

Big benefits from slurry treatment

Closer links between environmental management and future farm support payments mean animal manure management remains a priority for livestock farmers. Slurry storage and management has recently become less of a headache for Michael Cornish, who runs a herd of 95 Holsteins with his wife Lisa and his father Royston near Bradworthy.



Michael Cornish

The all year round calving herd averages 8200 litres and typically grazes from early April to mid-October as conditions allow on the heavy land. The farm also carries around 80 followers and a few beef cattle. In the winter, the cows are housed in cubicles, bedded with sawdust on mats and fed a diet based on grass silage.

Slurry storage is an 180,000 gallon above ground store, meaning slurry has to be spread regularly on the farm which falls outside NVZ regulations. In the summer Michael uses his own 2000 gallon tanker to spread on silage ground, some of which is three miles away.

In the winter, when he can't travel, his contractor uses an umbilical system with a splash plate, applying slurry to the 50 acre grazing block.

"Time was a real problem," Michael comments. *"After milking, feeding and scraping there is only a limited window to get out and spread slurry. As the slurry would have separated out, I had to agitate the tank for three hours on the first day and then for an hour on every day we planned to spread. This reduced the loads I could shift per day."*

With the interval between silage cuts getting shorter, he needs to get slurry on quickly after each cut to reduce the risk of contamination of the subsequent cut. Slurry needs to be fully incorporated into the soil prior to grass being cut as any residues will compromise the fermentation of grass in the clamp.

Following a discussion with Glen Johns from Harpers Feeds in the summer of 2016, Michael agreed to see if Biotal SlurriNprove would make a difference.

"SlurriNprove is a biological treatment containing a specific blend of enzymes and bacteria which can improve the handling characteristics and nutritive value of slurry," explains Biotal's Steve Symons.

"The enzymes and bacteria help break down some of the fibre fraction of the slurry, reducing sedimentation of solids and lowering the production of ammonia meaning more nutrients are retained in the slurry."

More loads per day

SlurriNprove is quickly and easily added to the slurry. Michael just mixes a sachet in a bucket of clean water every month before pouring into the reception pit. It is then pumped into and mixed in the main tank.

"Using SlurriNprove I can spread around 20 more loads a week as I just have to agitate for an hour on the first day of spreading and then don't need to re-agitate for two weeks. This has made a huge difference to timeliness of spreading."



Steve Symons

Reduced sedimentation means the slurry pumps and spreads more evenly which is a benefit to both Michael and the contractor. Importantly, it more rapidly disappears in the field.

"We have seen big improvements in growth on both grazing and cutting fields as the slurry is used more rapidly and it has a better nutrient content too."

More nutrients

"The analysis is improved compared to untreated slurry so we can make savings on bagged fertiliser. While still applying 90 units of nitrogen on first cut, last year I used three bags of 27:5:5 with sulphur rather than four bags of 21:8:11, reducing the number of bags spread on first cut by 25%, saving time and costs."

"Treating slurry has simplified slurry handling and management, saving time and improving the effectiveness of utilisation," Michael summarises.



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Precut analysis for greater precision

In just a few week's time, dairy farmers across the country will be making a decision that will have a huge bearing on their profitability this year – when to take first cut.



Biotal's Lientjie Du Plooy says taking a more scientific approach to timing of cutting grass could have a big impact on forage quality and milk from forage.

You can't tell if grass is at the optimum growth stage for cutting just by looking at it, although if it is showing signs of ear emergence you can be certain quality is already declining. To time cutting better and increase the prospects of making high quality forage, you need data on how the crop is maturing. Pre-cut testing, previously seen as just a way to assess fermentation characteristics, is the simple and effective way to do this.

Weekly sampling of fields from at least two weeks prior to the anticipated cutting date gives a wealth of information on both how the crop may ferment but also the potential feed value.

What are you looking for?

38-40% NDF in DM - NDF is the guide to how well a plant is maturing and increases rapidly as the plant matures. NDF levels above 40% indicate grass is maturing and feed value will decline.

20% DM - Fresh grass at 20% DM will lose moisture at approximately 1% per hour in sunny, breezy conditions, meaning grass can be at the optimum 30% for ensiling after a 10-12 hour wilt.

Minimum 3% sugars in freshweight (10% in DM) - As grass ferments so sugars are used up. The higher the initial sugars, the more effective the fermentation will be, supported by a Biotal crop and condition specific inoculant, and the higher the residual sugars in the finished silage, ensuring a higher energy feed.

Free nitrates less than 1000mg/kg freshweight - (0.1% Freshweight) free nitrates, where nitrogen has not been converted into protein, have a high buffering capacity, slowing the rapid fall in pH needed for a stable fermentation.

Achieve these targets and you will increase the prospects of well-fermented higher quality forage.



Lientjie du Plooy



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Focus on NDF digestibility the key to improving forage utilisation

Producing grass silage with more digestible fibre can increase intakes and performance, helping dairy farmers take control with forage.

