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The use of raman spectroscopy in the animal feed sector

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Abstract As part of the EU FP7 project, Quality and Safety of Feeds and Food for Europe (QSAFFE), there are assessments being made on various “fingerprinting” methodologies with regards to determining conformity and geographical origin of imported commodities. One such technique that is being evaluated is Raman Spectroscopy. Raman, which arises from the inelastic scattering of light, is a non-destructive technique that is becoming increasingly popular as a research tool in the food and feed sectors.



Within Work Package 1 of QSAFFE, the possibility that oils used in the feed industry could be adulterated is being investigated. Waste oils, such as transformer oils/mineral oils, are of interest and it is possible that they could contain dioxins/polychlorinated biphenyls (PCBs). Oils used in the feed industry, such as soya oil and basic vegetable blend oil, were adulterated with up to 25% mineral oil/transformer oil, raman spectra of the mixtures were run and chemometric analysis applied to the samples. Qualitative and quantitative chemometric models will be presented.

Within Work Package 2 of QSAFFE, the botanical and geographical origins of commodities are being investigated. Distillers dried grains with solubles (DDGS), a by-product of ethanol biofuel and beverage production where the process is focused on the ethanol yield, were highlighted as an emerging feed ingredient. In a crisis related to this commodity, it would be beneficial to prove the country of origin of the DDGS. Raman spectra of DDGS are affected to a large degree by fluorescence which masks any of the signals from raman scattering. However, to overcome this, the oil fraction of the DDGS was extracted using accelerated solvent extraction (ASE), raman spectra were run and chemometric analysis applied to the data and qualitative calibration models were constructed. These initial models will be presented.

Keywords Raman spectroscopy;feed oils;distillers dried grains;adulteration;country of origin;qsaaffe

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