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KTIF Project Name: Grass to Milk Organically

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Final Report

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1. Project Title/Applicant

1.1 Project Title: Grass to Milk, Organically

1.2 Overview of Applicant:

Scottish Organic Milk Producers (SOMP)

Scottish Organic Milk Producers is a marketing co-operative of 21 dairy farmers who manage the supply of organic milk in Scotland from grass to glass. Founded in 2003 its core milk fields are in Dumfries and Galloway, central Scotland, Aberdeenshire and Inverness. Its purpose is to represent the commercial interests of Scottish organic milk producers and to add value to members' organic milk.

SOMP were successful in tendering for support towards improving the profitability and resilience of producers of organic milk in Scotland in 2017 and are pleased to be reporting the project's success.

1.3 Overview of external contractor:

SAOS

Established in 1905, SAOS are Scotland's experts on farmer co-op's and supply chain collaboration and provide a range of specialist information, development and consultancy services aimed at shaping the future of farming and food in Scotland.

Its purpose is to strengthen the profitability, competitiveness and sustainability of Scotland's farming, food and drink and rural economies through the promotion of co-operation and collaboration.

SAOS is a not-for-profit development organisation owned by its membership. As a membership organisation SAOS is committed to driving growth within agriculture and food co-operatives and stimulating collaboration within their supply chains. Innovation and co-operation are at the heart of its objectives to achieve added value and production efficiency, as is its proven role in smart project management and industry initiatives.

1.4 Overview of external contractor:

LIC Europe Ltd

LIC Europe Ltd is a technology company specialising in dairy genetics, production system consultancy and farm efficiency technologies. It is a subsidiary business to LIC NZ, a large co-operative owned by New Zealand dairy farmers.

After a tender process, SOMP contracted LIC Europe to facilitate the "Milk from Grass, Organically" project.

LIC "Pasture to Profit" Consultant Bess Jowsey completed this facilitation on behalf of LIC Europe. Bess has worked for LIC Europe in North England and Scotland for 10 years, managing and facilitating farmer discussion groups and working with dairy farmers on an individual basis. Her area of expertise is in pasture-based milk production systems, with a strong emphasis on sustainable and resilient profit.

2. EXECUTIVE SUMMARY

2.1 Overview

WHAT:

'Grass to Milk, Organically' was a project intended to and was successful in supporting the members of the co-operative 'Scottish Organic Milk Producers' (SOMP) in their understanding and confidence in the management and utilisation of pasture in their organic dairy farming production systems.

WHY:

There is a strong relationship between the utilisation of pasture, farm resilience and profitability. This is primarily because grass is by far the cheapest feed available for dairy cows. Grass is the most reliable and abundant forage available to Scottish organic dairy farmers but unfortunately, there is a large knowledge gap in how to successfully manage grass across the season, that maximise both its productivity and its potential for cheap milk production.

WHO:

There are 21 farming businesses in the SOMP membership. Of these, the project has regularly engaged with 15 farming businesses.

WHEN:

The Co-op was awarded the grant in December 2016 and commenced in January 2017, with an initial end date of December 2019. The first meeting of the project was held in April 2017 and so an extension was granted to finish the project in March 2020 which allowed a natural conclusion covering 3 full grass growing seasons. The final on farm meeting was unfortunately postponed due to the Covid-19 pandemic and instead it was completed online in April 2020.

HOW:

The project intention was to deliver a series of 12 on-farm meetings across a three-year period. This ended up being 11 on-farm and 1 online meeting due to Covid-19 over a three-year period. All 12 meetings were completed.

The content was delivered in a discussion group model – designed to encourage engagement, questioning, and the sharing of ideas and experiences (as opposed to a one-way lecture approach). Discussion groups are by far the most effective form of knowledge transfer in the farming, as individual farmers show a higher level of trust and are much more likely to instigate positive change by seeing and discussing it with other farmers (peer-peer learning).

The project covered the following topics:

- The value of pasture – what is it worth to you to manage it better?
- Measuring and allocating pasture/using a plate meter.
- Grazing management across the seasons.
- Grass management under challenging climatic conditions.
- Feed budgeting.
- Grazing infrastructure.
- Getting the most out of your animals using pasture.

Each host farmer also had the opportunity to discuss topics which were prudent to their farm business and received feedback from the consultant (LIC) and the group on where to target positive change (see Appendix 3).

Following each meeting a summary report was circulated via email and added to the project website to allow further reference for those who attended and a means to catching up for those who were unable to attend (along with any other hand-outs or resources from the meeting).

An online forum was set up on the website, along with a WhatsApp group to allow easy interaction and discussion between on-farm meetings. These were all well received, and in particular the

WhatsApp group, which was used to share grazing images, grass management scenarios and general advice from fellow members.

GOALS:

- Improve farmers understanding of the value better pasture management can have in their farm business as grazed grass is by far the cheapest feed available to all livestock farmers (and feed costs are one of the largest costs for a livestock farming business)
- Increase farmers confidence to utilise grazed grass and subsequently reduce reliance on bought in feed
- Give farmers strategies to assist in their pasture management across the different seasons to extend the grazing season and better deal with the challenges of the Scottish climate
- Introduce farmers to technologies that will assist them with pasture management and decision making to achieve the goals above

TANGIBLE RESULTS:

- All members who actively participated in the project increased their normal grazing season by 1 – 2 months
- The vast majority of farmers who actively participated have improved their Milk from Forage
- There is a general trend showing a reduction in the use of concentrate/cow
- Most businesses who were actively involved maintained or increased farm milk output
- All members who have actively participated in the project have invested in grazing technologies and infrastructure

Further explanation is available in Section 9 Key Findings

3. PROJECT DESCRIPTION

The aim of this project was to improve the profitability and resilience of producers of organic milk in Scotland. The group used innovative techniques to work together in order to share learning and data they produce around the optimum use of grass and improved husbandry techniques.

