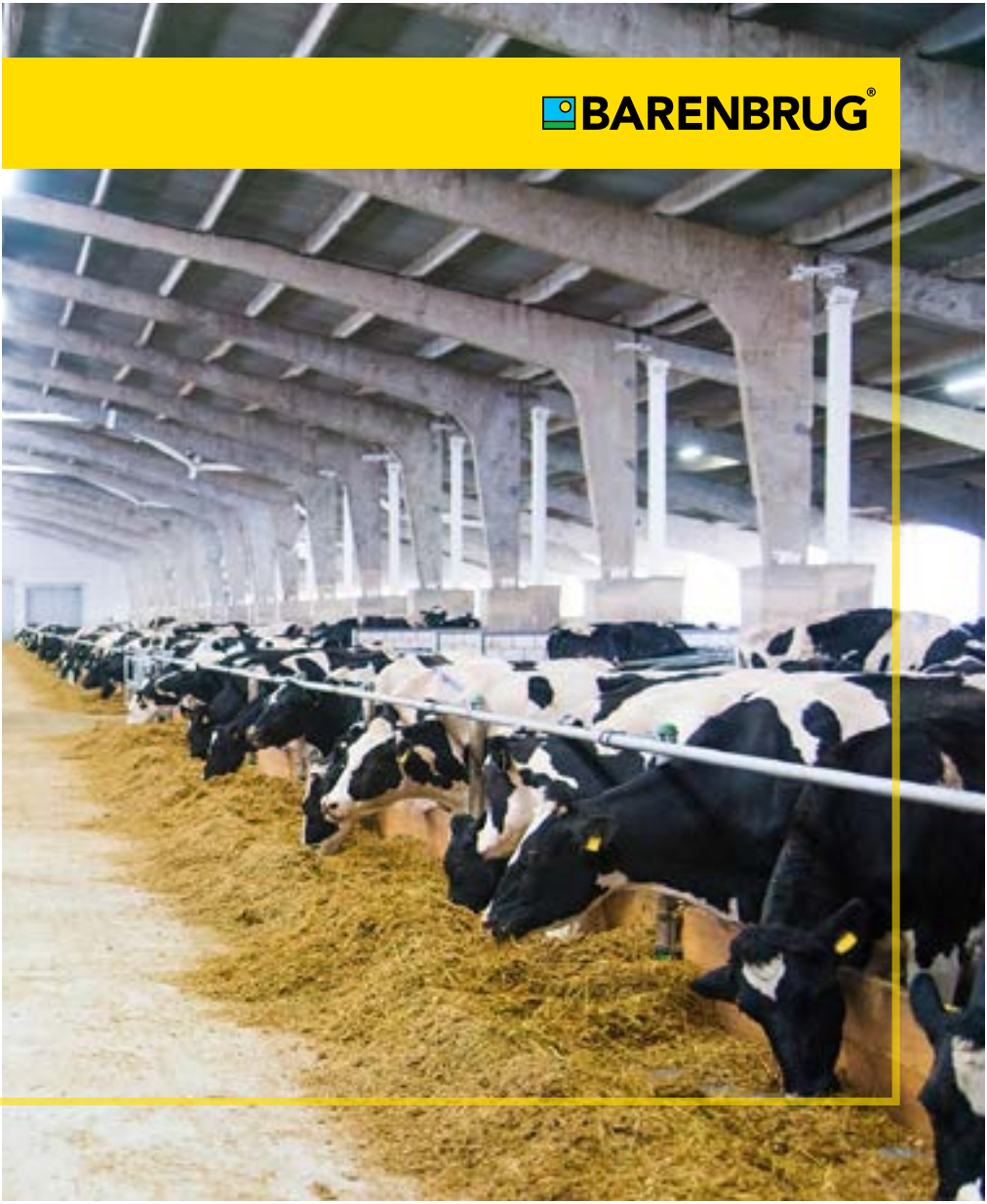
BARENBRUG®



NutriFiber

Highly Digestible Grass by BARENBRUG®

What is NutriFiber?

NutriFiber® is a product line of modern forage grasses developed by Barenbrug to provide physically effective, high-digestible fiber for today's high producing cows. By providing both non-fiber carbohydrate and Neutral Detergent Fiber, NutriFiber grasses greatly help today's modern dairies.

