Maximize milk potential of your grass

2015 was a hard year for the dairy industry. End of the milk quota, low milk price – challenges all around. 2016 promises the start of a recovery and the farm needs to start thinking about maximizing productivity, and ensuring that the dry cows are in the best condition possible for when the milk price starts to properly recover. The key to this is of course the quality of the silage.

Silage inoculants give nature a helping hand. Good silage inoculants are "natural" bacteria that have been selected from a high quality clamp, grown-up and packaged so that farmers can apply them to our forage. Sil-All 4X4+ has 4 of these "really good" bacteria that you can use on your forage.

These bacteria convert sugar to acid – they pickle and preserve. Sil-All 4X4+ bacteria maintain the nutrients from the fresh grass because they very efficiently produce lactic acid from the available sugar as opposed to making weak acids, alcohol and gas. The speed of this process is critical to maximize the milk potential of your grass – the faster the fermentation the more nutrients, energy, protein and digestibility are maintained in the silage and the more milk that can be produced based on your silage. That is the milk potential.

Survival of the Fattest

So – Sil-All 4X4+ adds "natural" bacteria to the clamp to convert sugar to acid. So why do we buy Sil-All 4X4+ when the weather has been good and we have high sugar levels?

Silage season follows winter. The harsher the winter the fewer natural bacteria that survive through the winter, and nature does not select the best silage bacteria to live through winter. Nature selects the *hardiest* bacteria – the slow growing bacteria that prefer the cold temperatures to survive. The numbers of silage bacteria that survive through winter are low, so, if we rely on nature to ferment our silage we end up with a slow rate of fermentation (slow rate of pH fall), high nutrient loss, high energy loss and high digestibility loss. By adding Sil-All 4X4+ we dominate the fermentation at each stage, maximizing the maintenance of nutrients, energy and digestibility.

The natural bacteria that are found on fresh grass can be broken down into 3 main categories. Enterobacteria (organisms from the soil and slurry), hetero fermentative Lactic Acid Bacteria (slow fermenting bacteria) and homo fermentative Lactic Acid Bacteria (fast fermenting bacteria). It is this last group of organisms that we need to dominate the fermentation if we want to maximize our returns.

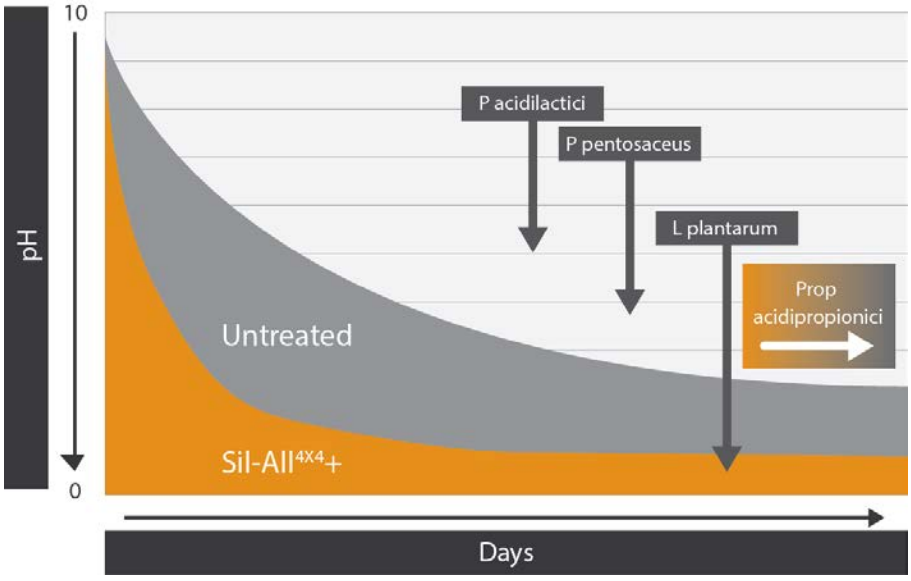
The Enterobacteria are very wasteful in their growth. They use the sugar that is present in the fresh forage and produce ethanol, acetate, succinate, formate, gas and small levels of lactic acid. They produce a very limited fermentation with only a small pH fall which does not protect the forage. Enterobacteria often account for the majority of all the bacteria found on fresh grass.

The second group of bacteria is the heterofermentative Lactic Acid Bacteria (LAB). These bacteria are Lactic Acid Bacteria, but are not as efficient at fermentation as they convert the sugar to both the desirable lactic acid but also to the undesirable acetic acid, ethanol and carbon dioxide (acetic acid is a *weak acid* – it doesn't pickle the grass effectively. However some of these bacteria do still have their rightful place in the silage world, but should be used where there is risk of the silage heating (high dry matter forages, slow feed out rates etc). For most grass silage this is generally not an issue.

The last group of bacteria is the homofermentative LAB – these bacteria are the efficient fermenters. These convert sugar directly to lactic acid and maximize the milk potential of your silage both by maximizing maintenance of your dry matter but also by maintaining the protein, energy and digestibility of the ensiled grass.

Why the power of 4 ?

