

Analysis of Pol and Conductivity in Sugar Beet Brei using the DA 7250 NIR

Introduction

For sugar beet processors it is important to be able to rapidly and accurately determine the quality of sugar beets when delivered to the factory. Pol and conductivity are two key parameters as they determine the economic value and thus the price of the sugar beets.



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. Requirements like special cups, difficult sample presentation, and extensive cleaning between samples made analyses laborious and time consuming.

DA 7250 NIR Analyzer

The DA 7250 is a proven, full-spectrum NIR instrument designed for use in the food and agricultural industries. Using novel diode array technology it performs a multi-component analysis in only 6 seconds.

During this time a large number of full spectra are collected and averaged. As the sample is analyzed in an open dish, the problems associated with sample cups are avoided and cleaning between samples is minimal.



Experimental

More than 11,000 brei samples from North American sugar beet processors were analyzed in the DA 7250 NIR instrument. The samples were analyzed as they were, after being stirred briefly. Reference method analysis was performed by the tare labs at the sugar beet processing plants.

Calibrations were developed by Perten Instruments using Honigs Regression, a proprietary regression technique developed by Perten Instruments. Honigs Regression makes it possible to develop calibrations for large, diverse sample sets without loss of performance.

Results and discussion

The DA 7250 proved to predict results very close to the results from the reference methods. Statistics are presented in the table below and graphs are displayed in page 2.

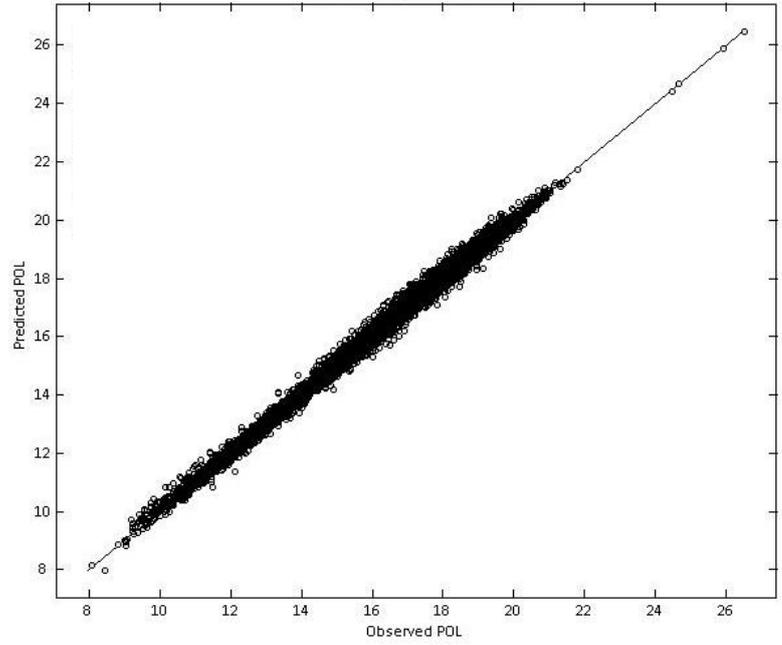
Parameter	Range (%)	Samples	R
Pol	8.1 – 26.8	11000+	0.998
Conductivity	26.5 – 52.8	11000+	0.933

The differences between the DA 7250 and the reference methods are of the same magnitude as typical differences between two different reference labs. The DA 7250 is more precise than the reference methods meaning that replicate analyses are much more repeatable and representative.

In summary, it can be concluded that the DA 7250 can determine pol and conductivity, with similar accuracies as the reference methods.

Pol

The Pol results are very accurate across the range. DA 7250 will be an excellent tool for rapid and accurate determination of Pol in sugar beet brei.

**Conductivity**

The DA 7250 correlates very well to the reference method for conductivity and provides a rapid way to test sugar beet brei for conductivity.