This project was innovative for a number of reasons. Firstly, the group took an inclusive approach to on-farm meetings. Members volunteered to open up their farm to fellow members to share, learn and benefit from the expertise which is available through the facilitator and other group members. This is a new approach to a 'monitor farm' set up whereby more than one farm benefits from the learning experience. Generally, the bulk of attendees at the on-farm KT events come from a 30-minute radius of the host farm. Due to the geographic spread of organic milk producers in Scotland, they are disadvantaged by not having local access to information events which are specific to organic and dairy. By moving the meeting venue and filming the sessions around the country, the learning was shared far and wide.

Knowledge is power, and when initiating this project, the membership knew that investment in new technology would have to be made in order to gain the best possible output from the opportunity. SOMP were able to subsidise 8 plate meters at a cost of £200 per member for members who were willing and enthusiastic about participating. LIC were able to provide 'one to one' and 'one to many' training opportunities on how to use the technology (plate meters and grazing platform programmes) to allow the members to start making data aided decisions easier, and therefore making more efficient and informed choices to maximise output.

Additionally, a support system for the mentoring of new entrants to the organic sector was facilitated. Currently there are no formal methods for ensuring that new entrants to the sector can access knowledge and experience from existing organic dairy farmers. By understanding the needs and farm systems of the new entrants, new members had access to experienced farmers who had overcome many of the problems they face. Throughout the project, support and guidance was offered in a practical, open, friendly basis.

4. FINANCE

4.1 To deliver the programme a grant application of £61,440 was made to the Knowledge Transfer and Innovation (KTIF) Fund. This grant source is jointly funded by the Scottish Government and the European Union. 100% funding was secured.

4.2 Detail of spend – for full budget breakdown see Appendix 1

	Budget	Total Spend	Over/Under spend
SAOS Project Management	6,000	5,680	-320
IT Development Fund	6,000	0	-6,000
Facilitation Time	19,200	17,140	-2,060
Expert Speakers	6,480	0	-6,480
Soil/Grass Analysis	4,800	507	-4,293
Filming/Prod Costs	9,600	9,949	349
Tech Training	1,800	360	-1440
Forum Setup & Management	2,400	3,950	1550
Mentoring Support	1,200	475	-725
Catering	2,160	1,403	-757
Dissemination of Info	1,800	4,140	2,340
TOTAL	£ 61,440	£ 43,604	£17,836

4.3 In total there was an underspend of £17,836.

Main areas

Expert speakers:

Meetings were already full of project delivery and farm walks, therefore, there was little time to fit in additional expert speakers. Members on some occasions were traveling up to five hours to attend an on-farm meeting, and so the time allowed on farm with the host and facilitator was already considerable.

There were a number of occasions external speakers did contribute to the programme, but these were pro bono so incurred no cost.

Grass Analysis:

Selected farmers were encouraged to send regular sward samples in for analysis, however, the follow through on this was lower than budgeted.

IT Development Fund:

Initial discussions to create a link between one of the milk processors and Agrinet were held. Creating the link required some software programming to be written. In the meantime, farmers were encouraged to manually enter their milk production information after a farm walk, if they were using Agrinet; or calculate it for themselves before meetings.

As farmers track and monitor production through their own milk processors technology, uploading it on Agrinet was duplicating the data which seemed of less value. To complicate things further, new GDPR legislation was introduced, along with a change in personnel at the milk processors.

In the end it became standard practise for the group to manually input the data or calculate it before the meetings. The main benefit in calculating this milk production figure is to compare with other farmers who have a similar production system as to how much the herd is producing in relation to the amount of grass in the diet at that time. The fact that this link was not created has not diminished the value of the Project in any way. It is, however, a missed opportunity for the processor to offer this option to their members.

5. PROJECT AIMS/OBJECTIVES

The overriding objective is to bring innovative and new thinking to the group to improve grass management and herd performance.

Proposed Objectives

- To allow members to accurately compare their business performance
 - Through sharing of information on grass growth
 - Business costings
 - Sharing knowledge on systems and processes which deliver successful businesses
- Provide members with training and access to modern technology
 - Accurate grass measuring equipment
 - Apps and programmes to aid grass management with this information
 - Potential to link grass growth and quality (from individual fields) to milk output for greater control
- Host on-line group tutorials and expert guidance
 - While still giving a personalised learning experience
 - By sharing learning, the group will pool their knowledge and ensure that knowledge is embedded, and support can continue to be provided beyond the project's life.
- Increase efficiency, particularly milk from grazed grass, reducing the need for cereals, maize and costly purchased feed.
- Encourage succession by giving younger members and employees the tools and confidence to run a profitable business.
- Allow potential new entrants access to experienced farmers for mentoring and advice.

6. PROJECT OUTCOMES

6.1 Pertaining to Aims/Objectives

- 4 Meetings per year (12 in total)
Meetings were held by rotation at member's farms, looking at specific issues on farm and solutions to resolve them. Each farm had a pre-meeting visit to assess how to achieve the best group learning from their meeting.
- At each meeting the current grass and production situation was collected and discussed, with particular reference to comparing the efficiency of that production from grazed grass (essentially how much of that production is coming from grazing vs more expensive feeds). We would share the data from those farmers using Agrinet (pasture software) and talk about what decisions might

need to be made given the current situation and grazing goals coming up.

