



The symphony of vibrations in NIR spectroscopy combined with chemometrics: *a powerful cocktail*

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A few decades ago NIR spectroscopy was not considered as a useful analytical technique in the academic world since the interpretation of the NIR spectra was nearly impossible. Today NIR spectroscopic measurements have revolutionized quality control in practically all areas of food, agricultural and pharmaceutical production. Near-infrared spectroscopy has been implemented for monitoring the quality of millions of samples of cereals, vegetables, milk, meat, powders and tablets with unprecedented precision and speed. The key to this success is the extraordinary synergy that lies in the merging of NIR spectroscopy with the data technology called chemometrics. The combination of chemometrics and NIR spectroscopy is a most powerful cocktail which is non-destructive and of observing nature, and thus allow for a new level of inductive research which in turn has led to a paradigm shift in the industry as well as in academia. Seen from a physical, chemical, and biological perspective, food systems are complex multifactorial systems containing mixtures of heterogeneous chemical mixtures of heterogeneous classes of molecules as well as complex physical structures such as amorphous solids, aqueous solutions, gels, macromolecules, macro-organelles, cells, crystals, pores, and cavities. Food systems are thus the perfect playground for developing new NIR and chemometric methods.

This presentation will try to explain why NIR spectroscopy has become an unbeatable analytical method by giving examples that exploit some of the unique features of NIR and examples that may indicate where we are heading with NIR spectroscopy.
