

Root to success

Grass seed for the production of high-quality grass silage



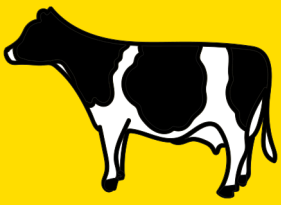
Maximum protein yield



Climate resistant



Efficient nutrient utilisation



Healthier animals

BARENBRUG

The New Grass Technology

NutriFibre® is the new grass technology for grass silage. NutriFibre® is based on soft-leaved tall fescue, originating from Royal Barenbrug Group's international breeding programme, Grass for High-Yielding Dairy Cows. NutriFibre® technology combines efficient mineral utilisation, high energy and protein production, digestible and fibre-rich cell walls, and an extensive root system.

The individual characteristics are enhanced through their interaction, resulting in particularly high-quality silage. Therefore, this specific combination is even more powerful than the sum of its individual characteristics. The new grass technology based on soft-leaved tall fescue has been thoroughly tested under very different conditions, including different soil types and management practices.





Root to success

NutriFibre® is a grass with a strong and extensive root system and easily digestible leaves with a high protein content. With good grassland management, it offers significant yield potential:

Climate resistant NutriFibre® can withstand prolonged drought thanks to its deep root system.

Maximum protein yield Total protein and energy production is high.

E**fficient nutrient utilisation** NutriFibre® uses nutrients efficiently.

Healthier animals NutriFibre® has fibre-rich leaves that stimulate the cow's rumination activity.

Sustainability NutriFibre® grass fields have a lifespan of 4–5 years. This reduces establishment costs.

Grass mixtures containing NutriFibre® provide optimal roughage for modern dairy farmers.
With NutriFibre® technology, dairy farmers get a multi-purpose solution for their farm.
Across Europe, many dairy farmers have already switched to NutriFibre® and are feeding their cows this grass with great satisfaction.



Higher Yield



Total protein and energy production per hectare is higher with NutriFibre®. This means a lower cost per feed unit (FU) compared with other grass mixtures. You can also save on purchased supplementary feed, reducing the cost of producing one litre of milk.

After sowing, NutriFibre® uses a lot of energy to develop its root system. Therefore, growth during the first year is slower than with other grass species. Once the grass has developed a strong root system, the harvest yield is high.

A three-year Danish trial (SEGES) shows that NutriFibre® produces 21% more feed units (FU) per hectare and 26% more protein per hectare than perennial ryegrass.

With good grassland management, the grass maintains excellent quality year after year. NutriFibre® has a long lifespan and provides high yields with unchanged productivity for at least 4–5 years.

Higher milk production

Cows consume more feed when they receive a ration containing NutriFibre®.

In addition, NutriFibre® slows down the passage rate of the entire ration through the cow. This improves nutrient utilisation, allowing the cow to produce more milk (Figure 1).

Besides increasing milk production, a healthy rumen also increases the fat and protein content of the milk.

Lower feed costs

Grass silage containing NutriFibre® reduces the cost of purchased feed. Fibre is essential in a balanced feed ration. Grass silage containing 20% NutriFibre® can fully replace 1 kg of traditional fibre sources.

Fertilisation	200 kg N/ha	400 kg N/ha
	Dry matter yield	
Perennial ryegrass	2.0 ton/ha	2.6 ton/ha
NutriFibre®	2.4 ton/ha	2.9 ton/ha

Table 1:
Difference in protein yield between NutriFibre® and perennial ryegrass

Source: Louis Bolk Instituut, Netherlands, 2011.



NutriFibre® can fully replace traditional fibre sources such as alfalfa, straw or grass hay.
By replacing traditional fibre sources with NutriFibre®, cows need less concentrate feed because NutriFibre® has an optimal energy and protein composition for high milk production.

This results in cost savings of approximately DKK 2.25 per cow per day. On a farm with 100 dairy cows, this means annual savings of more than DKK 80,000.

Correct establishment – the key to success

Correct establishment is essential for achieving good results with NutriFibre® over the years.

