profiling.

Metabolic profiling is a valuable method of assessing whether the diet for ewes pre lambing is providing enough energy, protein, calcium, magnesium and trace elements. It can identify issues that are not able to be assessed via visual and physical assessments, and provides evidence for making necessary dietary adjustments. In this project it was particularly useful in testing whether the new production system was meeting the ewes' nutritional requirements

In this case, metabolic profiling indicated that, 3 to 4 weeks before lambing, the ewe energy balance and digestible protein intakes were good. This provided robust reassurance to Rhun that his new system was providing the energy and nutrition required by the flock.

Once successfully established and maintained, based on Rhun's experience to-date, an outdoor lambing system will benefit the enterprise via:

- Reduced labour requirements
- Reduced bedding expenditure
- Reduced veterinary and medicine expenditure
- Improved overall health of the flock – with reduced abortion rates and lameness
- Improved grassland efficiency
- Reduced concentrate use and expenditure
- Reduced lambing period

2 Business Review

2.1 KPIs/business performance indicators

The key business performance indicators Rhun wanted to work on in this project were:

- Disease incidence within the flock
- Days of feeding
- Ewe and lamb losses
- Financial savings, relating to cost of feed/ewe and labour requirements
- Flock protein status via metabolic profiling

Progress against these is detailed under section 3.2 of this report.

2.2 Potential impact of the project on the business

The aspiration is that the system is low cost in comparison to the conventional indoor system previously used on the farm, and provides the basis for sustainable flock expansion. To see the full financial impact of the changes made, the business needs to let the new system bed in for a couple of years, however there are still some significant savings that have already been made, specifically as regards livestock losses, livestock health, and feeding/labour costs.

Savings already made to-date are outlined in section 1.1 of this report, and Rhun's aspirations and next steps are outlined in section 1.2.

3 Project Review

3.1 Aims of the project

- a) A **move from indoor to outdoor lambing**, to reduce labour requirements at lambing.
- b) A more robust flock, with **lameness and abortion issues under control**.
- c) Associated with the move to outdoor lambing, **the establishment of a grass management system, producing high quality grass and silage**.
- d) **The establishment of a management programme** that is target driven, with regular monitoring of performance.
- e) Exploring **the value of data collection and use of technical expertise**, in order to achieve business goals (in this case, working with veterinary expertise, a grazing advisor, using a plate meter, blood testing and silage sampling).

3.2 Project results and discussion

	KPI/performance indicator	What was the project result?
1	A move from indoor to outdoor lambing, to reduce labour requirements at lambing.	A saving of over 123 hours associated with lambing time, for use elsewhere either on or off the farm.
2	A more robust flock, with lameness and abortion issues under control.	A reduction in health issues, specifically, 50% less abortions, an eradication of still births, over 50% reduction in joint ill cases, and a near eradication of lameness issues on the farm, as a result of culling 40 persistent offenders, and using Footvax strategically. Also, a corresponding reduction in antibiotic usage; minimal usage now, in comparison to 20% of the flock in receipt of antibiotics pre 2016.
3	The establishment of a grass management system, producing high quality grass and silage.	The production of good quality silage on-farm, and an increase in kgDM across the fields, with the use of more strategic grazing. Fields grazed according to DM volumes, based on plate meter readings, and ewes grouped into multiples/singles/ewe lambs. Grazing days have increased by 25 days minimum, removing the requirement of circa 25 tonnes of silage. Lambing start date was moved from 1 st March to 1 st April to ensure sufficient grass available to meet nutritional requirements.
4	The establishment of a management programme that is target driven, with regular monitoring of performance.	Rhun is now able to be more clear about what to focus on (building up to 450 ewes), and how to get there (selection of thrifty ewe replacements, that are hardy with good milk and mothering abilities), as well as using targets such as 8 week weights to ensure good growth rates.

