

Quantitative control of flavour delivery systems A comparative chemometric and spectroscopic investigation by NIR and NMR

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The encapsulation of flavours offers many technical advantages. The principal ones being: the delivery of a liquid flavour in a free-flowing powder form, the protection of sensitive flavour molecules from oxygen, controlling flavour release and the minimisation of the interaction between the flavour and the food base.

Flavour encapsulation is performed using a variety of processes at industrial scales. The reliable and rapid determination of the flavour and water contents is an essential task in controlling the quality of encapsulated flavour products quality.

The composition of encapsulated systems, which consist of a carrier (usually a carbohydrate based glassy solid), a flavour (usually a liquid) and water, lend itself to analysis using spectroscopic techniques, such as Near-Infrared (NIR) and Low-field Nuclear Magnetic Resonance (LF-NMR).

This poster represents a comparative spectroscopic/chemometric investigation of the quantitative performance of NIR and LF-NMR for prediction of oil, water and total liquid contents in two encapsulated flavour delivery systems – limonene and 2,5-dimethylpyrazine.

The computation of NIR spectra resulted in chemometric models with reasonable predictive ability. The computation of NMR spectra is shown to be successful only for the limonene model systems – prediction models which performance is better when compared with the models obtained when NIR data are computed.

In conclusion, NIR and NMR should be regarded as complementary rather than competitive spectroscopic techniques. The successful application of both techniques depends on the nature of the samples under study.

References:

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