

## Analysis of Moisture and Fat in Tortillas

### Introduction

In production of tortillas and other baked products it is vital to be able to monitor and control moisture content, as both product quality and production costs are highly affected.

The Near Infrared Reflectance (NIR) technique is highly suitable for this purpose, but in the past instrument limitations have not permitted users to reap the full benefits of NIR. Sample preparation requirements like grinding or special cups made analyses laborious and time consuming.



### 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 3 seconds with no sample preparation required. During this time 300 full spectra are collected and averaged. As the sample is analyzed in an open dish, the problems associated with



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

### Experimental

Approximately 170 samples from a major US tortilla manufacturer were analyzed in the DA 7200. The tortillas were presented to the analyzer as they were, without any sample preparation, simply placed on the dish. Reference analysis was performed by the tortilla manufacturer.

Calibrations were developed by Perten Instruments using Partial Least Squares (PLS) regression, a method which gives robust and stable calibrations. Multiplicative Scattering Correction was used to improve the calibration models.

### Results and Discussion

The Diode Array 7200 proved to predict results very close to the results from the reference method. Statistics are presented in the table below and a graph is displayed in page 2.

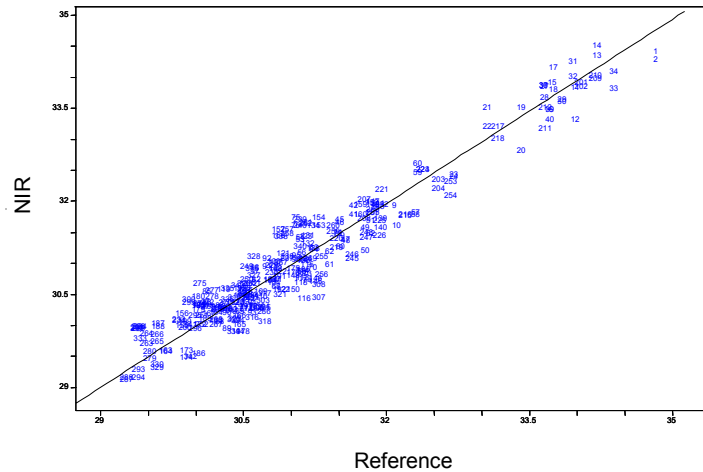
Parameter	Range	Samples	R <sup>2</sup>	SECV <sup>*</sup>
Moisture	29.3-34.8	153	0.94	0.31
Fat	8.3-10.4	140	0.55	0.32

The differences between the DA 7200 and the reference method are of the same magnitude as the typical differences between two reference labs.

In summary it can be concluded that the Diode Array 7200 can determine moisture and fat in tortillas with excellent results. The tortillas can be analyzed as they are, with no sample preparation prior to analysis.

### Moisture

Moisture is predicted with a very high accuracy and it is clear that the DA 7200 can be used for monitoring of moisture levels in tortillas.



### Fat

The graph for fat does not look as nice as the one for moisture, but analytical accuracy is actually the same. The samples had a much more narrow range for fat, and for this reason the correlation is lower. The NIR error is still of the same magnitude as the error of the reference method.