Contents

Acronyms:

NDF	Neutral Detergent Fiber
NDFd	NDF Digestibility
TTNDFd	Total Tract NDFd
NFC	Non-fibrous Carbohydrate
peNDF	Physically Effective NDF

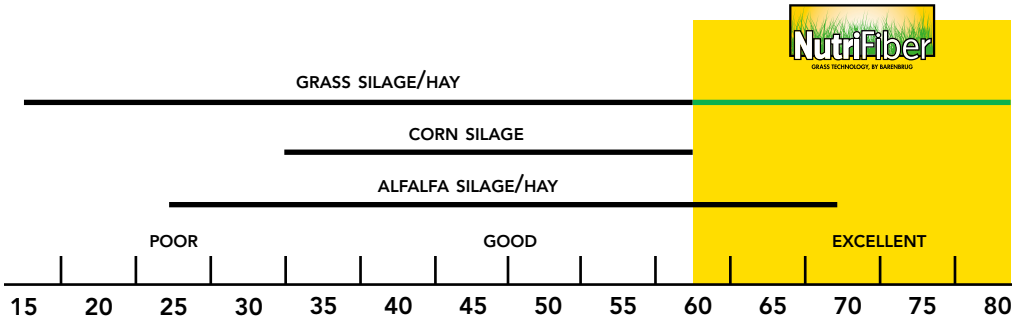
The New Tool to Compare Forages

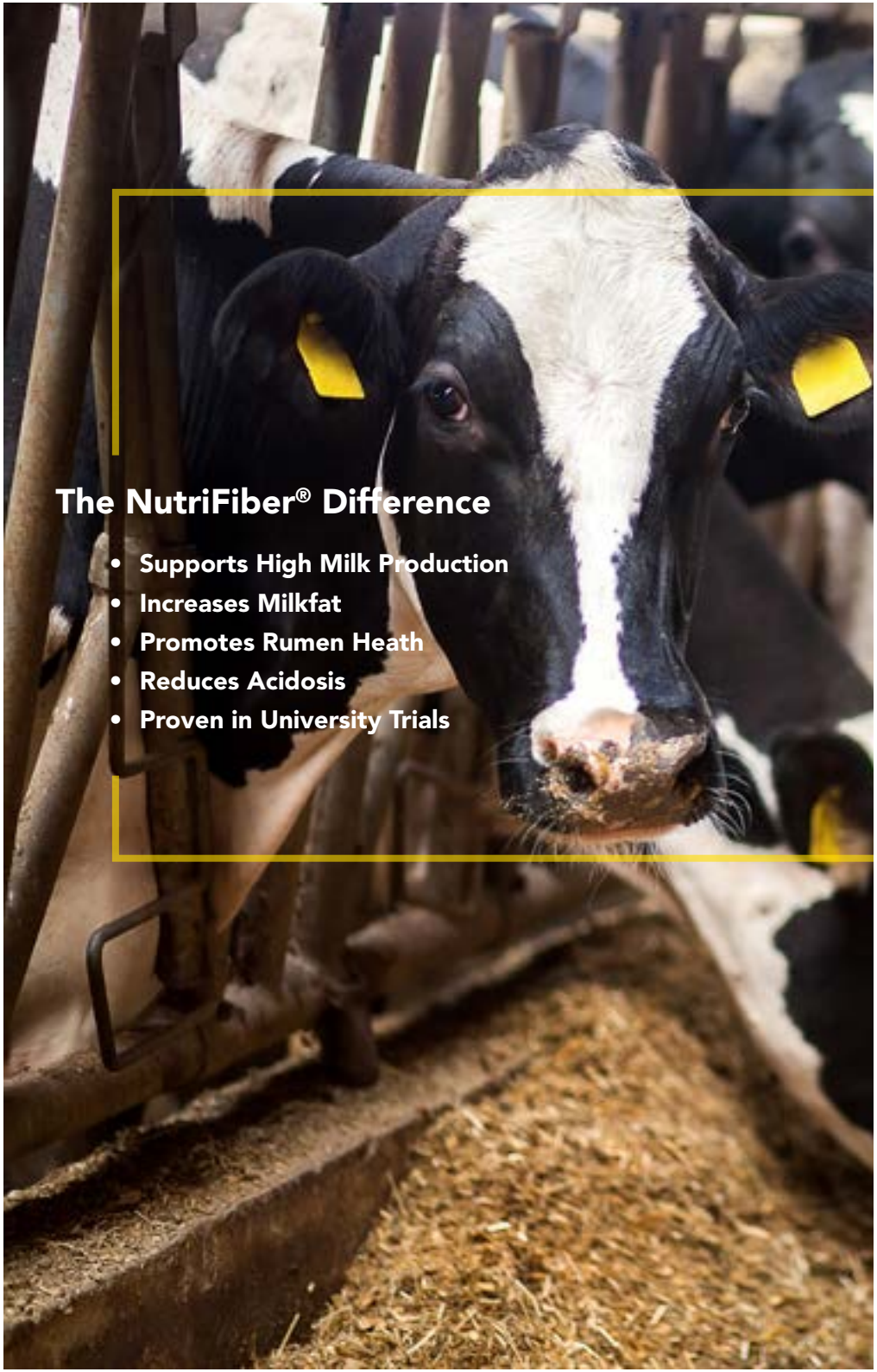
Plant fiber is a complex material that varies greatly in its digestibility. NDF is a forage test that measures the total amount of fiber in a feed. It has been understood for a long time that NDF is a measure of the "bulky," slow-to-digest feed component. The higher the NDF value, the less an animal could consume and the lower the forage quality. Some forages, such as cool season grasses, have higher NDF content than alfalfa, and have been considered lower quality as a result. This, it turns out, is an over-simplification. The truth is that NDF values cannot be compared between forage species. Not all NDF is create equal. Optimizing forage utilization by dairy cattle requires knowledge of the NDFd and the rate at which it digests.