The seeds should be sown at a depth of 1–1.5 cm in an even seedbed with warm and slightly moist soil.

Mixtures containing NutriFibre® can be sown from mid-March to mid-August. Barenbrug and Allaboutcows recommend sowing 42–45 kg per hectare.

It is equally important to sow the seeds closely together, with the smallest possible row spacing.

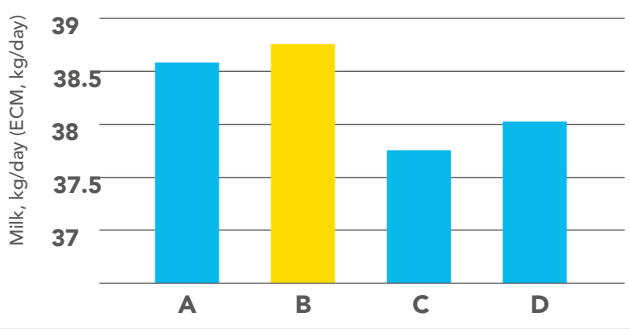
NutriFibre® uses a lot of energy to develop its root system. Therefore, above-ground growth is slower immediately after sowing, which may give weeds more room to establish. After the first few cuts, the grass takes over, and successful establishment follows.

Flexible harvesting time

The harvesting time is flexible because NutriFibre® develops its seed heads more slowly before the first cut compared with, for example, festulolium.

NutriFibre® only develops seed heads once. This means you are less dependent on weather conditions and have a greater guarantee of producing high-quality silage.

Figure:
Higher milk production with NutriFibre®



A = Mixture with perennial ryegrass and white clover
B = NutriFibre®
C = Mixture with perennial ryegrass, hybrid ryegrass, red clover and white clover
D = Mixture with festulolium, perennial ryegrass, white clover and red clover
Source: SEGES 2015, Denmark.

Drought Resistance



Soft-leaved tall fescue (NutriFibre®) can withstand prolonged drought. When rainfall is low, the grass obtains water from deeper soil layers. Trials with tall fescue show that the grass produces as much as 47% higher yields during dry summer months. An additional advantage is that drought does not cause damage that would allow weeds to establish.

The importance of good grass in feed production is becoming increasingly significant.

With soft-leaved tall fescue using NutriFibre® technology, dairy farmers can achieve higher milk production. Trials conducted by Ghent University in Belgium have shown that tall fescue can produce higher yields than perennial ryegrass during dry periods.

Table 2 shows the yield results from a trial conducted over three different years. Several periods of drought were recorded during the trial.

The results showed significantly higher yields from tall fescue than from perennial ryegrass.

One of the conclusions was that tall fescue has greater drought tolerance than perennial ryegrass. NutriFibre® is therefore particularly suitable for dry summers.

Year	2010	2011	2012
Perennial reygrass	13,7	11,8	12,6
Tall fescue	15,5	14,4	17,0

Table 2:
Difference in dry matter yield during specific years with prolonged drought periods (tonnes/ha)

Source: Ghent University, Belgium, 2013.



Wet Periods
During extremely wet periods, NutriFibre®'s long roots have a drainage effect.
This ensures excellent drainage in fields with NutriFibre®, helping the grass remain in good condition.
As a result, NutriFibre® survives wet periods better than perennial ryegrass, and damage to the grass sward is limited.