- While each meeting centered around grass management as was applicable to the time of year there was a variety of discussion topic that took place, including sharing things that were currently a challenge or things that had been particularly successful. For example one farmer may mention that he was struggling with somatic cell counts; inevitably they weren't the only one, so a general discussion stemming from the positive and negative experiences of attendees would take place to try and assist these farmers to solve that issue. Likewise, the sharing of success – particularly relating to grazing – was found to be a great way to engage and inspire positive change.
- An objective that was difficult to realise was to create a traceable link between current production and individual field grass growth and quality. A biological system is so dynamic that there are many factors at play which will impact milk output. For example the cows broke over the electric fence and filled themselves with only the best bites of grass, therefore there was a positive milk response, however this was followed by having to get the cows to regraze the area and consume what they had left, which resulted in a decrease in output. Or the cows were short of water due to a leak and therefore the decrease in milk output had nothing to do with grass quality. Naturally a farmer who is block calving will have higher output at one time of the year vs another – again, nothing to do with the quality of the grass, but the stage of lactation of the herd. There was however an inferable link between the basic grazing principles governing pasture quality and milk output. Many times, we discussed that when the cows grazed the grass at the correct level, milk went up and they were able leave the right amount of grass to ensure similar quality on the next rotation. A number of times we discussed that fact that cows weren't producing or utilizing grass as well because they were going into grass that was beyond optimal for milk production. Sometimes the milk output reflected how that grass has been managed on previous rotations, so the learning was to taken action earlier to avoid this happening again.
- Where possible meetings or sections of meetings were filmed and made available online. Live streaming would have been hugely beneficial for members who were unable to attend, however, reliability of network in rural areas restricted this opportunity.
- A SOMP members website has been established to allow continual and ongoing interaction. This includes an online forum for discussions to take place, a centralised area for meeting summary reports, videos, photos and resources to be stored and accessed (password protected). This will continue beyond the life of the project.
- Training and resources offered on the use of grass measurement equipment and software 'How to' guides on the grass management software is available on the software website and one to one tutorials (sometimes on-farm, by phone or online) were provided to farmers who required further assistance to get pasture monitoring up and running.
- Two case studies have been reported, highlighting the work of the project and the benefits it has brought to these businesses. (Appendix 6 and 7)

6.2 Milestones

1. No of farmers attending meetings (Target 15)
 - 15 businesses actively engaged; Avg no. farmers per meeting 16 (see Section 8 for detail).
2. No. of farmers viewing materials online, either live or replayed (Target 10):
 - 7 farmers subscribed to forum.
3. No. of farmers measuring grass and uploading data (Target 12):
 - 13 members using platimeters, 9 members actively using pasture management software.
4. No of farmers sharing milk and grass data (Target 12):

- 7 farmers linked on Agrinet pasture management software; milk information link hasn't been taken up due to GDPR and its replicating data farmers get elsewhere.
- 5. No of Litres of organic milk produced from forage by the group (Target 10% increase):
 - 11% avg increase in milk from forage – increase from 45% to 56% (see Appendix 2).
- 6. No of organic milk producers in Scotland, including those in conversion:
 - SOMP membership has increased by two since the project began, bringing the number of members to 23.
- 7. Increase in profitability of organic milk producers in Scotland.
- 8. Increased use in technology and data to inform management decisions.

7. LESSONS LEARNED

7.1 Issues/Challenges

- The geographical spread of members is considerable across this group. When on-farm meetings are the main source of KT, it can become difficult to keep everyone moving at the same pace. However, the WhatsApp group and online forum allowed members to watch short video clips and read the farm summary report. LIC were also available out with meetings to clarify any points for members.
- The variation in engagement from members and use of communication technology between meetings was a challenge, as members have different levels of technological capability (and capacity).
- When farmers can choose to opt in or out of a programme (fully subsidised) the adoption of ideas and use of technology has not been as successful as if they had to pay for the opportunity – putting some 'skin in the game' seems to encourage greater commitment.
- Variation in grass growth across the season/years has provided many valuable learning opportunities in relation to pasture management – and those who are not as engaged in measuring have missed opportunities to improve their decision making.
- Realisation of how difficult it is to effectively manage grass without good grazing infrastructure, particularly in challenging weather conditions (each year had its own challenges!).
- The use of the online forum has been low, however, the SOMP grazing WhatsApp group seems to have been a much easier and more immediate for farmers to engage with other members and is frequently used to share comments, questions, photos and resources.
- Evidence from grass analysis show that there are times when the protein in a typical organic sward could limit milk production, this is something organic farmers need to be mindful of.

7.2 Impacts

- It has been humbling to see the immense progress members have made – particularly members who perhaps are not so forth-coming at meetings. It is great to see the discussion group ethic catering to all levels and is powerful enough to instigate positive change even in those who are sceptical or reluctant.
- Without collecting detailed carbon calculator data, it is difficult to determine any specific environmental benefits of utilising more pasture; but it is not hard to infer that there certainly will have been benefits gained for example, if farmers have produced the same or increased

output from less bought in concentrate; and particularly soya, the additional output has been achieved from home grown forages. It is easy to deduce how the environmental footprint of bought in feed would greatly exceed that of home-grown forage, particularly grass.

There is also research evidence to suggest that rotational grazing is a soil conditioner; meaning that rotationally grazed grassland has better soil organic matter, structure, water retention and active soil biology than many other agricultural uses for land – this is true for both conventional and organic farming practises. Rotational grazing builds soil organic matter – which is a whole area of carbon capture that is scientifically still in its infancy, but the current rule of thumb is increasing soil organic matter by 0.1% sequesters 9 tonne per hectare of carbon from the atmosphere.

- Generally, members who still have a long farming career ahead of them or another generation coming through, have been more engaged and committed to attending – this indicates that these farmers really value what they were learning and see it as an important component of staying viable in the future.
- Now that members have a better understanding of each other's businesses, they are continuing the grazing discussion group and are in the process of adding financial benchmarking to further improve their knowledge transfer.
- The realisation of the resilience of organic pasture across all types of climatic conditions; and how it can recover from damaging/extreme events by using stock management techniques to limit the impact.
- Between the months of May and July the group have learnt that it is worth sward sampling fortnightly to ensure protein isn't limiting milk production.
- Almost every host farmer has invested in grazing infrastructure to help them manage pasture better now that they understand the value of what it will get them – this infrastructure will pay back year after year.

8. COMMUNICATION & ENGAGEMENT

8.1 Detail throughout the project's lifetime

- Email communication group (24 members). Emails of meeting summary reports followed each meeting.
- WhatsApp communication group (15 members). Regular correspondence and discussion via the WhatsApp group between meetings.
- Text Communication group (19 members) - used predominantly for meeting reminders/attendance.
- Physical on-farm meetings have engaged with 37 farmers/farm staff & 8 industry partners. Meeting attendance register below.

