

WET AND WILD

Several weeks ago we received a phone call from Dr. Howard Redlus of Mt. Holly, NJ. Howard is a veterinarian and consultant who is part of the Dairy Production Consultants (DPC) team that regularly holds seminars on production medicine. Today, Howard's conversation progressed as follows:

- Howard: What can you tell me about cranberry sauce?
- DHIA: You mean aside from the fact that it's served with turkey on Thanksgiving?
- Howard: Ha Ha, what about feeding it to cows? I have a client who is currently feeding 2 lbs. of cranberry sauce per cow per day. They're considering increasing it to 5 lbs. per head.
- DHIA: Well, we're never analyzed it before, nor have I ever seen any feed values for it. I imagine it's not very high in protein, fiber or minerals. It's probably mostly water and carbohydrates. How is it being fed?
- Howard: They top dress the corn silage with it.
- DHIA: That's probably the best way. How do the cows like it?
- Howard: They eat it fine.
- DHIA: One thing that's of particular interest to me: How is it delivered to the farm and how is it stored? All that I can picture is a dump truck load of sauce being dumped onto a concrete pad or pit. I would guess that whatever the storage conditions, it would have to be fed out fairly fast.
- Howard: Actually, the cranberry sauce is delivered in cans.
- DHIA: (Pause for a moment of disbelief). You mean that they currently open 2 cans/cow and are considering going to 5? (Another pause to more fully consider this). I never knew a dairyman who had that much time on his hands. He must either have 1) a lot of kids, 2) a lot of help or 3) a lot of spare time.
- Howard: Actually, they have a lot of time and a lot of help - it's a prison farm.

So, Howard gets the last laugh after all. All I can picture is these inmates sitting on bales of hay and opening cans for the cows. I guess it beats making license plates.

Anyway, here's the analysis.

Nutrient	Cranberry Sauce (DM Basis)
DM, %	35.4
CP, %	0.4
SP, %	50.0
ADF, %	4.1
NDF, %	3.5
Ca, %	0.02
P, %	0.02
Mg, %	0.01
K, %	0.10
Na, %	0.03
Fe, ppm	15.0
Zn, PPM	2.0
Cu, ppm	1.0
Mn, ppm	4.0
S, %	0.01

As anticipated, there were not a lot of nutrients in the sauce. Note that the NDF was less than the ADF. This is probably due to the influence of pectins. Pectins are carbohydrates that act as "cellular gel or glue". This pectin effect (NDF<ADF) is also seen in citrus pulp.

Based on the analyses performed, it's probably safe to assume that the sauce is primarily nonstructural carbohydrates (NSC). This sample is easily greater than 90% NSC and should be a very good source of energy. An estimate of .98 Mcal/lb. was given for ration balancing purposes.

Thus, in a year with a lot of hard grain (of questionable digestibility) in corn silage, cranberry sauce would make a worthwhile addition to this type of ration. Now all you need is a supply and a cheap source of help and you're all set.

GRAIN MIXES AND ENERGY VALUES

The following is reprint of an article from an earlier Forage Lab Newsletter (1/89, No.7).

How is the energy content of my grain mix determined? Sometimes when I have added fat to the grain, the energy value appears lower than I would anticipate.

The NEI of grain mixes is determined by the following equation:

$$\text{NEI, Mcal/lb} = (((81.41 - (0.6 \times (\text{ADF} \% \times .80))) \times .0245) - .12) \times .454$$

This equation (as well as the rest of our energy prediction equations) is based on the generality that as ADF% increases, the digestibility or energy value decreases. This relationship, however, can be influenced by other factors. Compare the feeds in Table 1. to shelled corn and soybean meal.

TABLE 1

Feed	DM		
	ADF, %	NEI, Mcal/lb	Fat, %
1. Distillers Grain with Solubles	18.0	.93	10.3
2. Whole Cottonseed	44.5	1.04	23.1
3. Roasted Soybeans	11.0	.98	20.0
4. Beet Pulp	33.0	.77	0.6
5. Soyhulls	50.0	.80	2.1
6. Shelled Corn	2.8	.92	4.3
7. Soybean Meal, 44%	9.0	.87	1.5

The energy values of soyhulls and beet pulp are much greater than anticipated. This is because they both contain a large amount of highly digestible cellulose in the fibrous fraction. Roasted soybeans, whole cottonseeds and distillers grains contain large amounts of fat, resulting in high energy values.