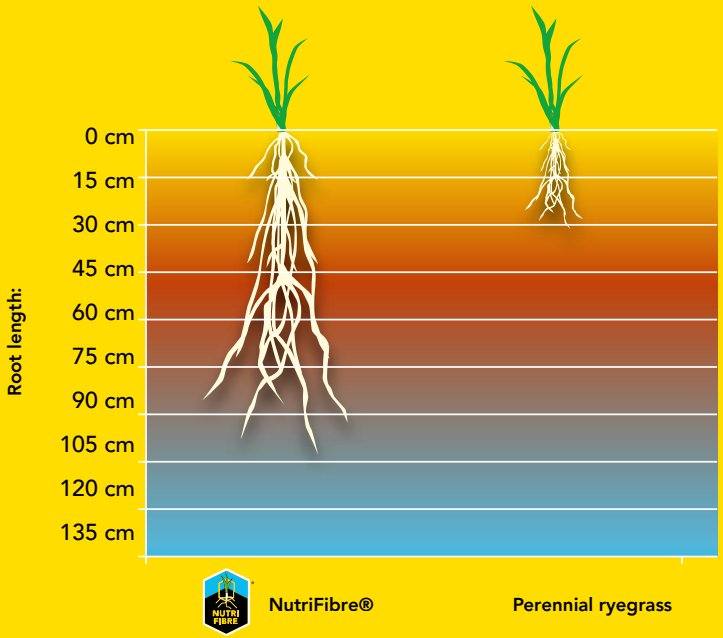
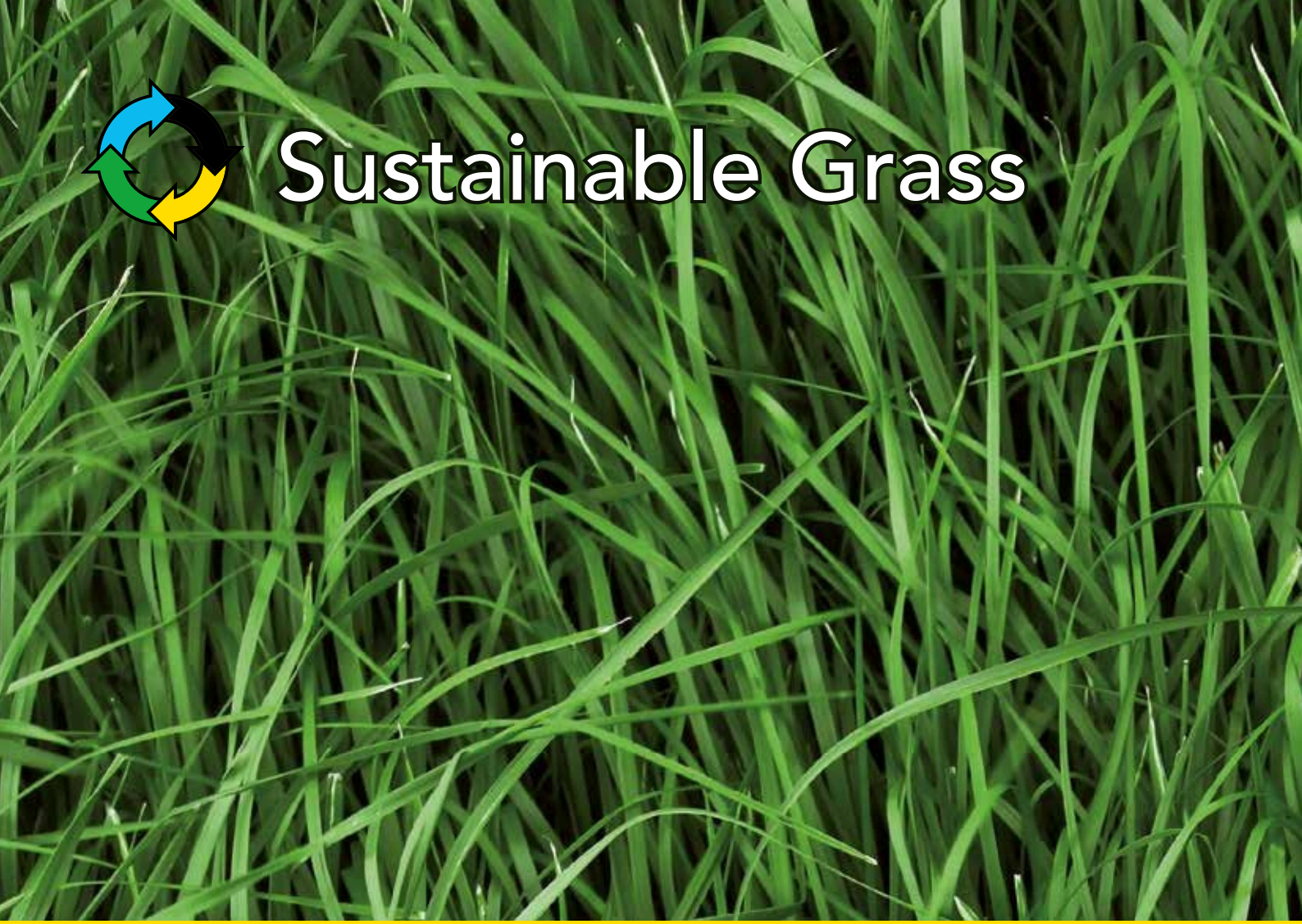


