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Proof of Concept of Spectroscopic Markers for the Discrimination of Animal Meals in Feedingstuffs

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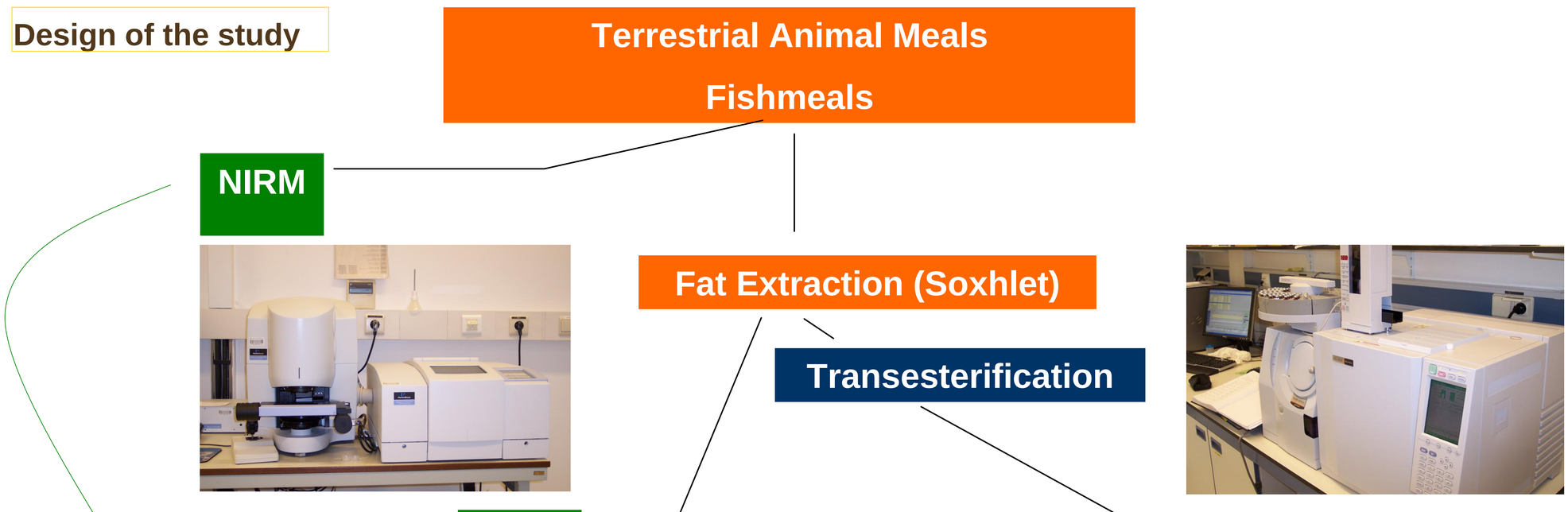
Introduction

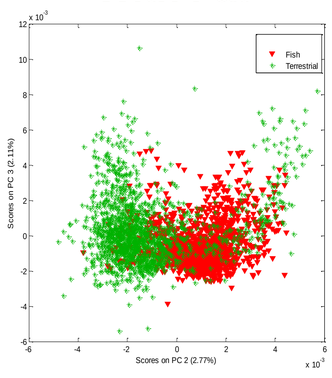
One of the main measures taken by the European Commission against the spread of bovine spongiform encephalopathy (BSE) was the introduction of a total ban on the use of processed animal proteins (PAPs) for any animal farmed for the production of food. A species-specific method for the detection of PAPs is a prerequisite.

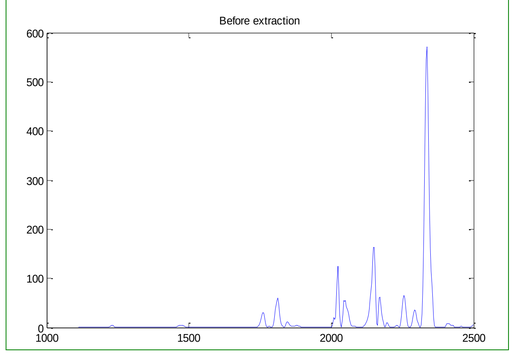
Experiments were performed to investigate spectroscopic markers leading to discrimination between NIR spectra, obtained using a NIR microscope (NIRM), of fish meals and terrestrial animal meals. The fatty acid profiles were investigated.

