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Site: Llwyn Goronwy - Farming Connect Focus Site

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Project title: Evaluating the benefits of milk recording in a spring block calving herd

Background:

Milk recording is rarely carried out by spring calving herds. However, milk recording can bring many benefits to milk producers for example, herd health status can be determined, specific cow yields and composition of the milk, which can allow farmers to tailor their product for their milk processor.

Llwyn Goronwy is a grass based dairy system, milking 320 cross bred spring calving cows on a 40 point rotary parlour. The farm is located on the outskirts of Llanrwst and is farmed by brothers, Elgan and Gareth Evans and their father Brynmor. The farm supplies milk to Arla and aims to maximise milk yield of fat and protein per cow.

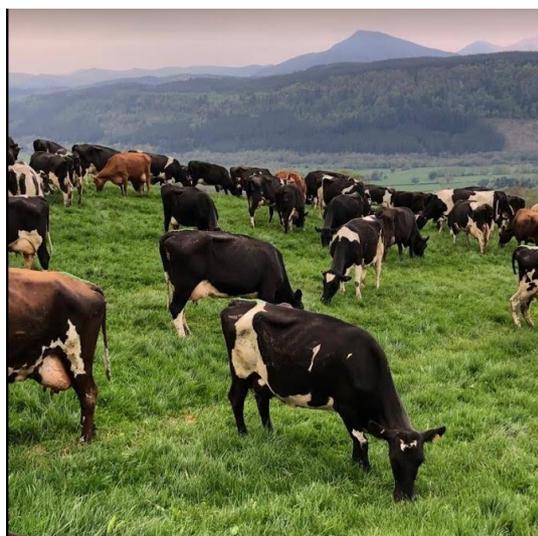


Figure 1. Cows grazing at Llwyn Goronwy

The business converted to spring milk production in 2012 using Jersey and New Zealand Friesian genetics on the 150 cows owned at the time. Since converting to spring calving, Llwyn Goronwy has not milk recorded on the farm, however, their milk processor currently routinely tests the milk four times per month for payment purposes.

Presently, the business is selling surplus heifers. They are not sure whether they are keeping the best or selling the best, either way this may prove to be costly.

In order to make better informed decisions on how best to manage their herd, the business would like to milk record their cows. As previously mentioned, milk recording is more common on all year round (AYR) calving herds where volume is king, rather than spring calving herds where compositional quality is king.

Currently, monthly recording information is interpreted based on AYR parameters and measures and is not specific to block calving herds. If more spring calving herds are to take up the option of milk recording then fertility and production information should be presented in a relevant format which is essential if herds are to become more efficient.

UK milk production is changing its focus to compositional quality rather than volume. In 2019/20, 53% of UK milk is sold on a compositional basis (AHDB).

Introduction:

Milk recording was identified as a tool that would benefit Llwyn Goronwy's business.

The aim of the project is to make better use of data by recording all the cows individually and to investigate how milk recording data can be better presented to spring calving milking herds.

We anticipate the project will improve the performance and profitability of the herd.

The following project objectives were identified at the outset of the project:

- Establish optimum cow size and weight for Llwyn Goronwy topography and infrastructure.
- Analysing and improving yields per cow.
- Increasing weight of fat and protein produced.
- Culling persistent high cell count cows to ensure the bulk milk remains in the premium pricing bands.
- Identify herd health status e.g. Johne's disease.
- Selecting high performing cows for breeding replacements based on performance and selecting poorer performing cows with beef sires.
- Recording live weight to monitor performance compared to live weight (i.e. are heavier or lighter cows more efficient). This will be measured as kg of milk solids (MS) per kg of live weight (kgMS/kgLW).

Method:

The first step of the project was to enroll the business onto the National Milk Recording (NMR) Scheme. The 'Grazing 4' option was chosen which is specifically designed for seasonal milking systems. This option involved milk recording on a quarterly basis and included the hire of 40 milk meters to measure the volume of milk producers per cow.

An NMR milk recorder attended consecutive evening and morning milkings to record and sample the milk of each individual cow.

Cows were weighed at 120 days into their lactation to ascertain whether heavier cows are as efficient as lighter cows, comparing kg/solids to kg/weight of the herd.

The cow weight/kg/MS data identified the most and least efficient cows through the weight of kg/MS ratio. This gives Llwyn Goronwy the opportunity to determine future breeding policies by ensuring the use of the right type of bull for the herd and ensure they reach their goal of 500kg/LW to 500kg/MS

It had been the intention to have done three recordings prior to the herd being dried off in December 2019. However, due to technical issues at NMR, only two recordings took place; these were carried out in October and December respectively and analysed butterfat, protein and somatic cell count (SCC). Although three recordings were preferred to enhance accuracy, two recordings are still sufficient to prove their milk recording value.

When the project was initiated, there was no provision by any of the recording services to provide individual cow weight data and consequently no auto calculator to calculate the weight of milk solids to cow weight. As a result, cow weight and combined weight of milk solids data had to be manually entered into an Excel spreadsheet and calculated manually.

