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"It is the crops that feed the cows that make the milk which creates

Advanced Ag Systems
Research, Education, Consulting

Maximize Dairy Profit and Output by Maximizing Digestible Forage Fiber Input

Milk prices are down and putting a squeeze between the dairy and the concentrate purchased to maintain milk production. One advantage of being around for a long time (when we milked mammoths) is that we have seen this before. It doesn't make it any more pleasant. The early 1980's were very hard times with many farms not making it. We had a repeat scenario in 2014 when grain prices went through the roof. We are seeing a version of this again in 2024. Ironically the breakthrough we had in early 2000 is still viable today.

A key has been to feed cows as cows. They are fiber digesters and the more digestible forage that is included, the greater the benefit. On farms we worked with they documented increased components as they switched to higher digestible fiber from forage, they got more money for their milk. Healthier cows reduced culling which meant less heifers needed to be carried to maintain herd numbers. Dr. Chase of Cornell in a study of high forage fiber farms also found fewer metabolic disorders and acidosis. This meant fewer foot problems and lower vet costs. The lower vet costs were a striking factor in the farms we worked with. Dr. Chase and our work found that there was a significant increase in income over feed costs. In other words, the bottom line got better! A group of farms for which high digestible fiber forage diets are critical are the organic dairies. Their grain costs are tremendously high. **Substituting high digestible fiber forage can meet the animal's needs for high production without sending so much of your milk check to someone else.**

Forage feeding level is not something you magically pull out of the air and start stuffing into the cows. Page 125 of the Dairy Reference Manual shows the % NDF feeding level able to be fed depending on the size of the cow and the **weighted NDF of the forage fed**. In the table at the right, the NDF forage feeding levels are inputted into a ration for a 1600 lb. cow. Note: all three levels of forage feeding **are balanced rations**. Which one does your nutritionist choose?

$$\frac{\text{Body weight} \times \text{NDF target}}{\text{Weighted Forage NDF}} = \text{Lbs Forage Fed}$$

| Target NDF Forage Fed | Forage NDF as % Body Weight | Lbs. 40 NDF Corn Silage | Lbs. 40 NDF Haylage | Lbs. Forage Dry Matter |
|-----------------------|-----------------------------|-------------------------|---------------------|------------------------|
| Minimal | 0.0075 | 20 | 10.00 | 30 |
| Average | 0.0095 | 24 | 14.00 | 38 |
| Moderate High | 0.01 | 26 | 14.00 | 40 |

Achieving the profitability of a high-forage diet takes two key people; the farmer that makes the forage and the nutritionist that balances the ration. The nutritionist, if they are on board with the effort, can only be as good as the forage they have to feed. The forage program is critical in getting forage quality to the mouth of the cow (the only place it counts).

Having calculated for multiple farms over multiple years, it is consistent that the cost of nutrients from forage is much less than from concentrate. Of course, if you farm with no soil test, a better equipment lineup than the machinery dealer, and a harvest that goes by date like grandpa did - not quality, and laying the haylage in windrow to compost dry over 3 days, the cost of your nutrients in the forage could be more than the purchased concentrate.

It may shock a few nutritionists, but the **soils drive the rotation, which drives what the cows are fed** – it is not the nutritionist. One farm was growing 60% haylage and 40% corn silage (best rotation for their soil type). The nutritionist was feeding 60% corn silage and 40% haylage and they were wondering why they were always running out of one of the feeds. You need enough forage and all must be high quality to support maximized feeding. As a farmer you need to grow the quality digestible fiber forage that is best adapted to your soil and environment. This is why we actively developed the best management practices for alternative crops that are proven to produce very high-quality high digestible forage such as wide swath same-day haylage, flag leaf winter triticale forage, male sterile BMR sorghum with enhanced nutrition, red clover; and high digestibility cool season grasses. Each can support high-forage diets but is adapted to soils/environments where alfalfa and /or corn may not do as well.

Grain types for silage or dual-purpose types for corn silage is 1950's technology that can only support a low-forage diet. Growing appropriate season, high fiber digestible, soft kernel corn varieties will allow it to be harvested at optimum quality instead of waiting a month after everyone started before you can chop wet butyric stuff. That promised extra yield is not worth it and simultaneously kills the profitable crop that hundreds of farmers have tapped by following a slightly shorter season corn crop with high-quality winter triticale forage.

Harvesting haylage by wide swath same-day practices allows faster harvest and has been proven to **increase the energy level of your alfalfa by 25%** to nearly that of corn silages. This supports higher forage feeding which supports much higher milk production from your haylage. Mowing directly to a windrow and then composting it for 2 -3 days to reach 35% DM before chopping will never get you to high forage feeding opportunity. Both of these factors, corn silage variety selection, and haylage harvest method, are factors **you control**.