Just like humans, who have evolved and adapted to the region of the globe they live in; bacteria are adapted to a very specific environment –and they operate most effectively in their own "happy" comfort zone When we make silage we take fresh forage that has a neutral pH and drive the pH down as fast possible. The bacteria present in Sil-All 4X4+ have their optimal pH ranges where they work and most efficiently produce the lactic acid – their happy environment. By having 4 carefully selected strains in Sil-All 4X4+ we cover the entire range of pH from fresh forage to final silage efficiently and quickly. There is no single bacteria that can cover the entire pH range of fermentation as efficiently as the 4 Sil-All strains.



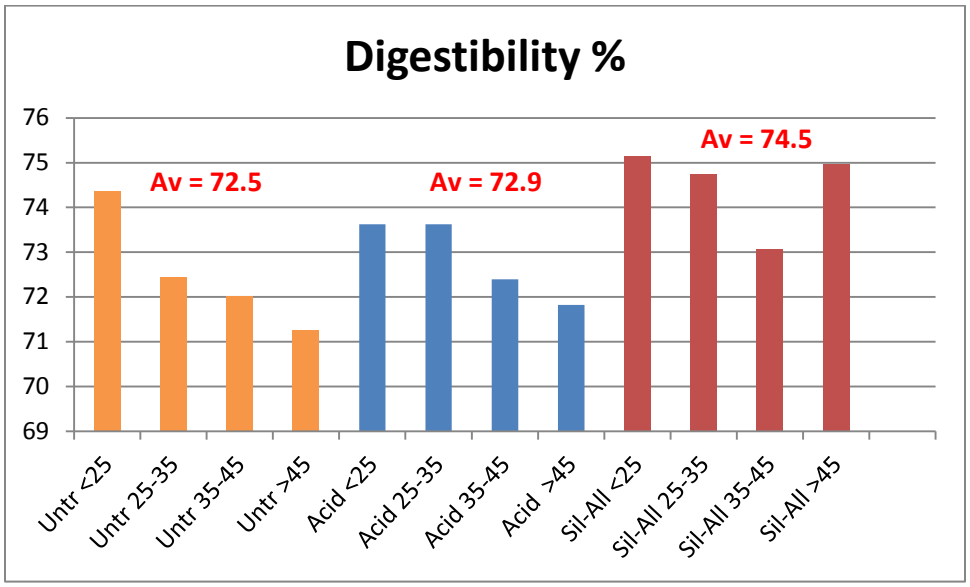
Sil-All 4X4+ has 4 strains, covering different pH scale. Internal source

Great Weather – Great Grass – Great Silage

The better the grass you start with, the better Milk Potential your silage has. We start with sunshine pushing sugar levels high, cutting the grass at the right height (not too low or we get more Enterobacteria in), rapid wilting, clean collection, chopping and application of Sil-All 4X4+ and then rapid fill of the clamp, good compaction, good sheeting –ideally using an Oxygen barrier film, and good weighting down with tyres or gravel bags. This will maintain the optimal Milk Potential of your silage.

Grass is worth more than we realize. The more protein, energy and digestibility we maintain the less concentrate we need to buy – this is the start of the milk potential economics. The more efficiently we make the silage the lower the losses to the environment, and these losses are generally the most readily digestible material – this has a positive effect on the milk production of the animal, and on the feed conversion efficiency of the cow.

What Sil-All 4X4+ does is give nature a helping hand on the fermentation of the grass to better conserve the nutrients that we have already invested our money in. The grass we grow isn't free – the cost of the seed, the fertilizer, the equipment, the diesel in tending and harvesting as well as the time – it all adds up, so the more milk potential we conserve through our fermentation the better the value the silage.



Digestibility comparison of different ensiled forage (2372 samples analyzed). Source: TINE 2015

A review of over ***2300*** independently analyzed samples has demonstrated the value of Sil-All 4X4+ on the maintenance of digestibility of ensiled forage (90% of the bacterial treated silage in Norway is treated with Sil-All 4X4+. The quoted data above is for all bacterially treated forages)

Sil-All 4X4+ has been shown on a ***national*** scale to better maintain the initial digestibility of the ensiled forage by a full **2% of digestibility**. This also correlates to a significant protection of the dry matter (reduction in dry matter losses) through a significantly more efficient fermentation.

The Last Piece of the Jigsaw

Profitability on the farm is about getting as many actions as close to perfect as possible. The modern farmer knows how to look after his land, to select the best equipment, to identify the best animal traits, to read the weather, to understand finance all to get the optimal production from his animals. The average farmer in Europe has a high business skill set. The one thing that brings all this together to make the farm money is the quality of the silage. The best quality silage will give the best quality production. Sil-All 4X4+ is the last piece in the jigsaw to improving farm profitability by bringing together all these improvements.

Numbers game

To maximize the output from the silage by maximizing the nutrient, energy and digestibility conservation we have to out-compete the natural bacteria to ensure the homofermentative bacteria dominate. This is done by selecting the right bacteria, but also by a numbers game. We are applying 1,000,000 bacteria per gramme of treated forage with Sil-All 4X4+ – some companies say you don't need such high numbers but let me ask you a question – if you were going to war would you prefer to have 1,000,000 soldiers on your side or a tenth of that number ?

With Sil-All, we have you covered.