KPI/performance indicator	What was the project result?
5 Exploring the value of data collection and use of technical expertise	<p>As a result of the project, Rhun now records ewe productivity and has started using lamb weights more proactively, in order to assess performance. The investment of time and expertise, specifically around nutrition, grassland management and metabolic profiling has provided him with an excellent foundation on which to build his sheep enterprise.</p> <p>His actions, advised by the experts used, have helped release resources valued at a circa £5,700 per year.</p>

3.2.1 Making the move to an outdoor lambing system – the basic principles

- a) Analysis of the grass cover across the farm should be calculated to determine how much grass is available to the stock. To calculate the available grass cover, the pre grazing cover will need to be subtracted from the post grazing cover and multiplied by the grazing area (ha). To create a sustainable and quality grass cover stock must enter and leave the grazing area when target grass covers have been met. For grass to meet the requirements of grazing ewes grass availability should be 500 Kg DM/Ha, with 2,100Kg DM/Ha pre – grazing and 1.600Kg DM/Ha post – grazing¹.
- b) If silage supplementation is given to ewes to provide the correct nutritional and energy requirements before and when the lambs are born then a silage analysis will be required to test silage quality. The silage analysis will ensure correct nutritive values are present in the silage, and give an indication to what additional supplementations will be required if sufficient values are not present. It may be good practice to perform some metabolic profiling activities 3 weeks before lambing to investigate and possibly address the flock’s nutritional status whilst it is still safe to make small changes that may dramatically improve colostrum quality².
- c) Having scanned all ewes, group them according to their nutritional requirements, which will correspond to the number of lambs being carried, with single bearing ewes requiring an alternative ration to twin and triplet bearing ewes. If lambing ewe lambs it is important they are kept separate to all other single/twin bearing ewes. This will not only ensure ram monopolization does not happen, but ewe lambs will also require a higher ram:ewe ratio due to a shorter standing heat as well as ewe lambs being unlikely to actively seek out a ram. In terms of feeding requirements, ewe lambs will also require up to 20% more feed than those ewes in early to mid-pregnancy to sustain continued growth³.
- d) To increase the likelihood of achieving a successful outdoor lambing system it is essential to consider the flock’s breeding. Ensure ewes with good mothering ability are used, along with a terminal sire that is hardy with good survival traits, thus will produce lambs suitable for the desired lambing practice.
- e) Providing lambs are dry and well nourished, they should maintain their body temperature. It is advised that some form of shelter was offered within the field in all outdoor lambing practices⁴, if at

¹ <https://www.daera-ni.gov.uk/articles/grass-budgeting>

² <http://www.hccmpw.org.uk/medialibrary/publications/Feeding%20the%20Ewe.pdf>

³ Hybu Cig Cymru. (2007). Easier Management Systems for sheep. www.hccmpw.org.uk

⁴ [http://www.endellveterinarygroup.co.uk/pdfs/farm/press/AHA%20Magazine%20-%20Lambing%20\(April%202012\).pdf](http://www.endellveterinarygroup.co.uk/pdfs/farm/press/AHA%20Magazine%20-%20Lambing%20(April%202012).pdf)

all possible. Increased vigilance is essential as regards fluke and worm monitoring, using faecal egg counts routinely as outdoor lambing may increase the chances of such issues.

3.2.2 Metabolic testing results

Metabolic testing was undertaken pre-lambing (March 2017) to establish whether the ewe’s diet was providing enough of the following:

- Energy
- Protein
- Mineral Status

Metabolic profiling is a valuable method of assessing whether the diet for ewes pre lambing is providing enough energy, protein, calcium, magnesium and trace elements. It can identify issues that are not able to be assessed via visual and physical assessments, and provides evidence for making necessary dietary adjustments.

Blood tests for metabolic profiling were done on ewe lambs, single and twin bearing ewes, 3 weeks before the start of lambing. The results concluded that⁵:

	Results and recommendations
Energy balance	All of the ewe lambs, single carrying ewes and twin carrying ewes had good individual β -hydroxybutyrate (BOHB) results. The group mean BOHB results for all three were well below the interference level of 1.1 mmol/l for ewes that are being fed according to foetal number. The vet concluded that the energy balance in all three groups at 3 weeks before lambing was satisfactory.
Protein status	<p>Blood urea-N provides an indication as to the amount of Effective Rumen Degradable Protein (ERDP) in the ration. All of the urea-N results in the single carrying ewe group and the twin carrying ewe group were normal showing that ERDP intakes were good in both of these groups.</p> <p>The urea-N results in the ewe lambs were more mixed with three of the animals tested having low or marginal urea-N results. However, the group mean came out at 1.73 mmol/l and so the ration itself looked to be sufficient in ERDP supply.</p> <p>The interesting thing to note here was that according to the ration details provided, the ewe lambs and the ewes carrying singles were being fed the same silage.</p> <p>Vet advice was to consider flock management, and look to manage the ewe lambs separately to the mature ewes.</p> <p>The majority of the albumin results were normal indicating satisfactory long-term protein status. However, there were five low/marginal albumin results, and these were likely to reflect a chronic underlying disease problem such as fluke and/or PGE.</p>
Mineral status	<p>All magnesium results were good and so the overall magnesium content of the ration was considered satisfactory.</p> <p>The group mean copper results were all good, with no evidence of copper deficiency in the three groups of animals sampled.</p>

