

Application Note

Keywords

- Soybean sorting
- Protein content

Techniques

- NIR reflectance spectroscopy
- Chemometric analysis

Applications

- Soybean analysis
- Process monitoring
- Quality validation

Measuring Protein in Soybeans

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Challenge

Rapid measurements of protein content are needed for high-throughput sorting of soybeans at harvest, and for cost-efficient process feedback during soybean meal production.

Solution

NIR reflectance measurements offer the speed and accuracy to measure protein at both points in the supply chain, enabled by chemometric analysis and automation.

Soybeans are valued for their oil and as a source of protein-rich meal for animal feeds. The protein content of soybeans is heavily dependent on the nitrogen content of the soil in which they are grown, and also on farming methods. During the soybean harvest, a high volume of soybeans must be sorted by protein level in a short period of time. While traditional analytical methods cannot keep up, NIR reflectance spectroscopy has emerged to provide high-throughput, automated analysis in the form of easy to use instruments offering clean operation in a small footprint.

Soybeans fed continuously through the InLAB NIR 512 system from TecnoCientifica pass by a window, through which reflection measurements are made by a NIRQuest512 spectrometer (900-1700 nm). The spectra undergo PLS multi-parameter chemometric analysis to yield the

protein level, with excellent agreement between predicted and measured values.

Also, the same system can be used for online process monitoring of soy meal and oil production. Effective monitoring ensures extraction of the maximum oil content while still meeting requirements for water, protein and residual oil content in the soybean meal. While up to tens of thousands of dollars can be lost per hour in delayed feedback from conventional or even “rapid” onsite lab testing, online NIR spectroscopy allows instant, continual process optimization and quality validation. 🌱

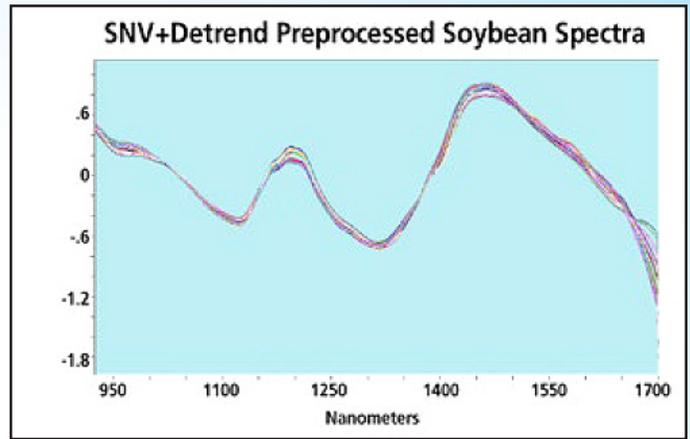


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