Meeting Member Initials	Attendance											Register
	12-04- 2017 On- farm	15-06- 2017 On- farm	22-08- 2017 On- farm	17-10- 2017 On- farm	16-01- 2018 On- farm	25-04- 2018 On- farm	06-07- 2018 On- farm	03-10- 2018 On- farm	26-02- 2019 On- farm	01-05- 2019 On- farm	18-09- 2019 On- farm	08-04- 2020 Online
AH											y	
AR												
AC	y	y		y		y		y			y	Y
AdR	y			y					y		apologies	Y
CC												
DF												
DH	yy	yy	y	yy	apologies	yy	y	yy	apologies	y	y	
DR	y											
G/JL	yy	apologies	y	yy	apologies	y	yy	yy	yy	apologies	apologies	
IR	y	y	yy	y	yyy	apologies	yy	y	yyyyy		apologies	Y
J/GJ	yy	y	apologies	yy	yy	yy	yyy	yy		yy	yy	Y
J/I M	y											
KM/SB	y	apologies	y	yy	apologies	y	y	yy	apologies	y	apologies	y
MH	y	apologies		y				y				
SBs	yy	y	y	y	apologies	yy	y	y	apologies	y	apologies	
MM	y	apologies	apologies	y	apologies			y	apologies	apologies	apologies	
M/JB	y	yy	apologies	y	apologies	y	y	y	apologies	y	y	YY
RP/ CW	yy	yy	yy	yy	yy	yy	yy	y	apologies	y	y	Y
W/A/AW	yy	yy	yyy	yyy	apologies	yy	y	y	yy	apologies	yyy	YY
R/SJD	yy	yy	yy	yy	y	y	yy	y	apologies	y	apologies	Y
		Emily (vet student)				Sinclair Simpson	Angus Gaudie	Anna Robertso n	Craig Brown		Anna Robertso n	
		Mr Brown Snr				2x Kelso farmers	1 x Kelso farmer	Bryce Cunningh am	William (Ian Service)			
									Sam Robinson			
shaded cell was meeting host									2x industry partners			
Total	25	16	14	21	9	20	21	23	17	10	12	12

9. KEY FINDINGS & RECOMMENDATIONS

9.1 Key Findings

TANGIBLE RESULTS Data in Appendix 2

Extra days grazing achieved

All members who actively participated in the project have increased their grazing season by 1 – 2 months.

- There is international evidence that increasing grazing and grass utilisation in temperate climates has a strong and reliable relationship with farm profitability.

- AHDB research shows that every extra tonne of grass dry matter per hectare utilised lifts average farm profitability by £334/ha. It is likely that the extra 1 – 2 months of extra grazing equates to an extra 1 – 2.5 tonnes of grass dry matter utilised (£334 - £835 profit/ha).
- This additional profit from extra grazing comes from a mixture of reducing feed costs and reducing cow housing costs (such as bedding, scraping, dealing with slurry, fuel and machinery costs, feeding out and labour). When cows are grazing they feed themselves, spread their own slurry, make their own beds, and depending on the farm layout they can also walk themselves to and from work (milking)!!

More milk from forage

The vast majority of farmers who actively participated in the project have improved their Milk from Forage figures.

- Milk from forage has improved by an average of 11% across the length of the project.
- This equates to an average of 480 l/cow more milk from forage.
- Over half of them are achieving or exceeding the industry target of 50% milk from forage.
- All of them are now achieving above the UK average milk from forage of 33% (whereas at the start of the project half of them were below this level).
(UK Average MfF from Kingshay Dairy Costing Annual Report 2020)

General trend of reducing concentrates per cow

Cow concentrate is a term describing dense high dry matter high energy feed consumed by cows. The majority of cow concentrate is purchased from off farm (feed such as grains, soya, blended pellets called cake) and are typically 3 – 7 times more expensive than grazed grass for organic farmers).

- The general reduction in the use of concentrates is a physical manifestation of the increased confidence farmers taking part in the project have gained in the value of grass.
- This, combined with the increased milk from forage demonstrates they have substituted concentrate with grazed grass, and produced that proportion of milk much more cheaply
- One quote from a farmer was *“we have saved over £50,000 in purchased feed costs in the last year, and the cows are producing just the same”*.
- Variation between farms and across years are reflective of the different production systems and how seasonal climatic variation affecting pasture growth can relate directly to the amount of concentrate used per cow.
- Concentrate use can also vary dramatically as a conscious strategic on farm decision made in relation to milk price – effectively its not worth producing the milk if you are not selling it at a profit, so some production systems allow the flexibility to reduce concentrate and output to ensure a higher margin per litre sold.

Farm productivity has been maintained or increased whilst improving milk from forage

- Dairy farming is a biological system which means cause and effect is never straight forward.
- There is no relationship between per cow production and profit therefore as a measure it is only a useful benchmark on an individual farm from one season to the next and its relationship with forage efficiency (milk from forage).
- Output per hectare (or total output) does have a relationship with profit; therefore litres/ha or kilograms of milksolids/ha (kgMS) is a better measure to ensure the profitability of decision making.
- **Those farmers who started the project with low milk from forage figures have all reduced concentrate whilst increasing per cow production & total output** – this is the ultimate demonstration of the value of pasture.
- Some of the farmers have maintained or reduced per cow production whilst maintaining or only slightly improving their milk from forage figures – in these cases the farmers have increased their herd size so overall farm output has increased during the course of the project, effectively meaning the ‘extra cows’ are being fed entirely from the improvement in grass productivity and utilisation.

- One farmer introduced a group of Jersey cows to his Holstein Friesian herd – this lowered per cow production in litres significantly but increased fat and protein production – overall farm output and per cow production in kgMS increased by the end of the project.
- One autumn calving farmer who relies heavily on high quality grass silage for his winter milk production had poor quality winter forage following the challenges of the 2018 drought. Along with this he had a higher proportion of young cows enter the herd and was dealing with significant internal parasite issues all at the same time; this culminated in a drop in milk output for 2018 and into 2019.

