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Synchronous fluorescence spectroscopy for detecting blood meal and blood products

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Abstract

Fluorescence spectroscopy is a powerful method for protein analysis. Its sensitivity and selectivity allow its use for the detection of blood meal and blood products. This study proposes a novel approach for the detection of hemoglobin in animal feed by synchronous fluorescence spectroscopy (SFS). The objective was to develop a fast and easy method to detect hemoglobin powder and blood meal.

Analyses were carried out on standard reference material (hemoglobin and albumin) in order to optimize SFS method conditions for hemoglobin detection. The method was then applied to protein extracts of commercial feed material and compound feed. The results showed that SFS spectra of blood meal and blood products (hemoglobin powder and plasma powder) could be used to characterize hemoglobin. Principal component analysis (PCA) applied to area-normalized SFS spectra of artificially adulterated samples made it possible to define a limit of detection of hemoglobin powder or blood meal of 0.5 to 1 % depending on the feed material. The projection in the PCA graphs of SFS spectra of real commercial compound feeds known to contain or to be free from blood-derived products showed that it was possible to discriminate samples according to the presence of hemoglobin.

These results confirmed that SFS is a promising screening method for the detection of hemoglobin in animal feed.

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