Wide swath (90% of cutterbar width) with no conditioning dries to 35% DM often in 3 hours. Narrow swath on the right takes 24 or more hours to reach the same DM. Wide swath with photosynthetic drying boosts milk energy 25%

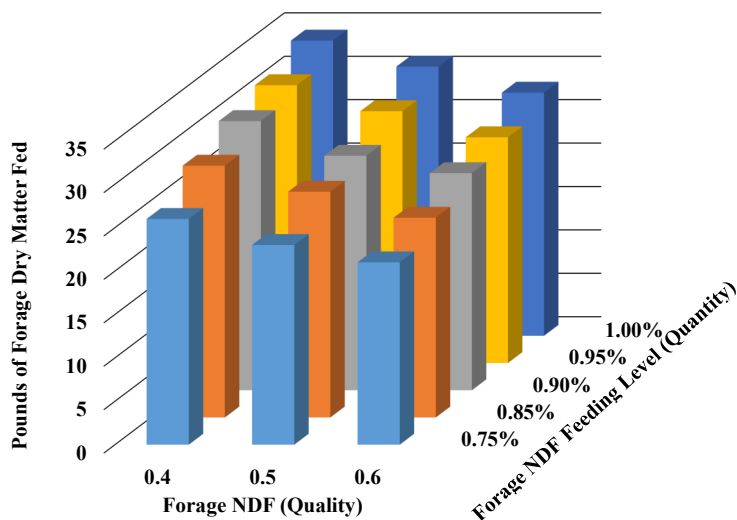
Your nutritionist needs to be fully on board. One farm thought they were feeding high forage until we looked at the ration. The nutritionist had it balanced for 1350 lb. animal. The farmer and his wife taped all their cows and found the average was 1600 pounds/cow – it was not a high-forage diet. For this to work you must start with accurate, not guessed, numbers. Another nutritionist who didn't want it to work simply threw in more forage without rebalancing. He knew it would crash the cows then he can say it does not work. Some give the excuse their computer doesn't go that high. Many excellent dairy nutritionists have the skill, experience, and drive to meet your farm's objective of high digestible fiber forage feeding the highest forage fiber quality you can produce. If yours doesn't, find one that will.

You have to take steps to increase forage fed. As mentioned above, the first is quantity of quality forage from timely harvest. Then it needs to be preserved utilizing a proper inoculant and packing in the storage. Nearly all steps are your management, not something you buy. The cows will start eating more of better quality forage. Dr. Chase of Cornell recommends a **2% step increase at a time and the ration rebalanced** at each step. The cows may slightly decrease due to change, and then significantly increase production after that but do it on more forage. As you work with your nutritionist to step up the forage feeding levels, as the cows adjust they will eat more. It is not done overnight.

As your forage digestible fiber increases you will need to adjust your management to take advantage of it. Dumping highly digestible forage fiber in the rumen enables it to quickly flow through and out of the rumen before the nutrients can be fully digested and utilized. Work by Dr Grant of Miner Institute found that as the **forage digestible fiber increased, the length of cut needed to increase**. A 3/4 to 1 inch length of cut will **increase the peNDF** for a better rumen mat and greater extent of digestion before it is washed out of the rumen. A 1 inch length will not increase sorting. For highly digestible forages like winter triticale at flag leaf stage or enhanced male sterile BMR sorghum, the **increased length of cut** has the added benefit of **dramatically reducing silo leachate**. As our winter forage yields have increase to 4,5, and now 6 tons of dry matter per acre, it is increasingly difficult to get it quickly dry for ensiling. The one inch length of cut and increase moisture allows it to be successfully ensiled without nutrients leaching out of the silo (wet forage not suggested for up-right silos). You can burn through a lot of highly digestible fiber without getting the nutrient benefit if you short cut it. Adding a small amount of chopped straw will Band-Aid the issue but the long term answer is to increase the length of chop at harvest.

Combine the two factors of forage quality and NDF feeding level; and a moderately low forage quality diet fed at a typical low forage feeding level when transitioned to a high forage diet of high forage quality, **will consume 32% more forage** (graph at right) while producing equal or more milk and clearly more components from healthier cows. It may seem common sense, but you have to **produce it before you feed it**. Farmers are often shocked to see how fast the end of the forage supply comes when feeding a high-forage diet. When it is all put together, the shift in profitability is impressive.

Forage Needed by Forage Quality and Feeding Level



Sincerely,

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**The Helping
Hand
to Better
Agriculture**