Relative Feed Value (RFV) has been widely used to rank forages for pricing, harvesting and allocation of forages to different groups of animals. It was largely influenced by Acid Detergent Fiber (ADF) and NDF values. Relative Forage Quality (RFQ) was developed as an improvement on RFV. The RFQ value incorporates digestible fiber, making it a better indicator of how an animal would perform on a given forage. But a basic limitation of RFQ is that NDF values from alfalfa, corn silage and grasses cannot be directly compared.

The TTNDFd index developed at the University of Wisconsin is a new tool that permits comparisons of fiber analyses from different forages. The TTNDFd provides better predictions of milk production from fiber analysis and shows that NutriFiber forages supply higher energy due to their high fiber digestibility.

This new forage quality assay can also be used in developing new varieties as a selection criteria in breeding programs. The NutriFiber mark is your assurance that your forages have the highest genetic potential of producing the highest TTNDFd ration forage components for your high-producing cows. The graph below shows the variation of digestibility in forages. Less than 40% TTNDFd represents poor fiber digestion and over 50% TTNDFd indicates excellent forage fiber digestibility. NutriFiber forages range between 60-80 TTNDFd (% of NDF).





The NutriFiber® Difference

- **Supports High Milk Production**
- **Increases Milkfat**
- **Promotes Rumen Heath**
- **Reduces Acidosis**
- **Proven in University Trials**

"The economic cost associated with SARA can be staggering. It is estimated that SARA costs the North American dairy industry between $500 million and $1 billion (U.S.) annually, with the costs per affected cow estimated at $1.12 per day."

Ontario Ministry of Agriculture, Food and Rural Affairs

Balance High Energy Rations

Rations frequently contain too much NFC and too little highly digestible, physically effective fiber. Unlike commonly utilized feedstuffs, NutriFiber is ideally composed to properly balance high energy rations for today's high-producing dairy cows.

Feedstuffs Used to Add Fiber Lower NFC

	NDF % of DM	TTNDFD % of NDF	NFC % of DM
Ration Guidelines	30	>42	38-40
Corn Gluten Feed	35	51	31
Beet Pulp	46	70	36
Soy Hulls	60	75	18
NutriFiber Forages	40-50	45-60	18-25

High producing ruminants are often fed diets that contain large amounts of grain, which leads to consumption of too much non-fiber carbohydrate (NFC) and not enough physically effective fiber (peNDF). A lack of highly digestible peNDF plus an excess of NFC can lead to an unhealthy rumen and a condition known as subacute ruminal acidosis (SARA). Cows with SARA are prone to hoof problems, milk fat depression, higher cull rates, transient diarrhea, unexplained death loss, clostridial infections and liver abscesses.