On completion of the project, the group were asked seven short questions to assess the overall impact the project had on their farming businesses. The findings are as follows:

- Before the project was initiated more than half of those who responded were neither actively monitoring or managing grazing on a frequent basis, with some not managing it at all.
- At the end of year three, all those who responded to the survey are now frequently and many religiously monitoring and managing their grazing platform, which is a huge success of the project and the lead facilitator Bess.
- The group have increased their knowledge and skills significantly over the project lifespan with one farmer saying *“We’ve had a change in mind-set; moving away from high input and we’re no longer ‘actively avoiding grazing!’”*. This has had a significant impact for many of the farm businesses as many have commented on their confidence in making key decisions has increased with their new and improved technical and practical knowledge.
- The group are far more confident in asking their cows to produce milk from grazed grass with one farmer saying *“Autumn management has been the biggest improvement for me – I’m achieving a whole extra rotation around the farm”*.
- Over the course of the project, the members have had the opportunity to visit a number of farms to see first hand how infrastructure and technology improvements have supported better grazing management and therefore milk production. All participating members have invested in some sort of grazing technologies and infrastructure, including electric fencing and troughs, cow tracks, platimeters and corresponding software programmes.

9.2 Recommendations

For SOMP

- The key findings suggest that those businesses who currently have low milk from forage figures have the most to gain from being involved with a similar project to this. Those who are already achieving the 50% milk from forage industry target or above will benefit from looking more widely at their business – such as financial and physical benchmarking for their production system – to find their next big areas of traction.
- Following on from this project and the learning which has been gained, a financial bench marking exercise would be beneficial to be able to make a comparison between similar business models in order to assess overall competitiveness, efficiency and productivity.
- It would be of considerable benefit to the group to continue with the discussion group model. On farm visits have proven to be extremely valuable to members learning and understanding no matter what level of experience they hold.
- Continue to invest in on farm improvements in grazing infrastructure where required as confidence and experience builds.
- Get regular sward analysis done for the next couple of years between May – July to ensure dietary protein is adequate. This will help manage the herds performance more consistently across the years.

- Set a target to achieve and then maintain at least 50% milk production from forage.
- Set a target to improve of milk from grazed grass annually (as your grazing management and sward productivity improves with it).

General Recommendations

- It would also be of considerable benefit to all livestock farmers who currently do not actively manage pasture to have the opportunity to be involved in a similar project. Grass is the most reliable and persistent crop suitable for livestock in Scotland. Some simple changes in managing grass across even just the 'typical' growing season can give significant benefits.
- All farmers should plan time to get off-farm to see what others are doing – and it doesn't just need to be farms – there's always something to learn from other business types.

10. CONCLUSION

10.1 Project Conclusion

The survey results demonstrate that those farmers who actively engaged with the project have made significant progress in their knowledge and understanding of effective grassland management. Crucially, their confidence in the value of grass to produce milk has increased – this will continue to grow over time as their experience grows.

It is hoped that participating members can be achieving the industry target of 50% milk from forage, with 25% of this from grazed grass. With the tools and knowledge which have been imparted over the last three years from project facilitator (LIC) and through fellow members, the group are well equipped to strive and achieve this goal.

The ultimate validation of this project is that the members have voted to continue on this journey of learning and understanding in using technology and data better to gain higher productivity efficiency. Their plans are listed below.

10.2 Future Plans

Due to their opportunity to participate in the 'Grass to Milk, Organically' Project SOMP members have voted to continue with the discussion group model beyond the life of the project.

Currently there are plans are to have 2 on-farm meetings per year with a potential for a 3rd online grazing meeting mid-season.

They have also agreed to add a physical/financial benchmarking meeting to the programme which will add an opportunity for higher level discussion and learning that will impact even more directly on farm profitability and resilience.

In between the discussion group meetings, there are plans to run 'Learn at Lunch' online meetings where experts are invited to do a brief presentation and answer questions from the online audience.

The SOMP Grazing Project website will remain a central hub for all materials and resources relating to the group going forward and will aide new members as they join.

ANNEXES

Appendix 1 – Budget details – budget allocated to LIC Europe

SOMP Budget		all expenses include VAT							
Year 1	Budget	2017		2017	2018	Total Spend	Dif		
		Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar				
Facilitation Time	7200	2160	2160	1980	1440	7740	-540		
Expert Speakers	2160	0	0	0	0	0	2160		
Soil/Grass Analysis	2400	0	0	0	0	0	2400		
Filming/Prod Costs	2400	0	0	0	2784	2784	-384		
Tech Training	1800	360	0	0	0	360	1440		
Forum Setup & Managment	1200	360		643	886	1889	-689		
Mentoring Support	1200	0	0	0	0	0	1200		
Catering	720	267	165	192	144	768	-48		
Dissemination of Info	600	360	180	180	180	900	-300		
Total	19680	3507	2505	2995	5434	14440.45	5239.55		

Year 2	Dif Yr 1	Budget	2018		2018	2019	Total Spend	Dif
			Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar		
Facilitation Time	-540	6000	1560	1200	880	1200	4840	620
Expert Speakers	2160	2160	0	0	0	0	0	4320
Soil/Grass Analysis	2400	1200	0	0	0	0	0	3600
Filming/Prod Costs	-384	3600	0	350	5168.9	0	5518.9	-2302.9
Tech Training	1440	0	0	0	0	0	0	1440
Forum Setup & Managment	-688.75	600	243.57	443.57	248.37	287.16	1222.67	-1311.42
Mentoring Support	1200	0		475.2			475.2	724.8
Catering	-48	720	108	120		199.33	427.33	244.97
Dissemination of Info	-300	600	720	240	240	240	1440	-1140
Total	5240	14880	2632	2829	6537	1926.49	13924	6195.45

Year 3	Dif Yr 2	Budget	2019		2019	2020	Total Spend	Dif
			Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar		
Facilitation Time	620	6000	1200	1200		2160	4560	2060
Expert Speakers	4320	2160					0	6480
Soil/Grass Analysis	3600	1200	298.65	166.36	41.59		506.6	4293.4
Filming/Prod Costs	-2302.9	3600		1645.77			1645.77	-348.67
Tech Training	1440	0					0	1440
Forum Setup & Managment	-1311.42	600	257.97	17.97	286.75	275.61	838.3	-1549.72
Mentoring Support	724.8	0					0	724.8
Catering	245	720	150	58.46			208.46	757
Dissemination of Info	-1140	600	240	600		960	1800	-2340
Total	6195	14880	2146.62	3688.56	328.34	3395.61	9559	11516.32