According to Roy Eastlake, Biotal National Technical Support Manager, focussing on the digestibility of fibre in grass silages is potentially the next big breakthrough in making better quality forage and will have a big impact on how well cows utilise their diet.



“While farmers and nutritionists talk about overall Neutral Detergent Fibre (NDF) levels in forages and formulate to a target NDF content in the diet, fewer talk about how digestible the fibre is. However, research has shown that this has a significant bearing on rumen health and performance.”

The NDF proportion in any feed is made up of different fractions including cellulose, hemicellulose and lignin. Their role is to give the plant structure and the balance of different components changes with increasing plant maturity.

“As a plant matures, for example when grass starts to head, two things happen. Firstly, the total NDF content increases and secondly, the proportion of lignin which is indigestible increases

leading to a fall in overall NDF digestibility, both of which can lead to reduced performance. Too much indigestible fibre has a ‘bulk’ effect, slowing rumen flow and can reduce dry matter intake.”

Research carried out at Michigan State University shows a positive correlation between NDF digestibility and cow performance due to the greater digestibility of the forage improving intakes and providing more energy for milk production. (see diagram 1). This is why we need to focus on NDF digestibility, not just total NDF levels.

Data available

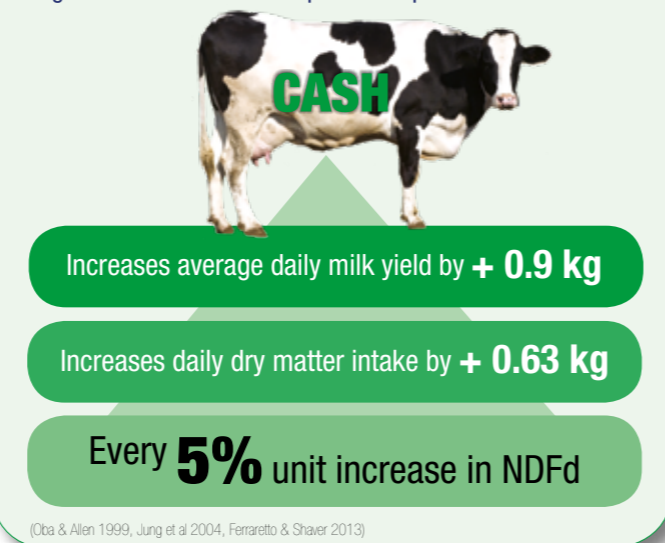
NDF digestibility is now shown on many silage analyses so the data is available, but it is important to manage crops to achieve these higher levels.

“Farmers on rotational grazing systems may not know it, but they are actually selecting crops with superior NDF digestibility as they are taking young fresh grass which is not going to head. But when it comes to conserving grass silage, the reverse is true in many cases.

“By leaving crops to bulk up and waiting until first signs of ear emergence, what is actually happening is that we are accepting poorer quality. This is why we are encouraging farmers to move to the Biotal Opticut system of more frequent cutting, taking crops younger and ideally at 28 day cutting intervals, which will ensure better quality forages as a result.

“For example, the average NDF of first cuts being fed this winter was 45.9% at 68.5% digestibility. A Biotal customer who has committed to more frequent cutting and takes a minimum of five cuts,

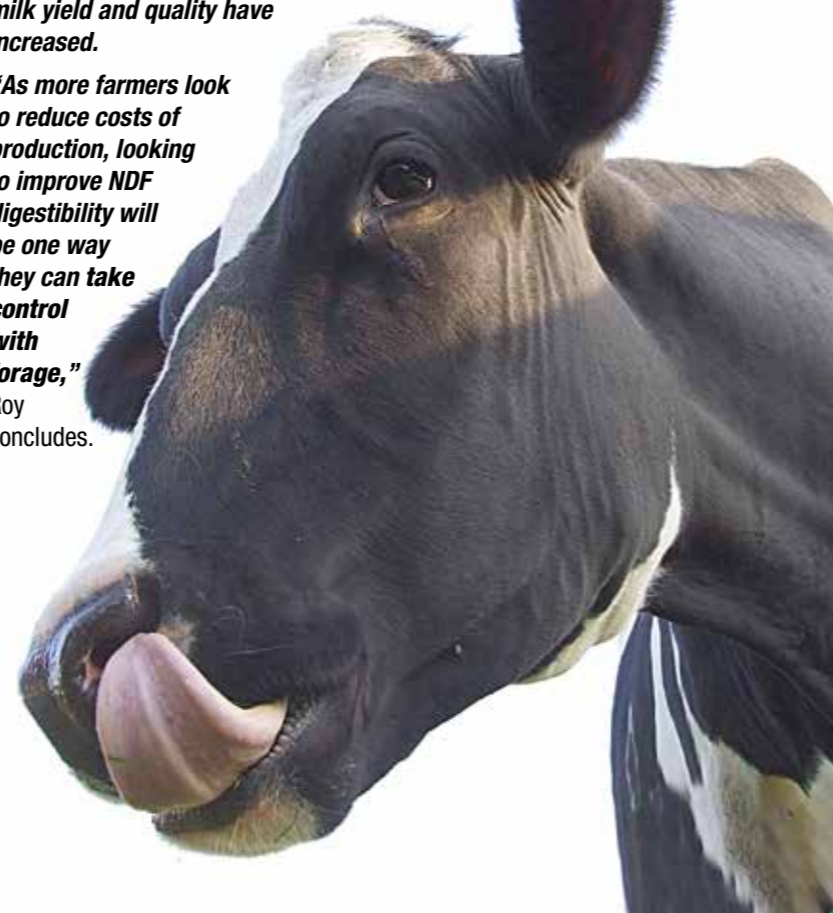
Diagram 1- How do cows respond to improvements in NDFd?