Design of the study

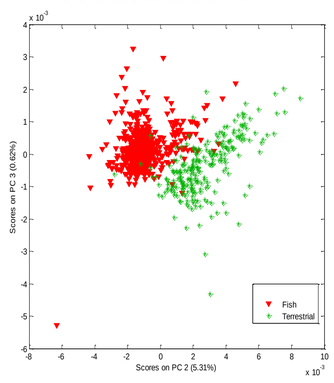


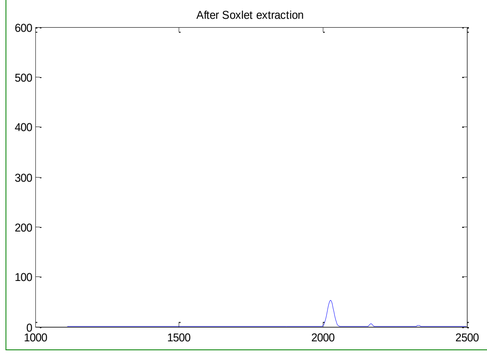
With Fat





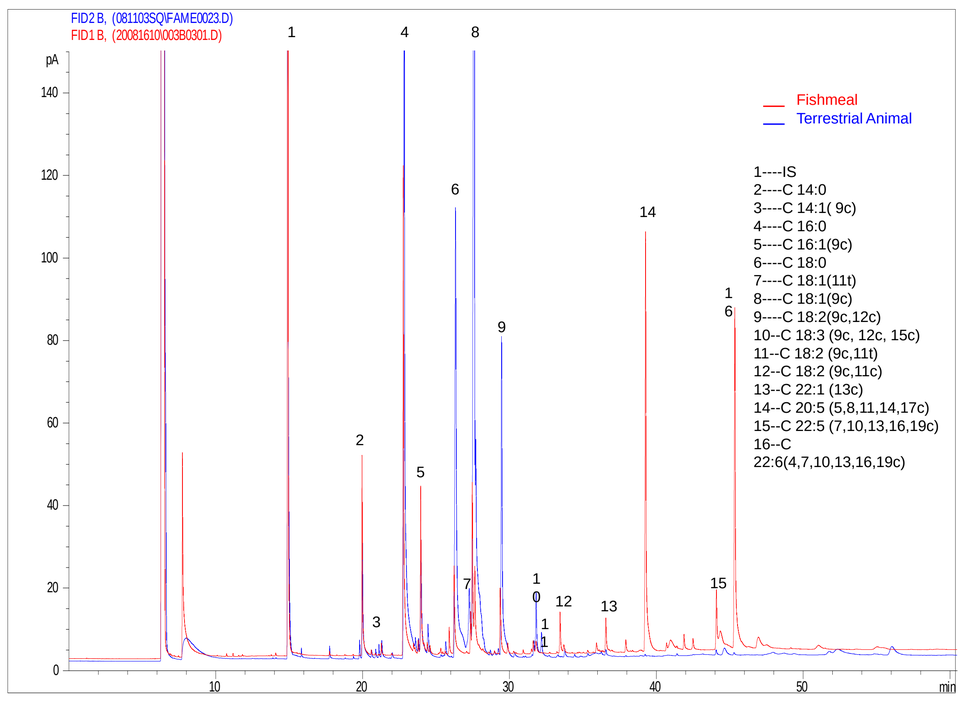
Without Fat





Plots showing the PCA and Fisher Test results for terrestrial and fish meal samples

Fatty Acid Profile



Typical GC-FID chromatogram from a fish meal sample (red) and a terrestrial animal meal (blue)

Conclusions

A new approach based on the combination of NIRM and GC analysis has been applied for the chemical interpretation of the NIR markers. GC analysis demonstrated the different fatty acid profile of terrestrial animal meals and fish meals that highly contributes to the discrimination of the two classes, although PCA analysis of the spectra indicates that fat has a minor effect on this discrimination. This needs to be further evaluated as well as the band in the O-H band.

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