

Perten Instruments Application Note

DA 7250 Analysis of Dry Forages

Analysis of Dry Forages using the DA 7250 Analyzer

Introduction

Dried forage is an important feed and it is vital to have nutritional information on grasses, corn silage, hay and other forages.

The Near Infrared Reflectance (NIR) technology is highly suitable for these purposes. Instead of the time consuming and labor intensive traditional wet chemistry methods, with NIR the multi component analysis is done in seconds. The latest Diode Array Technology allows the benefits to be even further exploited not requiring sample grinding or special cups.



DA 7250 NIR Analyzer

The DA 7250 is a proven, full-spectrum NIR instrument designed for use in the grain and feed industry.

Using novel Diode Array technology it performs a multi-component analysis in only 6 seconds. The instrument is handled by an intuitive touch screen interface and samples are measured in flexible open dishes.



As the samples are analyzed in reflectance NIR spectroscopy from above in open dishes, the problems associated with unclean sample cups are avoided and operator influence on results is minimal.

Method

More than 1200 samples of various types of forages from North America, Europe and China were analyzed on multiple DA 7250 units and by wet chemistry methods for moisture, protein, ash, NDF, ADF, crude fiber, fat, calcium and phosphorus contents. The samples included corn silage, alfalfa, grass and hay. Samples were dried and ground and analyzed using open samples dishes on the DA 7250 with one scan in 6 seconds. Samples included moisture contents 2.6 – 19.2% and various particle sizes.



As received

Ground

NIR calibrations were developed using multivariate regression and scatter correcting spectra pre-treatments

Results and Discussion

The calibrated DA 7250 results proved to be very close to the results from the reference methods. Statistics of developed calibrations are presented in the table 1 below and graphs for protein, moisture and crude fiber calibrations are displayed in page 2.

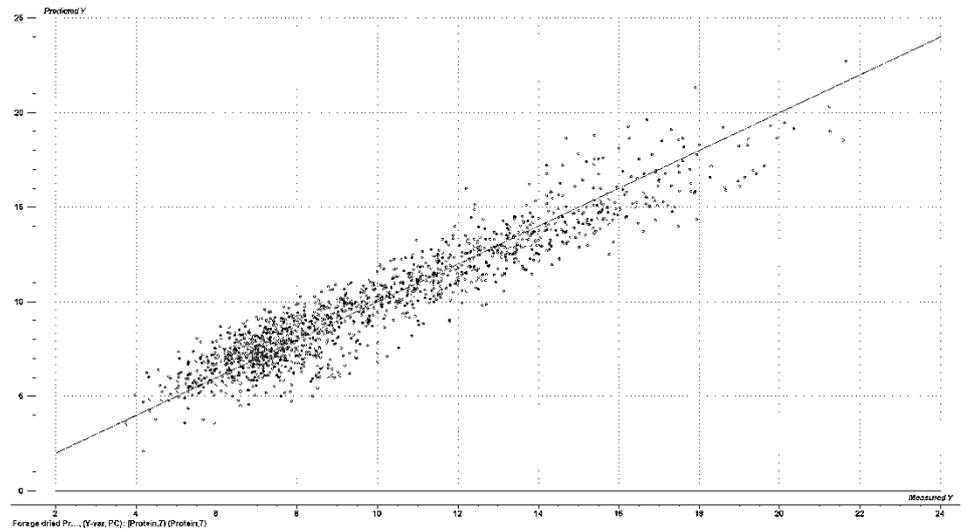
Parameter	Range	Samples	R
Moisture	2.6 - 19.2	1200+	0.95
Protein _{, as is}	3.7 - 21.6	1300+	0.93
Ash _{, as is}	1.3 - 14.2	1100+	0.92
NDF _{, as is}	24.0 - 73.9	300+	0.93
ADF _{, as is}	12.7 - 49.7	300+	0.94
Crude fiber _{, as is}	4.0 - 40.9	700+	0.85
Fat _{, as is}	0.2 - 4.7	400+	0.62
Calcium	0.1 - 0.5	400+	0.66
Phosphorous	0.03 - 0.4	400+	0.85

Table 1

In summary is concluded that the DA 7250 can accurately analyze dry forage in 6 seconds. Enabling accurate results with very easy samples handling and high samples throughput.

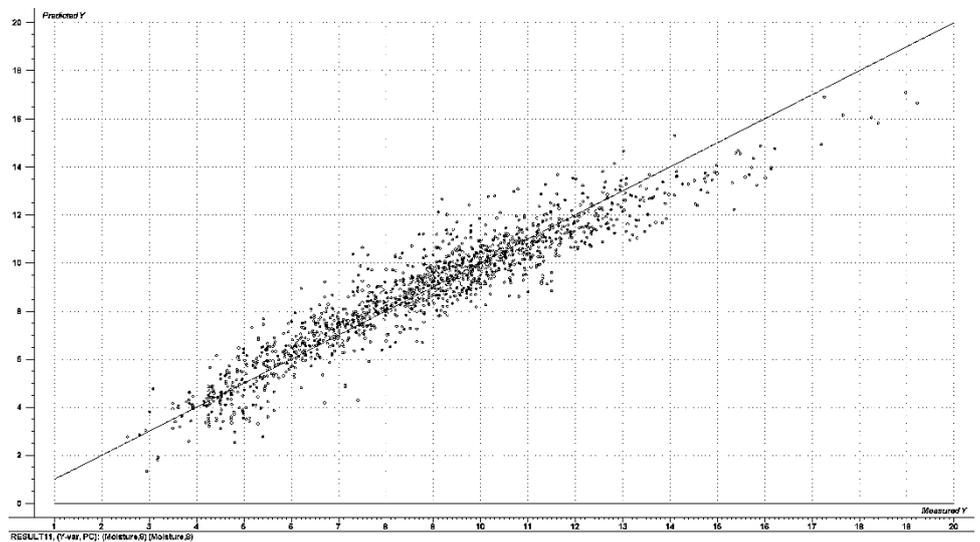
Protein

Protein is determined with a high level of accuracy using combined calibrations including many types of dry forages.



Moisture

The moisture calibration covers a wide range and provides accurate moisture.



Crude fiber

The crude fiber calibration is wide in range and providing accurate results.