had a first cut with 41% NDF and 83.2% digestibility while second cut was 40% NDF at 81.7% digestibility.

“This has helped him average 14kg forage dry matter intake per cow per day over the winter, which is 55% of total dry matter intakes, and both milk yield and quality have increased.

“As more farmers look to reduce costs of production, looking to improve NDF digestibility will be one way they can take control with forage,” Roy concludes.



Myth busting

With decisions soon to be made about which silage inoculant to use to ensure well-fermented and stable high quality grass silage John Bright, Biotal Head of Technical Marketing Services, believes it is time to dispel some common myths about inoculants.

Choosing a silage inoculant is a crucial decision so it pays to make sure you have the best information available. To help, I have looked at three common myths often spread about inoculants.



Myth 1 - Don't use *L. buchneri* as it causes huge dry matter losses.

It is true that when used in isolation *L. buchneri* can cause around 1% higher dry matter losses during the initial anaerobic fermentation, but it is important to look at the total picture.

Firstly, all our grass inoculants contain *L. buchneri* plus a complementary homolactic strain which minimises any losses. Secondly, for drier forages, most dry matter losses are aerobic which occur during feed out and storage and it is here that *L. buchneri* is in a class of its own, reducing aerobic losses significantly.

Using a combination product based on *L. buchneri* will actually reduce total losses, giving more silage to feed.

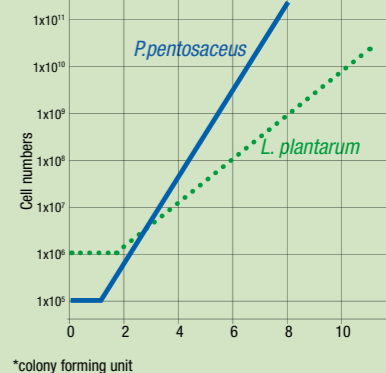


Myth 2 - You need an initial population of one million CFU* for an efficient fermentation.

Not true. You can't commoditise bacteria in this way as they all act differently in the silage environment. The objective with bacteria in silage inoculants is for them to grow quickly and outcompete the naturally present bad bacteria on grass which cause nutrient losses.

The initial population is less important than the rate at which they grow. All our strains are selected for speed of growth. The graph compares our strain *P. pentosaceus* which is used in axphast, axcool and supersile with a typical *L. plantarum* which is found in several commercial inoculants. While *L. plantarum* doubles its population every hour, our strain doubles every half hour. Despite an initial population of 100,000 compared to 1 million for *L. plantarum*, within four hours the faster growing strain has a larger population meaning it will be delivering a more effective fermentation.

So while it is a numbers game, look at the rate of growth, not the original population needed.



Myth 3 - All strains of an *L. buchneri* are the same so it makes no difference which strain I choose.

If it were only that simple! In the same way that people vary and breeds of cows vary, so strains of bacteria have different properties meaning some are more effective and efficient than others.

Just as you will breed from you best cows, we have to identify the best bacteria. Finding the most effective strains takes considerable time and research, looking at fermentation profiles, nutrient preservation and growth rates. We will evaluate thousands of strains to identify the one which performs best.

When selecting an inoculant, look for strains of bacteria with independent trial data and evidence of their effectiveness.

Our strain, *L. buchneri* 40788 is the original and most extensively documented silage bacteria in the world. Professor Limin Kung from Delaware University, the world renowned expert in silage fermentation, has described *L. buchneri* 40788 as the gold standard bacteria to improve aerobic stability.



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Come and visit us at Grassland UK 2018

We are exhibiting at Grassland UK which is being held at the Bath and West Showground at Shepton Mallet, BA4 6QN on Thursday 10th May

Come and find out more about our Biotal Opticut System to take control with forage, our range of crop and condition specific inoculants and our guide to making the most of wholecrop.

We look forward to seeing you there.



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We are committed to helping farmers get the most from forage through improved production and utilisation of high quality feeds, making the latest information available quickly to improve decision making and milk from forage.

Follow us on Twitter at @biotalUK for all the latest news and developments on taking control with forage.

Follow us before April 30th and be entered into a PRIZE DRAW to win a Biotal body warmer and goody bag