Figure 2:
Difference in root length between NutriFibre® and perennial ryegrass



Sustainable Grass

NutriFibre® uses nutrients efficiently. Together with good farm management, this ensures that fewer nutrients are leached from the soil.

NutriFibre®'s deep roots make optimal use of the applied fertiliser. If soil conditions allow, NutriFibre® roots can reach depths of up to 100 cm, while perennial ryegrass roots reach an average depth of 25 cm.

NutriFibre® therefore utilises up to 96% of all nutrients (nitrogen, phosphate and potassium) in the soil.

Optimal phosphate utilisation

Phosphate is a particularly important topic due to the expected global shortage of phosphate.
This means that it is necessary to make better use of available phosphate.
NutriFibre® is an excellent solution.

NutriFibre® plants absorb 15% more phosphate with their long roots.
NutriFibre® is also able to utilise phosphate found in deeper soil layers and convert it into additional plant growth.
Therefore, NutriFibre® provides a higher protein yield per hectare than other grass species (see Figure 3).

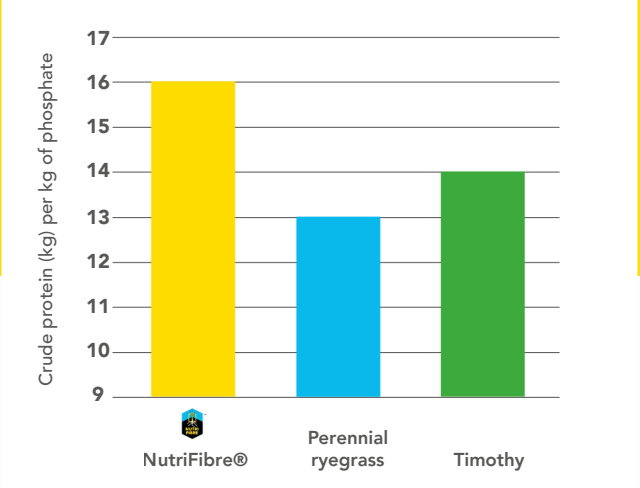
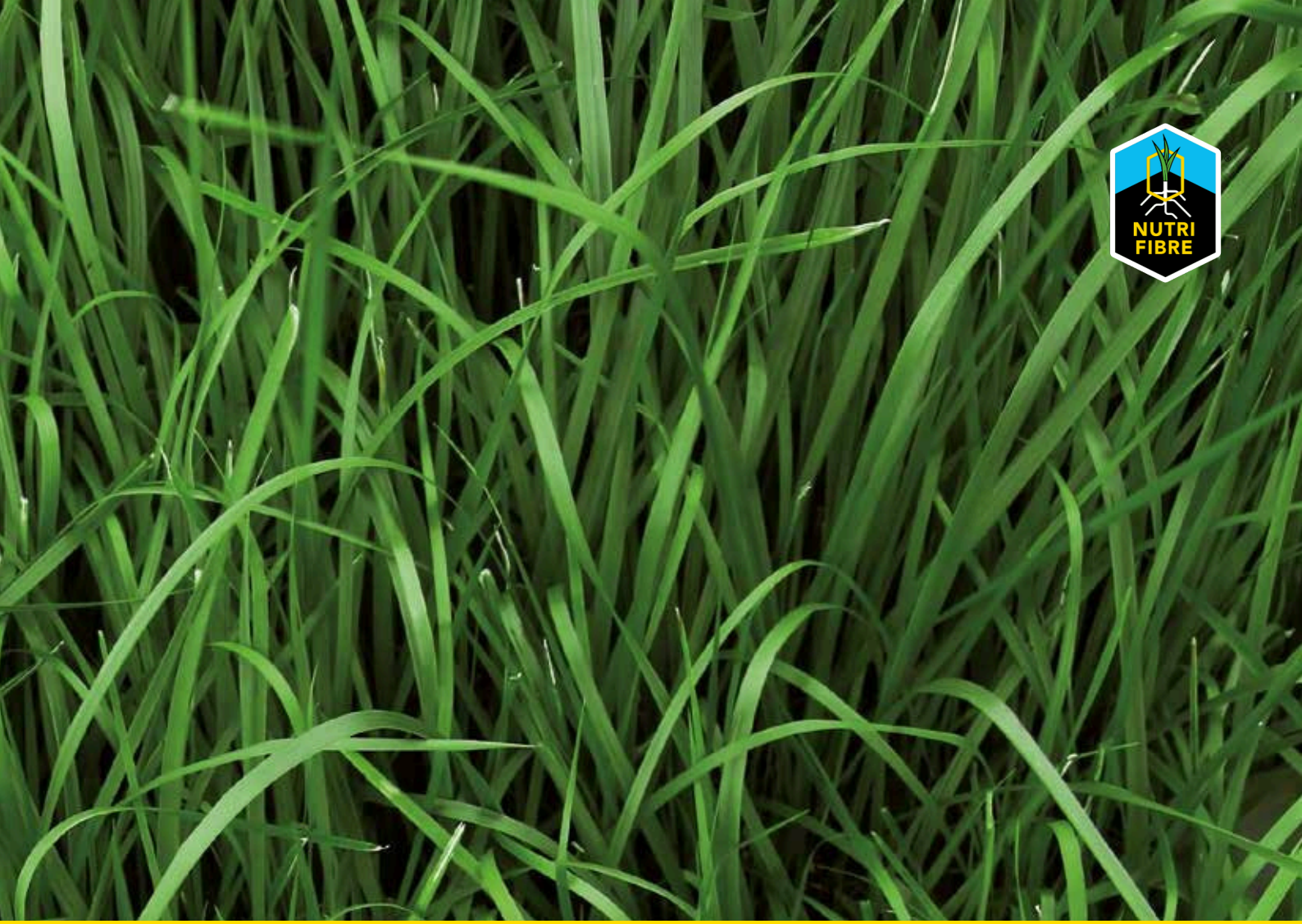


Figure 3:
Difference in crude protein production per kg of phosphate



Nitrogen Utilisation

Trials conducted by the Dutch Louis Bolk Instituut in 2011 show that NutriFibre® produces more grass per hectare than other grass species when supplied with the same amount of nitrogen (see Table 3).

With NutriFibre®, you can therefore save on purchased nitrogen fertiliser or protein-rich supplementary feed.

Table 3:
Forskel i tørstofudbytte gennem større mineraleffektivitet

Fertilisation	200 kg N/ha	400 kg N/ha
	Dry matter yield	
Perennial ryegrass	10,3 ton/ha	12,2 ton/ha
NutriFibre®	13,8 ton/ha	14,3 ton/ha

Source: Louis Bolk Instituut, Netherlands, 2011.

Fibre Grass



NutriFibre® has fibre-rich leaves that stimulate the cow's rumination activity.
Rumination is essential for maintaining a healthy rumen.
Healthy cows produce more milk.

Subclinical rumen acidosis frequently occurs in many dairy herds.
Rumen acidosis mainly affects high-yielding dairy cows receiving energy-rich feed (too much sugar and starch).
Rumen acidosis leads to lower milk production, milk with lower protein and fat content, and health problems such as reproductive disorders and hoof diseases.
This results in additional costs of up to DKK 1,500–3,000 per cow.