Forages low in NDFd, such as mature alfalfa and grasses, corn stalks or even wheat straw, will provide fiber but can limit feed intake due to slow passage rate. The NDFd of commodities like corn gluten feed and beet pulp are high, but their total NDF content is relatively low and their NFC content is high making it difficult to achieve the ration target. Soy hulls do contain a relatively high amount of NDF that is highly digestible and have a low content of NFC, but they are low in pdNDF that cows need for cud chewing and proper rumen function.

Acronyms:

NDF	Neutral Detergent Fiber
NDFd	NDF Digestibility
TTNDFd	Total Tract NDFd
NFC	Non-fibrous Carbohydrate
peNDF	Physically Effective NDF

"NutriFiber grasses have been developed to have higher fiber digestibility than alfalfa, corn silage, and other grasses."

Dr. David Combs
University of Wisconsin-Madison

Improve Long Term Health

Rumen acidosis is a metabolic disease of cattle, occurring when the pH of the rumen falls to less than 5.5 (normal range is 6.5 to 7.0). Like most metabolic diseases for every cow that shows clinical signs, there will be several more which are affected sub-clinically. The primary cause of acidosis is feeding a high level of rapidly digestible water-soluble carbohydrate. Acute acidosis often results in death. A milder form, called Subacute Ruminal Acidosis (SARA), is seen in dairy cattle. Feeding NutrFiber forage, with more digestible physically effective fiber than roughages like wheat straw can help to reduce acidosis.

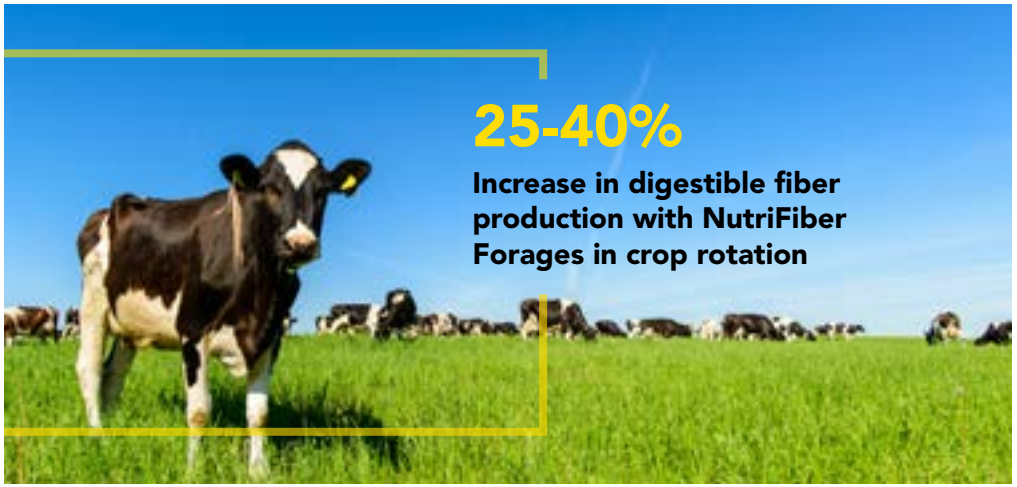
NutriFiber Forages:
Higher Digestibility Similar NDF

	NDF Range %	TTNDFD % of NDF
NutriFiber*	46-56	59.5
Other Grasses†	46-56	48.3

Forage samples submitted to Rock River Labs, Watertown, WI in 2012
*Values from nine samples
†Values from 448 samples

SARA: Subacute Ruminal Acidosis

- Extended periods of ruminal pH below 5.5-5.6
- Reduced feed intake
- Transient diarrhea
- Reduced milk production and milkfat
- Poor immune function
- Laminitis/Lameness



NutriFiber®

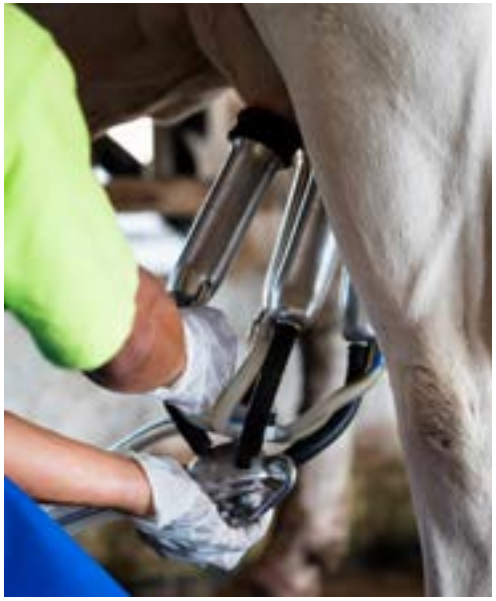
Livin' the Cream:
Increase Milkfat and Maintain Milk Production

On average 50% of milkfat is made from short-chain fatty acids, specifically acetate and butyrate. These are primarily made in the rumen from the fermentation of fiber. Adding NutriFiber to the ration increases the digestible fiber that produces these substrates for milkfat production.

