

Near Infrared Reflectance Spectroscopy

Near Infrared Reflectance spectroscopy (NIR) is a sophisticated analytical technique for rapidly determining nutrient composition. Utilizing spectral properties of the feed, multiple nutrients are determined simultaneously. First utilized for feed analysis in the late 1970's, its popularity has blossomed over the last 20 years to make it our most popular service. NIR is recognized by the Association of Official Analytical Chemists (AOAC) as an official method of analysis. Continued enhancements to computer hardware and software have contributed to progressive refinements of the technology.

NIR is calibration dependent. Traditionally, calibrations were developed for common feed types by analyzing several hundred to several thousand samples. The chemical information contained in these samples is correlated to spectral properties and a calibration is born. For example, a corn silage calibration is based on samples grown and harvested under varying climatic and geographic conditions. Calibrations built upon several years of information provide the power of being able to accurately analyze samples grown under a wide variety of conditions.

The Dairy One Advantage

Dairy One has over 20 years of experience in NIR analysis. The analysis of hundreds of thousands of samples has enabled us to assemble a large sample database for calibration development. In 2000, we began using the LOCAL calibration software developed by Infracost International. The LOCAL calibration software is a quantum leap forward over traditional calibration development. In the past, global calibrations were built upon several hundred to several thousand analyses of individual samples to generate a single calibration that would be applied to all feeds of a particular type. Today, using the LOCAL technology, a calibration is built for **each** sample as it is analyzed by the instrument. The software searches the database for the sample spectra that most closely resembles the sample currently being analyzed. An individual calibration is then developed for that sample based on "its closest relatives". In the world of calibrations, the more that your calibration (or background) samples match the sample being analyzed, the more accurate the results.

Utilizing this powerful new technology, Dairy One provides the analytical advantage when it comes to analyzing your samples.

NIR Applicability

At Dairy One, NIR can be used to analyze the feed types listed in the accompanying applicability chart. Any sample requesting an NIR package that is not suitable for an NIR analysis, will automatically be given the (11) Ration Balancer package. When considering NIR services, please check the accompanying list to be sure that your samples can receive it.

Please note – an analysis of a TMR by NIR must be performed by one of these two packages - 305 or 306. TMRs may not be run using any of the other NIR services. Likewise, TMRs are the only sample types that can receive these two services. All other feed types must use one of the other NIR packages.

NIR Services

301 \$16.00 **NIR Model** – provides nutrients required by the most common models. Select the appropriate model and the results are printed in sequence required for data entry. The standard option is the default when no other option is selected. DM, CP, SP, RDP, ADICP, NDICP, ADF, NDF, Lignin, fat, ash, starch, sugar (forages only), NFC, NSC, RFV, TDN, NEI, NEm, NEg, ME, DE, Ca, P, Mg, K, and S.

302 \$26.00 **NIR Model with Wet Chemistry Minerals** – same as (301) plus macro and micro minerals Ca, P, Mg, K, Na, Fe, Zn, Cu, Mn, and Mo performed by wet chemistry.

03 \$12.00 **NIR** – DM, CP, SP, ADICP (haylages only), ADF, NDF, NFC, RFV, TDN, NEI, NEm, NEg, ME, DE, Ca, P, Mg, and K.

04 \$21.00 **NIR with Wet Chemistry Minerals** – same as (03) plus macro and micro minerals Ca, P, Mg, K, Na, Fe, Zn, Cu, Mn, and Mo performed by wet chemistry.

305 \$14.00 **NIR TMR Snapshot** – DM, CP, SP, ADF, NDF, Fat, Ash, NFC, TDN, NEI, NEm, NEg.

306 \$23.00 **NIR TMR with Wet Chemistry Minerals** – same as (305) plus macro and micro minerals Ca, P, Mg, K, Na, Fe, Zn, Cu, Mn, and Mo performed by wet chemistry.

309 \$16.00 **NIR Hay Market Profile**: Hay and Haylage only – DM, CP, ADF, NDF, **NDFD48**, **IVTD48**, lignin, **sugar**, NFC, RFV, **RFQ**, **Milk/ton**, TDN, NEI, NEm, NEg, Ca, P.

310 \$16.00 **NIR Corn silage Market Profile**: Corn silage only – DM, CP, ADF, NDF, **NDFD48**, **IVTD48**, lignin, **starch**, NFC, **Milk/ton**, TDN, NEI, NEm, NEg, Ca, P.