Selecting the ideal cow for Llwyn Goronwy

As previously mentioned, the business requires a cow suitable for a spring calving herd and that fits their infrastructure i.e. walking distance on the grass based system, possesses a tight udder and fits the cubicles. This will offer maximum efficiency and therefore profitability for the business. Other measurable cow attributes desired by Llwyn Goronwy include:

- More than 220 days in milk
- Less than 305 days in milk
- Low average SCC
- 1kgMS > 1kg body weight
- Strong Mobility
- High Fertility

Data analysis

Two options were identified to measure cow performance:

- Option 1 – ranking the cows on kgMS
- Option 2 – ranking cows on kgMS to liveweight

Results:

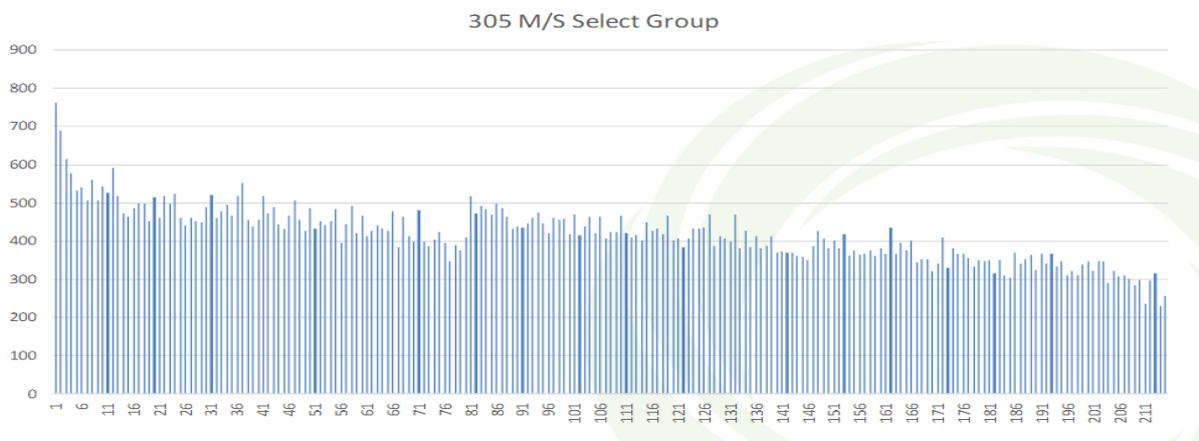
Option 1

Top 5 cows on milk solid production					
Rank	Cow #	Milk Solids	Lactation #	SCC over limit	Average SCC
1	233	762	4	1	96
2	258	689	4	0	42
3	342	653	2	0	77
4	246	615	4	1	291
5	20	593	5	0	132

Table 1. Top 5 cows ranked on 305 day milk solids production only

The table above takes into account milk solid production according to lactation which is influenced by cow weight and size. This table ranks the highest overall solids producing cows, but takes into no account of cow size, weight, dry matter intake and therefore overall efficiency. Ranking cows just on solid production would not drive improvement in efficiency. We do know the amount of concentrate fed but not the kilograms of grass that has been consumed to generate this production; we can only assume this as a % of the overall body weight.

