Nantglas

Iwan Francis

PROJECT: Increasing milk from forage

LOCATION:
Talog

FARM:

Sector: Dairy

Stock numbers & breed: 200 Friesian cross, 120 followers

Farm size (ha): 55ha and 75ha off-lying rent

Crops & ha grown: 40ha silage

Calving pattern/Lambing months: Two split block calving

Grazing system: Rotational grazing

Diversification & innovation: Heat detection collars

FARM OBJECTIVES

1. Reduce calving period from 12 weeks to 9 weeks
2. To maintain a low cow empty-rate, currently under 10%
3. To grow in excess of 12 tonnes of dry matter/ha (tDM/ha)

Key take home messages:

- Comparing 1,000 tonnes fresh weight of silage at 30% dry matter (DM) with a D value of 75% compared to 65% D value can produce 90,566 litres more milk.
- Up to 6% D value can be lost between mowing and forage harvesting. Reducing this loss to 3% by rapidly wilting to 30%DM is a realistic target.
- Target 700kg FM/m3 clamp density - Nantglas achieved 900kg FM/m3 clamp density.

The problem:

Silage is the main winter feed for most dairy farms in Wales and the quality of this can have a major impact on milk production, herd health and fertility. It also has a major impact on the environment, particularly the carbon footprint of a farm.

For some, the most important days of the year are first and second cut silage-making time. If that goes wrong, it can lead to a challenging year.

At Nantglas, the target was to improve silage quality through small changes in management. The main factors affecting silage quality are well known. However, not enough thought is paid to the detail often enough.

Purpose of work:

1. Crop quality at harvest and wilting time
The two main drivers for this should be digestibility (D value), metabolisable energy (ME) (% D value * 0.16 = ME) and crude protein content. As soon as the grass is cut, it begins to lose quality, energy and protein until the moment it is consumed by your livestock. Everything you do can affect the extent of these losses.

2. Sheeting and compaction
Removing oxygen rapidly during clamp filling and keeping it out of the silage clamp during storage will retain more energy and true protein, will reduce dry matter losses, both visible and invisible (CO_2 and water), will improve intake and result in more milk produced.

What we did:

It was important to get back to basics with silage management, therefore three key areas were focused on:

- Improving crop quality at harvest - Harvesting when there is no seed stem visible in the field will give a D value of around 75%, compared to 60-65% when seeds are formed.
- Reducing time before first wilting - Wilting rapidly by spreading the crop immediately and ensiling within 24 hours will reduce sugar respiration in the field.
- Increasing clamp density and quality by introducing side sheets, cling film top sheet and gravel bags along side-walls. Also, using a silocompactor to increase clamp density.

Outcomes:

Silage quality at Nantglas over the period of the project, 2020 to 2022 has not always improved. This has been in part due two relatively dry and cold springs, which have both had an effect on grass growth and nutrient uptake from soils, in particular nitrogen, which then affects silage crude protein content.

On occasions, some silage fields were grazed and others were not grazed prior to ensiling, which challenged the timing of cutting for first cut silage. There will always be a compromise between quantity and quality if all fields are harvested at the same time. Dave Davies from Silage Solutions suggested that ungrazed fields were made into dry cow silage bales at the same time as the remaining first cut is harvested for the clamp. By doing this, the timing of all fields for the second cut would be the same, which will result in both good dry cow silage and high-quality clamp of first and second cut silage.

Silage density has been improved by the use of the silopactor which reduced under-rolling of the side of the clamp and reduce the risk of over-rolling the centre of the clamp, which then results in secondary fermentation and poor fermentation quality, which results in less silage DM losses. This has a positive effect on fertility.

The use of the Ecosyl silage additive compared to the previous product should also have improved silage fermentation quality, reduced DM losses and improved nutritive value and intake. However, standard silage analysis does not have the accuracy to pick these differences out.

Photo 1. Silocompactor being used on the clamp

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Other projects taking place on this site:

Comparison of fresh grass samples and soil samples to determine its effect on Pica cases

Key take home messages:

- Pica is assumed to be linked with phosphorus deficiency, however, in this case, magnesium was the antagonist.
- An imbalance of low magnesium and high calcium can lead to less availability to the stock of minerals and trace elements
- The ideal balance in the soil for calcium to magnesium is 7:1, whereas with these results, the level is closer to 15:1.

The problem:

During spring and early summer in 2020, Nantglas's cows were yet again eating stones and rubble. This is an ongoing issue for Iwan, having previously lost cows to blocked stomachs, therefore it was decided to investigate further. This abnormal behaviour, which may also involve licking or chewing wood fences or other non-nutritive material, is called Pica. While animals showing Pica can look healthy, this behaviour can lead to undesirable consequences, such as ingestion of objects which could damage the gut. This abnormal appetite is generally associated with mineral deficiencies (sodium and phosphorus) and/or lack of structural fibre. Other possible causes are energy or protein imbalances, intestinal parasites or other mineral deficiencies. In some cases, the cause is unknown.

Purpose of work:

The cause of Pica is generally unknown with little research into the subject and the cause can vary significantly between farms. Iwan was quick to take on the opportunity to research and understand the underlying issue at Nantglas to reduce the risk of losing cows to ingestion and health issues down the line due to gut damage. As soil nutrition is not always made available in the grass, soil samples alone aren't sufficient enough to understand what valuable nutrients are available to the cow. It is important to compare the nutrients in both soil and grass sample to have a clear understanding of what the cows are receiving and if the nutrients are adequate for the cows' requirements.

What we did:

Nigel Howells, a grass and soil specialist, advised Iwan to take detailed soil samples and fresh grass samples from two fields to compare; one field at Nantglas (a) and one at neighbouring rented land (b). Mineral and trace element analysis were carried out on fresh grass samples to determine what nutrients were readily available to the cows when grazing. With these results, soil samples were taken from the same fields and analysed to determine a correlation between the available nutrients and minerals in the fresh grass samples and the residual availability in the soil.

Outcomes:

The nutritional grass quality in both samples for protein/D value and energy were good:

- 80%+ D value
- ME at 12.5MJ/kg or more
- Protein ranged between 15-16.5%
- Sugars were high at 26-28%

Historically, Pica is assumed to be linked with phosphorus deficiency, however, in this case, magnesium was the antagonist. In both samples taken, magnesium levels were very low, along with low levels of most major trace elements; copper/zinc/selenium/cobalt. This result in low magnesium corresponds with other mineral grass analysis of farms suffering with Pica.

It could be seen that magnesium and phosphorus levels were adequate at indices of 2, but for the soil to work at it most productive, ideally both levels would be slightly higher at 3. Residual calcium levels were adequate in field a and low in field b. Sample b showed low residual calcium level in the soil but had a high available calcium level in the fresh grass sample. Whether this is a true result can only be backed up by taking another sample.

The levels of calcium and magnesium in the soils should be looked at in order to improve the soil activity in optimising available minerals. As an imbalance of low magnesium and high calcium, this can lead to less availability to the stock of minerals and trace elements. The ideal balance in the soil for calcium to magnesium is 7:1, whereas with these results, the level is closer to 15:1. A possible short-term consideration is to discuss trace element supplements with the farm vet to balance out any current deficiencies in the soil/grass until the correct balance of minerals is available from grass.