Project ran over into April due to Covid19 govt guidance

Appendix 2 – Progression Table

		Farmer name	Rob Drummond	Murray Brown	Callum Wylie	Ian Robinson	William Willis	David Hamilton	Stewart Burt	Andrew Robinson	John/Graham Jamieson	Allan Clark
Pre SOMP Grazing Group	2016	Yield/cow	5089	4994	7886		7994		5122			
		Conc/cow	580	962	1841		1828		1659			
		Avg % solids	7.26	7.49	7.48		7.18		7.29			
		Milk from Forage	3800	2856	3795	0	3932	0	1435	0	0	0
		M f F (standardised L)	3941	2931	3888	0	3867	0	1433	0	0	0
		% of M f F	75	57	48	#DIV/0!	49	#DIV/0!	28	#DIV/0!	#DIV/0!	#DIV/0!
		Purchased feed costs/cow	£222	£253	£636		£631		£649			
Yr 1	2017	Yield/cow	5112	5353	7522		7737	7451	5059		8832	
		Conc/cow	620	1043	1683		1543	?	1719		2638	
		Avg % solids	7.33	7.34	7.4		7.21	7.12	7.09		6.85	
		Milk from Forage	3734	3035	3782	0	4308	#VALUE!	1239	0	2970	0
		M f F (standardised L)	3910	3052	3834	0	4255	#VALUE!	1203	0	2787	0
		% of M f F	73	57	50	#DIV/0!	56	#VALUE!	24	#DIV/0!	34	#DIV/0!
		Purchased feed costs/cow	£ 280	£ 438	£ 565		£ 573		£951		£2,879	
Yr 2	2018	Yield/cow	4872	5241	7349	8770	8053	6927	5416		8946	
		Conc/cow	720	1099	1885	2570	1521	2093	1804		2446	
		Avg % solids	7.45	7.41	7.37	6.92	7.22	7.17	7.2		6.91	
		Milk from Forage	3272	2799	3160	3059	4673	2276	1407	0	3510	0
		M f F (standardised L)	3482	2841	3190	2900	4622	2235	1388	0	3323	0
		% of M f F	67	53	43	35	58	33	26	#DIV/0!	39	#DIV/0!
		Purchased feed costs/cow	£ 347	£ 428	£ 642	£ 1208	£ 650		£756		£2,653	
Yr 3	2019	Yield/cow	4617	5891	7462		7348		5869	7588	9380	6500
		Conc/cow	470	1075	1791		1195		1608	1791	2367	1970
		Avg % solids	7.57	7.58	7.55		7.86		7.37	7.16	7.15	7.36
		Milk from Forage	3573	3502	3482	0	4692	0	2296	3608	4120	2122
		M f F (standardised L)	3863	3636	3601	0	5052	0	2318	3539	4035	2140
		% of M f F	77	59	47	#DIV/0!	64	#DIV/0!	39	48	44	33
		Purchased feed costs/cow	£198	£434	£766		£531		£575	£716	£2,494	£812

NB. Feed costs/cow are subject to seasonal/annual variation due to fluctuations in feed input prices/t
 NB. 2018 was a significantly dry year with many farmers needing to buy in a larger proportion of purchased feed to cover the deficit

Key points:

- The national target for Milk from Forage in all production systems is >50%
- Vast majority of farms showed improvements in their Milk from Forage % over the 3-year project
- Vast majority of farms have reduced their use of purchased feed/cow whilst maintaining or increasing milk production (which means the extra milk is coming from better grass management)
- Some farms have used the extra grass they have grown to increase their herd size as opposed to reducing purchased feed/cow (therefore total farm output has increased – again more milk from grass)

Appendix 3 – Example of meeting feedback for host farmer

Exert from Meeting Summary – Feb 2019 – host farmer Ian Robinson

Feedback for Ian & his team

Set up of grazing infrastructure:

Based on 180 cows in milk – out day & night:

- 180 cows x 15 kgs DM grass/day = 2700 kgDM/day (avg 5-6 kg conc/day)
- If pregraze is 2800 – 1600 residual = 1200 available/ha
- 2700 herd demand ÷ 1200 available = **2.3 ha for 24 hrs grazing**
- 2.3 x 28 days (typical organic rotation length to achieve 3 leaves) = develop tracks/troughs/fencing for 64 ha initially (with 64 ha growth rates will need to about 42 to meet cow demand)

Based on 180 cows in milk – out day only:

- 180 cows x 8 kgs DM grass/day = 1440 kgDM/day
- If pregraze is 2800 – 1600 residual = 1200 available/ha
- 1440 herd demand ÷ 1200 available = **1.2 ha for 12 hrs grazing & housed at night**
- 1.2 x 28 days (typical organic rotation length to achieve 3 leaves) = develop tracks/troughs/fencing for 34 ha initially (growth rate needs to be same as above to meet herd demand)

If you run short of grass on 'developed' grazing area then you have can increase the area to include a silage paddock or two for a time – however all paddocks that are accessible by the cows should be considered grazing platform on the shoulders of the season if ground conditions are suitable

I would advise you to design and create your grazing infrastructure with paddocks about 3.5 ha (8.5 acres) – that will be suitable for 3 grazings (so 3 days if in at night or 1.5 days if out day & night) There would also be enough flexibility in this size to work if you split the herd and put PD+ cows out day/night and leave highs indoors overnight (however without auto drafting this can be management intensive)

Discussions on grazing infrastructure:

- Plenty of access points – keep flexible
- Repeat current cow track – it is ideal!!
- Extending the current track down to the far land is not that far for the herd to walk – the track will be a cow highway! Great potential here if this is your drier land
- Cost benefits of drainage... what sort of lift in productivity are you expecting from this work and are you getting it?? How will you measure it?
- Main opportunity is focussing on the 6-month typical grazing season to start with

Calf health/young stock rearing:

- Clear protocols so that all staff know the routine
- Test colostrum to ensure best quality is kept for heifer replacements
- Colostrum into calves ideally within 2 hrs
- Based on the testing you've done it doesn't sound like colostrum management is the biggest issue
- REST period for calf housing crucial! Calf free for at least 3-4 weeks - clean/disinfect/leave to dry
- Change straw bales at the same time

- Fertility issues with 15-month-old heifers most likely related to LWT gain (linked to sexual maturity)
- Weigh youngstock regularly to find out where the weakness is (as calves; after weaning; while grazing)
- Based on mature LWT 650kg heifers need to hit 390 kg at bulling (60% mature LWT)

Commendations for Ian & his team:

- Grass reseed looks super – very successful; lovely thick sward
- Willingness to invest in improving land
- Lovely tidy farm (thanks to the East Mains team!)
- Sections of cows track you have done so far are ideal
- Herd BCS looked great
- Modern dairy farming facilities
- Keen team; enthusiastic to learn

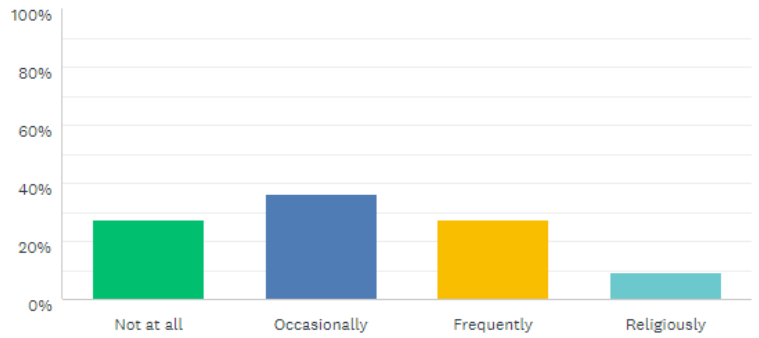
Recommendations for Ian & his team:

- Buy some weigh scales
- Make calving pen comfier – sand was suggested
- Be very sharp on colostrum management
- More cow tracks – avoid trees & hedges so they dry easily
- Focus on grazing dry ground well first
- Get BCS right in late lactation so they at ideal BCS as dry cows
- Identify fertility issues – look into heat detection; conception rate; any trends in infertile cows (young cows; breed type?)
- Feed calf pellets
- Protocol with calf rearing set and clear to all
- Double check milk from forage figures

Appendix 4 – Project Key Findings

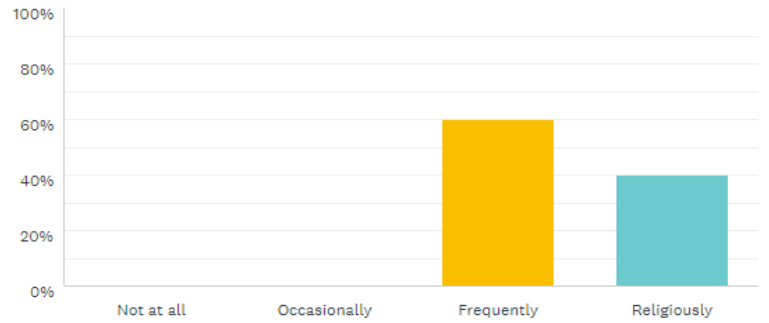
1. How actively did you monitor and manage grazing before the SOMP Grazing Project?

- a. Not at all
- b. Occasionally
- c. Frequently
- d. Religiously



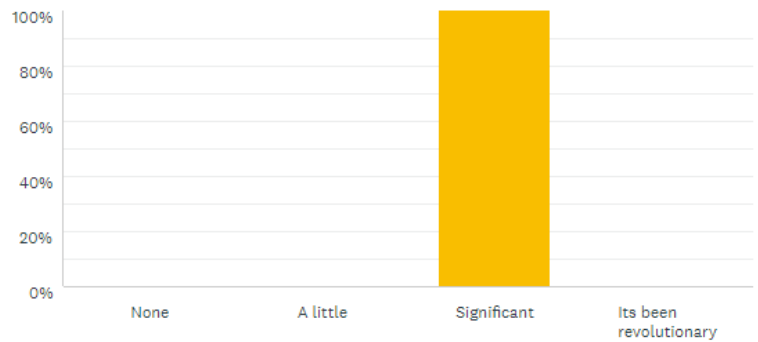
2. How actively do you now monitor & manage grazing?

- a. Not at all
- b. Occasionally
- c. Frequently
- d. Religiously



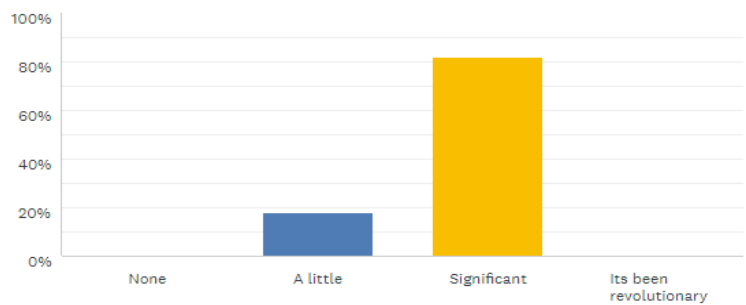
3. How much new knowledge and skill have you gained by participating in the SOMP Grazing Project?

- a. None
- b. A little
- c. Significant
- d. Its been revolutionary



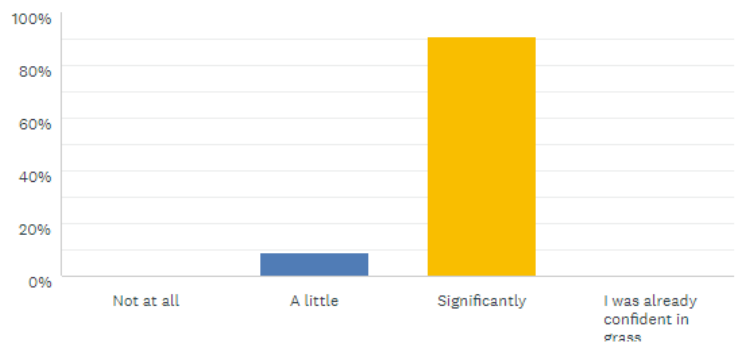
4. How much benefit has your new knowledge/skill been to your overall farm business?