⁵ Results provided by the Dairy Herd Health & Productivity Service, University of Edinburgh.

Conclusions made, based on the above results were as follows:

Current energy balance and ERDP intakes look to be good in all three groups sampled with 3 to 4 weeks to go until start of lambing.

As mentioned previously, what to make of the urea-N results in the ewe lambs is worth further discussion as a lack of protein can potentially lead to problems with disappointing milk production and poor colostrum quality. It is difficult for me to explain these results given that the ration details for both the ewe lambs and the ewes carrying a single lamb are the same, what are your thoughts?'

3.2.3 Action taken as a result of the metabolic profiling work.

Rhun will aim to manage his ewe lambs and adult ewes separately in the run up to lambing in 2018. The metabolic profiling proved its worth in terms of being able to accurately assess whether the ewes' nutritional requirements were being met. Visual inspection would not be able to provide this level of reassurance.

3.2.4 Silage analysis and supplementation

Silage analysis is an essential tool in order to build up an appropriate and cost effective feeding regime, matching nutritional value of silage with ewe requirements, and addressing any supplementation issues, during the critical weeks pre lambing.

Based on the silage analysis results, the nutritionist was able to work with Rhun to advise what to feed and when, in the run up to lambing. First cut silage was used for single ewe lambs and single ewes, and second cut for all the multiples. Based on the metabolic profiling results, the ewe lambs were fed a bit more protein, and regular body condition scoring was done, in order to group and adjust feeding, as appropriate.

3.3 SWOT project analysis

STRENGTHS	<ul style="list-style-type: none">• A reduction in labour costs, industry estimates are for 30% labour savings can be made; in this project, savings over the lambing period for Rhun were indeed over 30%.• A reduction in concentrate cost (for Rhun from 2016 to 2107 this went from £1,250 to £0).• Meet nutrient requirements of the flock and not exceeded. Improve overall performance of flock.• Reduced likelihood of ewe deaths as a result of abortion.• Reduced likelihood of lamb death, as a result of still births and joint ill.• Near eradication of lameness issues, resulting in more productive ewes, and a reduction in routine/crisis veterinary treatment, as well as labour costs.• More production from grazed grass and home-grown feeds.• Rationing based on ewe body condition scoring results in less waste and inefficiency.• Use of time for other farming practices/non-farming activities.
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WEAKNESSES	<ul style="list-style-type: none"> • Initial costs including silage analysis, veterinary costs (blood sampling, fluke and egg worm counts), nutritionist, grassland advice. • Often wide variation in forage quality between farms and also within the same farm means that system has to be based on feed quality evidence; the importance of silage analysis, and assessing kg DM produced on a field by field basis. • Weather is changeable and unpredictable, which can quickly affect grass growth/quality and lower quality silage/yield produced. • Need to assess/anticipate mineral and vitamin requirements. A lack of supply of minerals and vitamins compromising body functions and decreasing overall lamb vigour. • Young ewes and shy feeders not separated results in lack of energy uptake –takes more effort separating ewes into groups. • With the priority on keeping ewe replacements to grow the flock, it will take a few seasons before an increase in production becomes apparent. • Looking after a high percentage of ewe lambs (necessary as a result of culling for lameness, and also with flock increase) means greater levels of vigilance as regards health and nutrition.
OPPORTUNITIES	<ul style="list-style-type: none"> • Opportunity to use freed up labour time for other flock management activity. • The value of metabolic profiling; identifying underlying health status issues before they become a major economic issue. • Encourages more proactive feeding adjustments by the farmer, to optimise production and keep costs down. • The ability to grow the flock sustainably, using home grown ewe replacements, using a robust outdoor management system.
THREATS	<ul style="list-style-type: none"> • Financial returns from increased volume of output may take a few years to become evident, and short term cash flow requirements may have to take precedence over decisions that would benefit longer term. • Parasites and stressful weather resulting in poor condition score of flock. • Poor growing year/weather conditions for grazing and silage crop will require adjustments • Energy per hectare used from grass is dependent on how much is grown, crop quality, how well it is preserved and how much is wasted when fed. This varies from farm to farm. • Understanding the quality of silage is critical to the success of any forage based feeding regime. • Wet weather conditions may promote the presence of liver and rumen fluke within the flock. • Poorly maintained grassland at crucial times can affect ewe condition, and has an impact on the volumes (and associated cost) of supplementation required.

