

Analysis of Moisture in Pasta using the Diode Array 7200

Introduction

In pasta production the moisture content is an important control parameter, which influences production costs as well as the quality of the final products.

The Near Infrared Reflectance (NIR) technique is particularly suited for measurement of these parameters, but in the past instrument limitations have not permitted users to reap the full benefits of NIR. Sample preparation requirements such as grinding or special cups made analyses laborious, time consuming and error-prone.



Diode Array 7200

The DA 7200 is a new full-spectrum NIR instrument designed for use in the food industry. Using novel diode array technology it performs a multi-component analysis in only 6 seconds with no sample grinding or sample preparation required.

During this time approximately 300 full spectra are collected and averaged. As the sample is analyzed in an open dish, the problems associated with sample



preparation cups are avoided and operator influence on results is minimal.

Experimental

A total of 167 pasta samples from a Polish pasta producer were analyzed in a DA 7200. The samples encompassed different shapes such as stars, ribbons, nests, needles, pipes, screws etc. Each sample was analyzed with 2 repeats and 2 repacks. The samples were analyzed as received, with no grinding or other sample preparation.

Reference analyses were supplied by the customer. Calibrations were developed by Perten Instruments using Partial Least Squares (PLS) regression. Multiplicative Scattering Correction (MSC) and Savitzky-Golay derivatives were used as data pre-treatment to improve the calibration models.

Results and Discussion

The DA 7200 results are very accurate when compared to the results from the reference methods. Statistics for the respective parameters are presented in the table below and graphs are displayed on page 2.

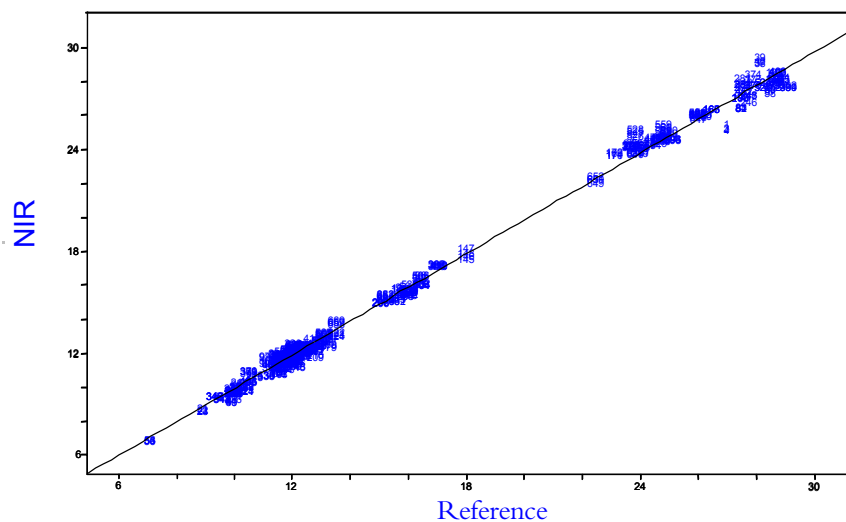
Parameter	Range	Samples	R ²	SECV*
Moisture	7.2-29.2	167	0.996	0.38

The differences between the DA 7200 and the reference method are of the same magnitude as typical differences between two different reference labs. The DA 7200 is more precise than the reference methods meaning that replicate analyses are much more repeatable and representative.

In summary it is concluded that the Diode Array 7200 can analyze moisture in pasta. It should be noted again that these results are for whole pieces of pasta – i.e. no grinding before the analysis.

Moisture

This moisture calibration has an outstanding performance across a very wide moisture range. It is as accurate for fresh pastas as it is for the dried product, and makes the DA 7200 an excellent analytical tool in pasta production.



* SECV is the standard deviation between NIR and Lab data calculated in a way that describes the future performance of the calibration.