Graph 1. Distribution of kg milk solid production



Average Milk Solids 419

Top 25% 509

Bottom 25% 330

Difference 179

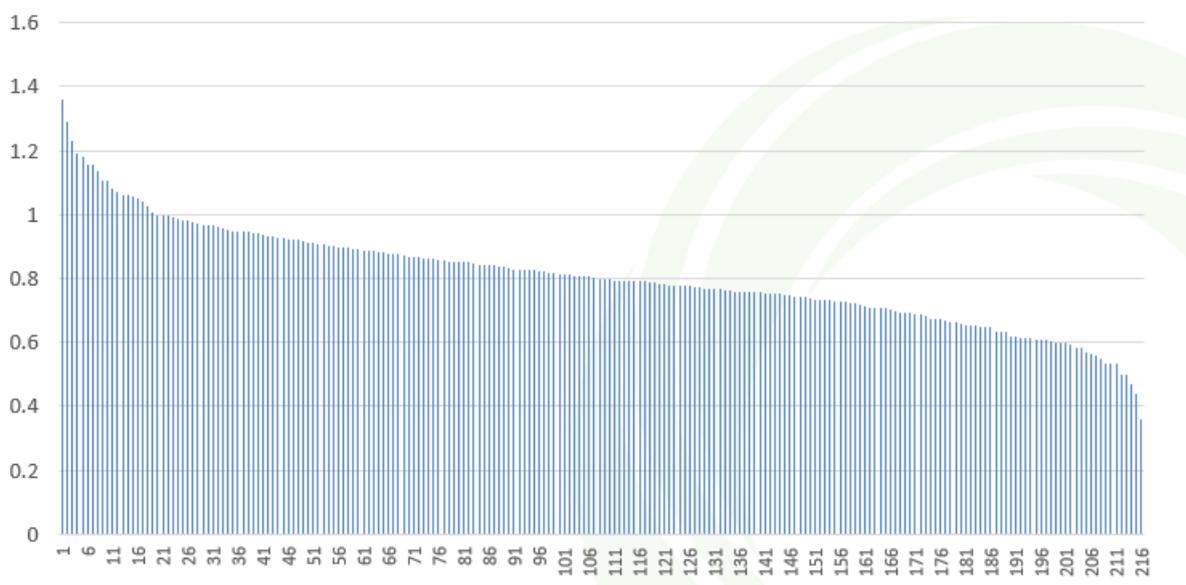
Option 2 - Adding in cow weights

Top 5 cows on milk solid production vs weight								
Old rank	New rank	Cow #	Milk solids	Weight	Lactation #	SCC over limit	Average SCC	MS to weight
14	1	226	520	382	1	1	1046	1.36
15	2	853	519	403	2	1	195	1.29
2	3	258	689	560	4	0	42	1.23
7	4	513	559	469	2	2	2290	1.19
67	5	145	454	384	1	0	21	1.18

Table 2. Top 5 cows ranked on kg milk solids/kg liveweight

This top 5 cows chart is based on milk solids/weight ratio, this gives an indication of efficiency of conversion of grazed grass into milk solids.

By using milk recording Llwyn Goronwy has been able to look at the cell counts and in our top 5 graph, two of the most efficient cows have cell count problems with cell counts in excess of a million.



Graph 2. Distribution of cows on kgMS/kgLW

Average	0.81
Top 25%	1.01
Bottom 25%	0.62
Difference	0.39

Weight summary

Total Herd			
Average 525Kg	Top 700Kg	Bottom 382Kg	Difference 318Kg
Top 25%			
Average 488Kg	Top 660Kg	Bottom 382kg	Difference 278Kg
Bottom 25%			
Average 569Kg	Top 700Kg	Bottom 455kg	Difference 245Kg

Table 3. Showing weight of top and bottom 25% of cows ranked on kgMS/kgLW.

Financial implications of efficient cows

The example below compares two cows at Llwyn Goronwy with different weights and intakes, which demonstrates the effect on efficiency and profitability. Cow 1 is more efficient and has more kgMS/kgLW than Cow 2 driven by higher % of fat and protein.

Cow 1

500 kgLW eating 4,575kg of DM (1,000kgDM concentrates and 3,575kgDM grass) in 305 days

Cost of concentrates =£230

Cost of grazed grass (@£90/tDM) = £214.50

Yield 5,500 litres with 5% Butterfat and 3.7% Protein

Total milk solids = 479kgMS

Cow 2

535kgLW eating 4,895.25kg of DM (1,000kgDM concentrates and 3,895.25kgDM grass) in 305 days

Cost of concentrates = £230

Cost of grazed grass (@£90/tDM) = £233.70

Yield 6,000 litres @ 4.3% Butterfat and 3.4%Protein

Total milk solids = 462kgMS

Difference in total between Cow 1 and Cow 2 = 17kgMS

Assuming Arla average for butterfat and protein of £3.65 per kg, gives a value difference between the two cows of £62.05

Currently at Llwyn Goronwy the most efficient cows tend to be lighter cows. This is driven by Jersey influence; however, some larger cows are also efficient and these black and white cows can compare well with their Channel Islands counterparts. Larger cows also have other advantages including higher cull cow value and stronger bull calf values.

At Llwyn Goronwy the overall aim is to increase total milk solids per hectare (ha) through maintaining the existing number of cows and stocking rate. Therefore, Elgan prefers to drive milk production/ha with a 550kg black and white cow producing 550kg of milk solids (MS) and not by increasing the number of cows. At the same time, he is mindful that he does not want to have high yielding cows with lower milk solids. Through milk recording and weighing cows, he will continue to build on what has already been achieved.



Figure 2. Cow grazing at Llwyn Goronwy

Conclusion:

Overall, the project:

- Enabled the comparison for cows on a more even basis
- Highlighted the cows that are underperforming
- Enabled a targeted mating plan
- Provided a target for ideal liveweight for individual farm/system
- Enabled informed selection of discretionary culls
- Enabled faster herd improvement
- Highlighted the importance of engaging with the AI technician to devise a system to help identify the top 25% performers in the herd on an ongoing basis to ensure they are artificially inseminated to maintain herd performance.

Milk recording providers have, in the past, been geared to providing data for all AYR (all year round) high yielding herds. This is beginning to change as there is an increasing number of spring and autumn block calving herds now milk recording.

However, NMR, the recording provider used on this project, are now in the process of providing this application via their data capture tool, Herd Companion. The farm is able to take advantage of the tool's ability to interpret data in the form of weight of milk solids to cow weight. This is a new feature that is an advantage to block calving herds on a manufacturing contract such as at Llwyn Goronwy.

Additional benefits of using the recording service include the identification and level of Johne's and individual cell counts in the herd.

In conclusion, we must include an acceptable level of production and weight that fits the overall farm infrastructure so that the right cow fits the cubicles, buildings, soil type, farm layout and herd management experience.



Figure 3. Cows grazing at Llwyn Goronwy