These factors wreak havoc with the energy prediction equation. Compare the two 18% protein grain mixes in Table 2.

TABLE 2

Ingredient	Percent of Finished Feed	ADF, % DM Basis	NEI, Mcal/lb DM Basis	Fat, % DM Basis
Grain A				
Shelled Corn	34.5	2.8	.92	4.3
Soybean meal, 44%	19.0	9.0	.87	1.5
Oats	15.0	14.0	.79	5.4
Gluten Feed	10.0	11.5	.87	2.4
Distillers	10.0	18.0	.93	10.3
Molasses	7.5	—	.74	—
Minerals	4.0	—	—	—
FINISHED FEED	100%	7.73	.83	3.8
PREDICTED NEI			.81	
Grain B				
Shelled Corn	37.5	2.8	.92	4.3
Soybean Meal, 44%	18.5	9.0	.87	1.5
Soyhulls	10.0	50.0	.80	2.1
Beet Pulp	7.5	33.0	.77	0.6
Whole Cottonseed	5.0	44.5	1.04	23.1
Roasted Soybeans	10.0	11.0	.98	20.0
Fat	2.5	—	2.11	100.0
Molasses	5.0	—	.74	—
Minerals	4.0	—	—	—
FINISHED FEED	100.0	13.52	.88	7.8
PREDICTED NEI			.78	

Notice that Feed B, with the higher fiber value, has the highest energy value. This is the opposite of what would be expected. The inclusion of high fiber and high fat feeds with high energy values generate more energy than what would be anticipated based on the ADF content alone. Note the difference between the actual energy value and the predicted one.

Feed A is a more typical feed and the actual and predicted energy values are much closer.

Thus, energy values are determined from the ADF content of the feed. Factors such as fat content and a highly digestible fibrous fraction of the feed will influence the energy result. If the percentages of the ingredients in the finished feed are known, a hand calculated energy value will always be more precise than a predicted one.

The energy content of finished feeds has always been of great concern. Never before has it been harder to predict. The increased use of fibrous byproducts and fats has made it increasingly difficult to determine. Predicting on ADF alone does not take into account the addition of fat or high fat ingredients nor does it adequately reflect the apparent high digestibilities of some high fiber feeds. We strongly recommend that if you know the percentage of the ingredients in the mix, calculate the energy as outlined above. This will give you an overall better estimate of the true energy value.

We hope that as our knowledge as an industry increases, an improved means of estimating energy will be developed.

ALFAZYME AND ENERGY

Alfazyme is a silage additive that generally decreases the ADF and NDF content of the silage through enzymatic processes. The ADF is typically reduced 0 to 4 percentage points and NDF 3 - 9% points. This

decrease in fiber effectively increases the digestibility. Several researchers who have investigated the product feel that the energy may be more appropriately determined from the NDF, as Alfazyme has its greatest effect on this fraction of the fiber.

Beginning this summer, we will begin experimenting with the determination of TDN and NEI of ALFAZYME TREATED FORAGES from NDF. The equations are those proposed by Mertens in an article from FEEDSTUFFS (Vol. 62, No. 36, p. 12) by Chandler. This only applies to Alfazyme treated silages. All other forages will continue to have their energies predicted from ADF.

Please be sure to adequately mark forages as Alfazyme treated on the sample information sheet. This will insure 2 things.

1. The appropriate NIR calibrations will be used.
2. The TDN and NEI will be predicted from NDF.

We will evaluate the success of these equations throughout the year. Your input is extremely valuable. Let us know how the new energy values are working.

TURNAROUND TIME REVVED UP

One of our goals is to continue providing you with fast, accurate results. In February, our goal was to turnaround samples in 2.0 days. Turnaround time (TAT) is measured as the time from when a sample arrives until the report is completed and mailed.

The lab set a new record for February of 1.8 days. Terrific! The staff did a fantastic job of processing your samples. As a result (and part of the deal) for a great performance, the staff was given off March 20th to celebrate the Vernal Equinox (the first day of spring).

Congratulations on a great job and well deserved break.