P.35- External validation of NIRS models developed in the framework of the STRATFEED European project to predict the percentage of animal origin meals in compound feeds

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The main goal of this work is to demonstrate how NIRS technology may respond to the need of methodologies that allow the detection and quantification of the illegal addition of animal origin meals to compound feedingstuffs.

Different NIRS prediction models have been developed in the framework of the STRATFEED project (European Project nº G6RD-2000-CT-00414), using different strategies with regard to the calibration sets, reference data and chemometric algorithms used.

Two strategies are validated together, one quantitative and other qualitative. For quantification, i.e. for predicting the inclusion percentage of animal origin meals in compound feed specimens, the calibration evaluated in this work (SECV=0.86; r^2=0.98) was obtained using as calibration set a combined set of "real process" compound feed samples (supplied by several feed manufacturers) and experimental compound feeds (prepared at labortatory). For the qualitative approach, i.e. for detecting presence/absence of animal origin meals in compound feed specimens, the models developed (SECV=0.33; r^2=0.54) used the same training set described. All these samples were analysed **ground.** Moreover, in parallel, the "real process" compound feed samples were also scanned **unground**, and new chemometric models with this sample presentation mode were performed for the detection (SECV=0.19; r^2=0.86) and the quantification (SECV=0.80; r^2=0.98) of meat meal.

The validation of the prediction models obtained were carried out using a set of 28 commercial compound feeds declared as free of animal origin meals. These samples were scanned ground and unground. Although the calibrations obtained with ground material classified most of the validation samples as free, nevertheless there were seven samples predicted as adulterated with meat meals. The prediction models performed with unground material showed better classification results. Thus, for the qualitative approach, only three samples are classify as positive in meat meal presence. Moreover, to clarify if other ingredients of animal origin could interfere and distort the results for these misclassified specimens, the inclusion percentage of fish meal, poultry meal, animal fat and whey were predicted using NIR calibrations obtained in a previous research project. The results indicated that samples predicted with high levels of fish meal and whey were correctly classified as free of meat meals; while samples with presence of fat were identified as false positive in meat meal.

Keywords

NIRS, validation, compound feed, animal origin meal, quantification, detection, adulteration, unground analysis