A study conducted at the University of Wisconsin replaced equal portions of corn silage and alfalfa silage with NutriFiber silage. The resulting treatment ration contained 2% more NDF and 2% less NFC (of the ration dry matter). Small changes can produce big results! During the first period of the test, cows on the treatment diet produced milk with 0.5% higher fat test (3.5 more pounds of 4% Fat Corrected Milk per day), a statistically significant effect. After 2 months, the treatment and control groups were switched. The effect of switching diet was pronounced. Removing NutriFiber silage from their ration reduced fat test by 0.35%. Adding NutriFiber silage increased fat test by 0.35%. A clear demonstration of the value of NutriFiber!

"A 2-3 unit change in fiber digestibility corresponds to 1 lb. change in milk yield."

Dr. David Combs
University of Wisconsin-Madison



Improve Management and Farm Profits

- Corn silage yields are increased by 25% when grown in rotation with NutriFiber products
- Highly tolerant to traffic, allowing multiple manure applications
- Less susceptible to manure-related disease than alfalfa
- Reduce fertilizer needs and nutrient loss
- Better phosphorous uptake reduces runoff compared to warm season grasses and corn
- Advantages of mixed NutriFiber and alfalfa stands:
  - Faster drying time
  - Increase longevity
  - Higher yield

The NutriFiber Family of Products

Green Spirit® - *Italian Ryegrass*

As a perfect blend of diploids and tetraploids Italian Ryegrasses, Green Spirit provides excellent quality forage for up to two years, depending on climate and available moisture. Due to its quick regrowth, very early development in spring, and prolonged growing period in the fall, this species usually has greater overall productivity than other cool season grasses. When planted in the spring, Green Spirit will not go to seed in the first season, resulting in high quality forage production without the low quality stems and seed heads during the first year.

Seeding Rate: 30-35lbs/acre

E² 631™

E² 631 is a blend of hybrid alfalfa using the hybrid alfalfa technology (msSUNSTRA®), and late heading STF-43™ and HLR™. This combination results in high tonnage per acre throughout the season with a good balance of grass and alfalfa in the hay. E² 631 was formulated for dry hay production. E² grasses grow in the same rhythm as alfalfa, and increase yield and stand longevity compared to alfalfa planted alone.

Seeding Rate: 25lbs/acre

E² 640™

E² 640 is a blend of hybrid alfalfa using the hybrid alfalfa technology (msSUNSTRA®), and late heading STF-43. This blend was specifically formulated for high quality dairy silage as the STF-43 increases digestibility. We crafted this blend to provide you with a high energy, consistent quality silage from each and every cut throughout the season. E² grasses and alfalfa are formulated for sowing in a single pass in one drill box.

Seeding Rate: 25lbs/acre

Milkway™

As a blend of late maturing soft leaf tall fescues and meadow fescue varieties, Milkway preforms well as a standalone hay crop or is an excellent companion with alfalfa. Combining high yielding meadow fescues with extremely digestible soft leaf tall fescues, Milkway provides exceptionally high NDFd and thus an improved rate of digestion while the soft leaf tall fescues provide stable NDF and NDFd throughout the season. Milkway in a dairy TMR can improve milk production 5%–15% over traditional wheat straw diets. Milkway brings increased production and high quality forage to your hay fields.

Seeding Rate: 20-25lbs/acre

STF-43™ - *Soft Leaf Tall Fescue*

A premium blend of late maturing soft leaf tall fescues, STF-43 is composed of varieties that provide exceptional levels of dry matter and digestible fiber. As part of our NutriFiber family of products, STF-43 promotes rumen health and productivity. These varieties provide exceptional levels of digestible fiber per pound of dry matter fed. STF-43 is also well suited for cutting systems and is an excellent selection for planting with alfalfa and other legumes.

Seeding Rate: 20-25lbs/acre

BARENBRUG®

Make Life Beautiful

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