

Abstract

Proof of concept of spectroscopic markers for the discrimination of animal meals in feedingstuffs

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Introduction

One of the main measures taken by the European Commission against the spread of bovine spongiform encephalopathy (BSE), was the introduction of a total ban on the use of processed animal proteins (PAPs) for any animal farmed for the production of food. The availability of robust methods for the species-specific detection of meat and bone meal in compound feeding-stuffs is an important prerequisite to enforce the current European legislation on the use of PAPs in animal nutrition. Near Infrared (NIR) Microscopy has been demonstrated to be a powerful tool for the detection of banned MBM in feed, giving results equivalent to the official European method (classical microscopy). Moreover, a NIR microscopy method has been successfully transferred to two further independent laboratories, thus demonstrating the ruggedness of the method and is being transferred to the NIR imaging technique in the frame of the SAFEED-PAP project.

Materials and methods

NIR microscopy analysis was performed using an auto-image NIR microscope from Perkin-Elmer. Spectra of samples particles were collected in both reflection modes over the range of 1100–2500 nm. NIR imaging analyses were performed using the MatrixNIR hyperspectral imager from Malvern. Particle sample spectra in the 900–1700 nm range were acquired in the reflection mode.

Results and discussion

A study conducted in the frame of SAFEED-PAP revealed specific wavelengths (i.e. markers) suitable for the discrimination between terrestrial animal meals and fishmeals. The interpretation of the specific wavelengths hinted at the composition of the fat portion in the animal meals as the main factor responsible for the separation. The verification of the existence of a marker is required to demonstrate that the identification of animal meals by means of NIR spectroscopy is based on sound scientific reasoning. Therefore, proof of concept experiments were designed in order to evaluate the impact of fat composition on the discrimination of the two classes (terrestrial vs fish) demonstrating that even though fat is highly contributing to it, other bands could have a key role in the discrimination.