- a. None
- b. A little
- c. Significant
- d. Its been revolutionary



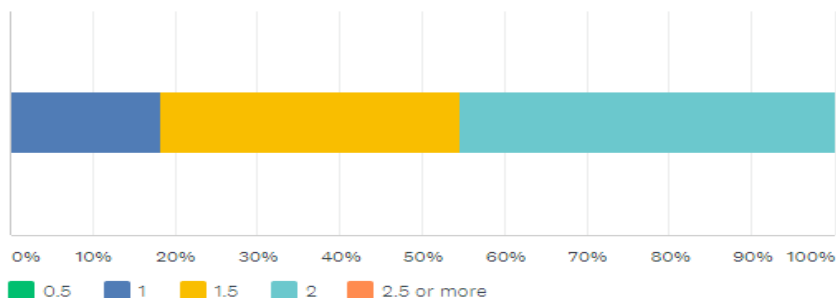
5. How much more confident are you in asking your cows to produce milk from grazed grass?

- a. None
- b. A little
- c. Significantly
- d. I was always confident in grass



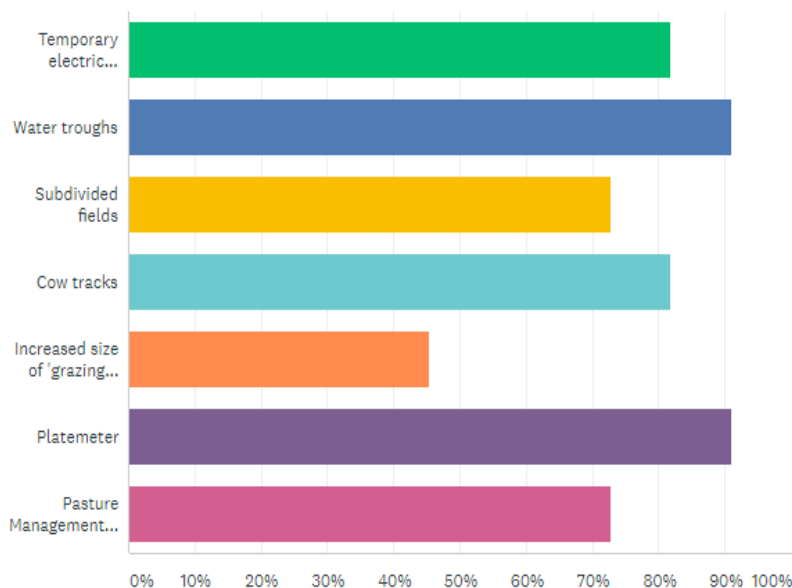
6. How many more months of grazing are you achieving by better understanding seasonal pasture management?

- 0.5
- 1
- 1.5
- 2
- 2.5 or more



7. What grazing infrastructure/ technologies have you invested in since the start of the SOMP Grazing Project?

- Temporary electric fencing
- Water troughs
- Subdivided fields
- Cow tracks
- Increased grazing platform or now grazing silage fields
- Platometer
- Pasture management software



Comments from participants:

“It’s highlighted how much I can improve – an opportunity to learn from other farmers doing better than me”

“I’ve made huge improvements in my knowledge of grazing – I was very much a newbie”

“I always learn something new from every farmer, regardless of their system”

“Autumn management has been the biggest improvement for me – I’m achieving a whole extra rotation around the farm”

“Personally, a steep learning curve (non-farming background) so the on-farm meetings have been hugely beneficial”

“We’ve had a change in mind-set; moving away from high input and we’re no longer ‘actively avoiding grazing!’”

“I’m new to organic so the opportunity to visit established organic farms regularly has been hugely beneficial”

“Greatest improvement has been in my spring grazing management; now achieving significantly earlier turnout which the farm team love”

“Farming can be a somewhat isolated job – I’ve really enjoyed the social aspect of the on-farm meetings and getting to chat a little bit about everything”

“Improved confidence in grass and grazing and how my cows can perform”

“The online meeting was surprisingly useful and can be better utilised going forwards given we are so geographically separate”

Appendix 5 – Active Project members list

Involvement in SOMP Grazing group	Member Name	Trading Name (Bank Rcd)	Address 1	Address 2	Address 4	Postcode
Active	Allan Clark	Allan Clark	Auchlea	Kingswells	Aberdeenshire	AB15 8ST
Active	Andrew Robinson	A & A Robinson Organic Milk	Kirwaugh Farm	Wigtown	Wigtownshire	DG8 9AY
Active	David/ Tom Hamilton	J & E Hamilton	Old Farmhouse	Nether Pirn	Peebleshire	EH44 6PA
Active	Gavin/ Jonny Lochhead	Thomas Lochhead & Sons	Beyond the Burn	Mouswald	Dumfries & Gal	DG1 4LX
Active	Ian Robinson	Torhousemuir Ltd	Torhousemuir Farm	Wigtown	Wigtownshire	DG8 9DJ
Active	John/Graham Jamieson	Firth Farming Ltd	Upper Locharwoods	Ruthwell	Dumfries & Gal	DG1 4NJ
Active	Keith Martin/ Stuart Burt	K R Martin Farm	Draffanmuir	Netherburn	Lanarkshire	ML9 3DQ
Active	Martyn/ Sandy Berguis	Firm of M & S Berguis	Over Langshaw	Galashiels	Scottish Borders	TD1 2PE
Active	Murray/ Jane Brown		Muirhouse Farm	Libberton	Lanarkshire	ML11 8LY
Active	Ross Paton Callum Wylie	H M Paton & Co	Torr Farm	Auchencairn	Kirkcudbright	DG7 1QN
Active	William/Anne Willis	A & A Willis (A Firm)	Mains of Glasgoforest	Kinellar	Aberdeenshire	AB21 0SH
Active	Robert /Sarah Jane Drummond	RW & SJ Drummond	Oslebrae	Old Glasgow Rd	Ayrshire	KA3 5JP

Appendix 6 – see Case Study 1

Appendix 7 – see Case Study 2