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NRC 2001 Energy Values

On 6/19/01, a new table of energy values began appearing on your forage analysis reports. These values are based on the multiple component digestible energy (DE) concept set forth in the 2001 NRC Nutrient Requirements of Dairy Cattle.

Feed energy values are influenced by dry matter intake. Dry matter intake (DMI) increases along with the level of production. An increase in DMI results in an increase in the rate of passage through the digestive system. As the rate of passage increases, the feed spends less time in the digestive tract thereby reducing the time available for digestion. Thus as milk production, DMI and rate of passage increase, digestibility decreases.

The new table of energy values reflects the decrease in digestibility with increasing milk production. Energy values are discounted based on the theoretical energy requirement for each stated level of production. Energy requirements are based on body weight, milk production, fat test and true protein content of the milk. New sample information sheets specifically request herd averages for breed, body weight, fat test and true protein content. In the absence of specific herd information, breed averages will be used for energy calculations. If no information is given, breed averages for Holsteins will automatically be used in the calculations. On existing Sample Information sheets, the herd information can be written on the comment line.

The energy estimates are based on the latest scientific information available. For Holsteins, use the 120 lb (54 kg) values with extreme caution. Calculation of this value is on the edge of the theoretical limits of the energy prediction scheme. Improper usage could result in high grain feeding levels and the problems generally associated with it. Likewise, for Jersey's, do not use energy values above 80 lb (36 kg) of milk.

Ideally, all feeds used to formulate a ration should be similarly discounted. **If you are unsure about which energy value to use, select the energy value for 60 lb (27 kg) of milk for large breeds and 40 lb (18 kg) for small breeds.** These values are consistent with the 3X maintenance values historically reported.

The 2001 NRC Dairy feed composition tables list energy values at 3X and 4X maintenance levels. For Holsteins, corresponding predicted energy values from our report are at 60 lb (27 kg) and 90 lb (41 kg) levels, respectively. To obtain the 90 lb level, simply split the difference between the 80 and 100 lb values. For Jersey's, the 3X and 4X levels are at 40 lb (18 kg) and 60 lb (27 kg), respectively.

Incorporated into the new predictive system is a "processing adjustment factor (PAF)" to adjust the availability of the carbohydrate fraction. For example, steam flaking of corn increases the availability of the carbohydrates over regular corn. The digestibility of the NFC fraction of steam flaked corn is multiplied by 1.04 to account for this. The most common feed that will be affected is corn silage. The NFC is discounted by a factor of 0.94
for normal corn and 0.87 for mature corn to reflect the decrease in availability of the NFC as corn kernels mature and harden.

Energy values generated by our current energy prediction system will still appear in their traditional position on the report. You have the option of using the traditional values or the new NRC values.

The NRC energy prediction concept represents the next step forward in energy estimation. We hope that you find this information useful and that it can play a role in improving overall herd performance.

Points to Remember

- The more information fed into the system, the better the energy prediction.
- Providing breed, body weight, fat test and true protein will improve the prediction. In the absence of this information, breed (if known) averages or Holstein averages will be used.
- The predictive scheme requires CP, NDF, ADICP, NDICP, lignin, fat and ash to generate the energy values. Our system requires at least the CP and NDF. In the absence of the other values, average values are plugged into the equations. The more values that are actually analyzed, the better the prediction.
- The energy values are not predictive of performance. Using the 80 lb energy value for cows that are producing 65 lb of milk will not push those cows to 80 lb. Rather, for cows producing 80 lb of milk, the 80 lb energy value is the best estimate of how much energy the cows will actually derive from the feed.
- For Holsteins, use the 120 lb (54 kg) values with <u>extreme</u> caution. Calculation of this value is on the edge of the theoretical limits of the energy prediction scheme.
- For Jersey's, do not use energy values above 80 lb (36 kg) of milk.
- Improper usage of energy values presented in the table could result in high grain feeding levels and the problems generally associated with it.
- For Holsteins, energy values at 3X and 4X maintenance levels are at 60 lb (27 kg) and 90 lb (41 kg), respectively. For Jerseys, the corresponding values are at 40 lb (18 kg) and 60 lb (27 kg).
- Ideally, all feeds used to formulate a ration should be similarly discounted.
- If you are unsure about which energy value to use, select the energy value for 60 lb (27 kg) of milk for large breeds and 40 lb (18 kg) for small breeds.

For more information, see the NRC Nutrient Requirements of Dairy Cattle, 7th revised Edition, 2001. National Academy Press, 2101 Constitution Ave. NW, Washington, D.C. 20418, or at **www.nap.edu**.