3.4 Farmer perspective of the project

The move to outdoor lambing has been a **success as regards cost savings and health improvements**, particularly in relation to lameness, enzootic abortion and toxoplasmosis issues.

Accessing specialist grazing and veterinary **advice has been crucial in ensuring Rhun felt confident** about making these substantial changes to his sheep system.

Rhun has confirmed that he now needs to **let the new system settle in and prove itself**. He is only one year in and has made a range of alterations, so there is a lot going on! For instance, lamb weights were not a specific priority for this project, with the focus on being flock health and cost/labour efficiencies, but winter 2017 onwards, these project investments will need earn their keep, via increased lamb weights, increasing farm output.

Rhun will look to set 8 week weight targets, to help focus on output. Suggested target growth rates on grass based systems would be 250-280g/day.

Adopting the 'grass wedge' management principles into his day to day grazing management is a priority. The use of the plate meter has helped instil the principles of managing for sward height and quality, even though it is unlikely that Rhun will continue to use a plate meter to routinely measure his grass.

In order to ensure costs can continue to be kept down, **maintaining a steady supply of winter grass will be vital** as flock size increases, to ensure pastures are not understocked.

Keeping on top of lameness; **it has been beneficial actually implementing the 5 point plan principles.** As a general rule now, if the ewe needs treatment more than twice across the season, consider culling as one of the treatment tools.

Although the protein status of all carrying ewes was successfully met under the new system, there were some concerns regarding the pregnant ewe lambs (results from the metabolic profiling). Rhun will continue to **feed and graze the ewe lambs separate to pregnant ewes throughout the gestation period.**

Having established a more sustainable platform for the business to grow from, **Rhun can now look to increase the flock to his goal of 450 ewes**, making better use of his currently underutilised grazing.

3.5 Alignment to sector's strategic goals

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

- Develop new business focussed programmes to improve the management, efficiency and profitability of Welsh red meat businesses.
- Establish mechanisms that will maximise outputs from grass based systems and reduce reliance on bought in (imported) feed.
- Develop and encourage flock health planning, disease prevention and effective quarantine practices to improve biosecurity and reduce the impact of disease.
- Inform/educate the industry about cost saving/conservation, energy and water efficiency, ways to reduce waste and ways to improve knowledge, openness and transparency.

4 Impact on the industry

4.1 Impact on individual business

For the full summary list of the impact of the project on the business, refer to the Project Conclusions in section 1.1 of this report.

The project has revealed that there are significant cost, time and labour savings to be made when moving to an outdoor lambing system, summarised below.

- A healthier sheep enterprise, particularly in relation to lameness, abortion, still birth and joint ill issues.
- Less labour (one man band) and increased time efficiency
- Focus on managing ewes based on condition scores -results in a more targeted approach to flock management, reducing wastage.
- Focus on attention to detail, specifically as regards grass and silage quality and nutritional requirements.
- The more production is derived from home-grown forage and grazing, the cheaper the system will be to operate and the more margin will be made⁶.

4.2 Impact on wider industry

Take home points for the industry are as follows (also provided in the Summary section of this report).

a) The financial value of changing to an outdoor lambing system.

Opting for an outdoor lambing system allows for savings to be made in a number of different aspects, with a reduction in time associated with lambing practices being key. Savings are made in terms of time at feeding, bedding, assisting individual ewes as well as supervision time.

It is essential that that timing of lambing corresponds well with grass growth on each individual farm, and this needs investment, prior to the lambing period.

