

Update and Observations for Fall 2002

IN VITRO DIGESTIBILITIES

In September we began offering a broad spectrum of in vitro digestibility (IVTD) and NDF digestibility (NDFD) services. These include 6, 24, 30 and 48 incubation time periods. Most significantly, we were able to develop NIR services for 24, 30 and 48 hours. This results in a significant time and cost savings for this important new tool. For more detailed information, refer to Newsletter No.25., September 2002.

STARCH DIGESTIBILITY

In energy prediction schemes, starch digestibility in corn silage has always been held constant. From field experience, we know that this is probably not the case as two corn silages with identical nutrient profiles will often perform differently. This can be attributed to differences in fiber and/or starch digestibilities. We have begun measuring fiber digestibility as described elsewhere in this document. Researchers in Wisconsin have taken the first step and given us a method to estimate starch digestibility. Schwab and Shaver have determined that dry matter content has a large impact on kernel, and therefore starch, digestibility. An equation was developed to estimate starch digestibility with changes in dry matter. They have also included an adjustment for whole plant processing. Processing helps improve digestibility by crushing the kernel, particularly in corn silage when dry matter exceeds 35%.

A corn silage analysis now comes with three energy values:

1. Standard NEL
2. Schwab-Shaver NEL (SS NEL)
3. Schwab-Shaver Processed NEL (SS Proc. NEL)

In a lot of cases, the three energy values are the same. For dry corn silages (>35% DM), we recommend using the SS energies accordingly.

Accounting for starch digestibility is another example how Dairy One has adopted a new technology to enhance our ability to determine the energy content of forages.

ENERGY PREDICTION

Due to the drought and other less than favorable conditions impacting the dairy industry this year, we provided **free** IVTD 48 hour analyses with all NIR packages for the month of November. Our goal was to put more information at your disposal during these times of poor forages, low milk prices and higher feed prices than we've experienced in awhile. Hopefully, this additional information would lead to lower costs or improved production to help keep our farmer customers in business.

In our existing energy prediction system, a combination of NDF, NDICP and lignin are used to estimate fiber digestibility. Now, when a IVTD48/NDFD48 or IVTD30/NDFD30 analysis is performed, this information is incorporated into the energy prediction scheme. Using a measured NDFD value over an estimated one should enhance our ability to predict energy. Listed in TABLE 1. is a comparison of the energy values both with and without the in vitro information for common forages analyzed during the month of November.

TABLE 1. November 2002 – Comparison of standard and NDFD48 predicted energies.

Forage	CP%	ADF%	NDF%	% of NDF NDFD48	NDFD48 NEL	Std. NEL
Legume Hay	21.5	29.2	37.6	48	0.63	0.62
MML Hay	16.8	35.2	49.9	50	0.58	0.56
MMG hay	11.8	38.3	59.8	55	0.51	0.51
Grass Hay	11.0	38.7	62.2	57	0.50	0.49
Legume Haylage	21.4	33.8	43.0	51	0.62	0.61
MML Haylage	18.6	37.0	49.3	53	0.60	0.57
MMG Haylage	15.1	38.9	56.6	57	0.56	0.53
Grass Haylage	14.3	38.2	57.9	59	0.55	0.52
Corn Silage	8.5	25.5	43.4	60	0.74	0.73

Energy values in Mcal/lb.

Overall, the energy values compare favorably between systems. The NDFD48 system generated slightly higher values for haylage, but overall the values were similar. This is a good testament to our existing system, for on the average, the predicted digestibilities are generating energy values similar to the measured digestibilities.

WHAT DID WE LEARN BEYOND THE AVERAGES?

1. Low fiber corn silages (20% ADF, 37%NDF) coupled with moderate to high digestibilities resulted in NEL values in the 0.80 – 0.83 range. These are higher than we would normally expect. Until more experience is gained with this new system, discounting these values to 0.77 – 0.78 for ration balancing is recommended.
2. High protein, low fiber hay crops with moderate to high digestibilities often resulted in NEL values in the 0.70 – 0.75 range. As above, experience will dictate the suitability of these values. If uncomfortable, these values could be discounted 5 to 7%.
3. Low protein, high fiber hay crops resulted in some low energy values (0.33 – 0.37).

SUMMARY

At Dairy One, we are continually looking for ways to enhance the information that we provide. We work with a progressive attitude to experiment, test and deliver new technologies to keep the science of ration balancing moving forward. The new IVTD/ NDFD services enhance our ability to determine fiber digestibility. Fiber is the largest portion of forages and the ability to better define its digestibility should enable us to make better use of homegrown forages. This system will continue to be fine tuned as we gain experience. For typical forages, the system works well. For extreme forages (good or poor), in our opinion, the system tends to over or underestimate energy and common sense must be employed when viewing these values. We will continue to monitor and tweak the system as we move forward.

Remember, *nothing ventured, nothing gained*. As your service provider, Dairy One continues to look for ways to better define feeds and enhance your ability to balance rations.