Efficient fibre is found in the leaves

Since NutriFibre®'s effective fibre is found in the leaves, its high fibre content does not depend on the grass producing seed heads first.
NutriFibre® can be harvested before heading and still contain effective fibre. After heading, the feed value of all grasses decreases.

Trials with rumen-fistulated cows

Nutreco in the Netherlands and Barenbrug conducted a joint trial comparing rumination activity in rumen-fistulated cows after consuming different grass species.
The trial showed that cows ruminate more when fed NutriFibre® than when fed grass species with a lower cell wall content, such as Italian ryegrass and perennial ryegrass.

Cell walls

With NutriFibre®, the cow receives a large part of its energy from cell walls because the fibres in NutriFibre®'s cell walls are more digestible than those in other grass species.
Cell walls consist of three different building blocks: Lignin, Cellulose, Hemicellilose.

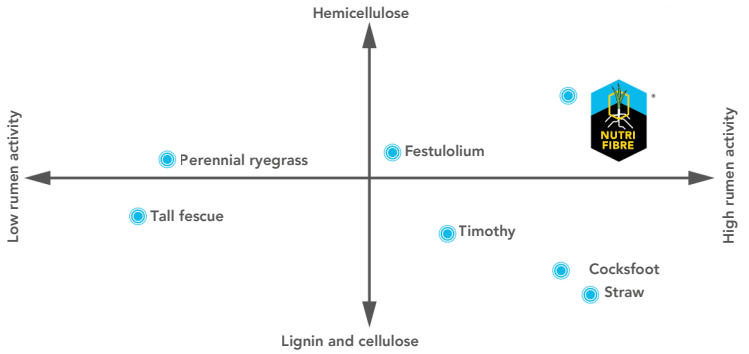
- **Lignin** is indigestible woody material with no feed value for the cow.
- **Cellulose** is broken down in the rumen over 48 hours. However, since feed takes 18 hours to pass through the cow, the cow only has time to digest one-third of the cellulose.
- **Hemicellulose** is broken down within 8 hours, allowing the cow to utilise it completely.

Source: University of Manitoba, Canada.



Most of NutriFibre®'s cell walls consist of hemicellulose.
This is the reason for its high feed value combined with effective fibre. In grasses that have developed stems or other fibrous structures, the ratio between the three building blocks is different, meaning that a large proportion of the feed is not converted into milk.

Figure 2:
Differences in cell wall digestibility and stimulation of rumen activity in different grass species



Source: University of Manitoba, Canada.

Rumen acidosis – how does it happen?
When the feed eaten by cows ferments, fatty acids are produced.
These fatty acids cause the rumen's pH value (acidity level) to decrease.
When the fatty acids are absorbed through the rumen wall, the pH value is restored.
If cows eat too many carbohydrates (sugar and starch), too many fatty acids are produced, causing the rumen function to become unbalanced.
This can be prevented with fibre-rich feed that stimulates cows to chew more.
Intensive rumination increases saliva production, allowing cows to produce their own bicarbonate.
Bicarbonate acts as a natural buffer in the rumen and prevents fatty acids from lowering the pH value.
Fibre-rich feed therefore ensures balanced rumen function and helps prevent rumen acidosis.

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Efficient nutrient utilisation NutriFibre® uses nutrients efficiently.

Healthier animals NutriFibre® has fibre-rich leaves that stimulate the cow's rumination activity.

Sustainability NutriFibre® grass fields have a lifespan of 4–5 years. This reduces establishment costs.

You can purchase grass mixtures containing NutriFibre® from:

Allaboutcows

Håndværkervej 2-4
Haverslev
9610 Nørager
Denmark
Tel. +45 5885 9530
www.allaboutcows.dk



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Barenbrug T +31 (0)24 348 81 00 E info@barenbrug.biz W www.barenbrug.dk