Providing the correct nutritional and energy requirements through grass will reduce the costs associated with concentrate supplementation whilst providing the necessary requirements for reaching and maintaining target condition, ensuring sufficient, good quality milk is produced and sustaining the health status of the flock both prior to and during lambing.

Establishing a lameness management plan such as the 5 point plan prior to making the change in management systems would benefit those considering adopting an outdoor lambing system. Although the initial culling of ewes may prove costly by reducing flock size, the reduction in costly medicines and improvement in flock health and wellbeing will provide an increase in the long term return of the flock.

In addition to this, outdoor lambing also reduces the risk posed by infectious diseases associated with contaminated bedding in indoor systems, reducing the overall veterinary and medicine expenditure.

b) What is required for managing an outdoor lambing flock?

- Analysis of the grass cover across the farm should be calculated to determine how much grass is available to the stock.
- If silage is given to ewes to meet nutritional and energy requirements before and when the lambs are born, then a silage analysis will be required to test silage quality. This will help ensure accuracy of feeding.
- Having scanned all ewes, group according to their nutritional requirements, which will correspond to the number of lambs being carried, with single bearing ewes requiring an alternative ration to twin and triplet bearing ewes. If lambing ewe lambs it is important they are kept separate to all other single/twin bearing ewes.

⁶ <http://www.nutrientmanagement.org/what-we-do/tools/feed-planning-for-sheep-and-cattle/>

- Ensure ewes with good mothering ability are used, along with a terminal sire that is hardy with good survival traits, these will produce lambs fit for an outdoor lambing system.
- Increased vigilance should also be adopted in spotting for fluke and worms, with the use of faecal egg counts, and a strategic dosing regime, based on dosing according to incidence and weight.

More detail on the above pointers is provided in Section 3.3.

c) In which areas do you need to be more vigilant?

Keep an eye on fluke levels, as flock exposure with increased grazing days may be higher.

Keep an eye on condition score; although a lower condition score (2-2.5) should help reduce oversized lambs and difficult births.

Keeping on top of lameness; ensure you check stock every day, as lameness needs to be caught within 3 days of external symptoms showing.

d) There may be underlying health/nutrition issues in your flock that you can't identify via a physical or visual assessment –the value of metabolic profiling.

Metabolic profiling is a valuable method of assessing whether the diet for ewes pre lambing is providing enough energy, protein, calcium, magnesium and trace elements. It can identify issues that are not able to be assessed via visual and physical assessments, and provides evidence for making necessary dietary adjustments. In this project it was particularly useful in testing whether the new production system was meeting the ewes' nutritional requirements

In this case, metabolic profiling indicated that, 3 to 4 weeks before lambing, the ewe energy balance and digestible protein intakes were good. This provided robust reassurance to Rhun that his new system was in the main, providing the energy and nutrition required by the flock.

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

Climate change

The increasing cost of imported feeds will make maximising the use of home grown forage and grazing to formulate feeding regimes -based on silage analysis data- increasingly important.

Ensuring standards of animal welfare are high will improve feed efficiency and reduce inputs. A healthier animal, less reliant on veterinary inputs, is a more efficient and low cost production system, with corresponding lower emissions per kg meat produced.

If the principles of this project are adopted more widely, they will contribute to a reduction in emissions from feed production and transportation. This will help reduce nitrogen use and methane production per unit of milk and meat produced across the sector as a whole⁷.

Animal Health and Welfare (AHW)

The project has shown that tackling lameness issues using the 5 point plan, with vaccination as the strategic treatment of choice, rather than routine usage of antibiotics, has proven benefits, both in terms of flock health and economics.

Outdoor lambing has also helped get on top of health issues associated with proximity to contaminated bedding, and tackle joint ill incidence.

⁷ <http://www.nutrientmanagement.org/what-we-do/tools/feed-planning-for-sheep-and-cattle/>

It has also helped evidence the value of metabolic profiling in understanding the disease incidence and nutritional status of one's livestock.

Future Generations

The project encourages young farmers who are working or looking to work in the sheep industry to be forward thinking and to grasp opportunities to run a business more efficiently. This includes reducing cost, labour and time; all are increasingly important post Brexit in such a volatile industry.

Tackling Poverty

Running flocks more efficiently will allow businesses to use time more wisely and to be able to focus on elements such as flock health resulting in increased productivity. More cost efficient business practices result in the potential for increased returns, whether that be from on or off farm income.