Blood meal and blood products detection using Synchronous fluorescence spectroscopy

Introduction

Context: The use of animal by-products (including processed animal proteins, PAPs) depends on their nature defined by the cell type and the species of origin. Currently, their detection is based on two methods: light microscopy and PCR. Complementary methods are needed to be developed in order to refine the by-products identification.

Objective: The aim of this work[1] was to develop a fast and easy method to detect blood meal and blood products. This study was based on the detection of hemoglobin in animal feed by synchronous fluorescence spectroscopy (SFS).

Materials & Method

1. Optimization of the SFS conditions on reference materials:
   - Hemoglobin powder
   - Albumin powder

2. Validation on feed materials (protein extracts*):
   - Hemoglobin powder (n = 8)
   - Blood meal (n = 3)
   - Plasma powder (n = 2)

3. Screening on commercial feed (protein extracts*):
   - Feed with plasma powder
   - Feed with hemoglobin powder / blood meal
   - Feed without any blood derived products

Results

1. Optimization of the SFS conditions on reference materials:
   - Wavelength range: 300 - 600 nm
   - Excitation/Emission slits: 5.5 nm / 6 nm
   - Hemoglobin concentration: 3 µM
   - Offset: 17 nm
   - Solvent: DIGE Labelling Buffer (DLA)

2. Validation on feed materials (protein extracts*):

3. Screening on commercial feed (protein extracts*):

Conclusion et perspectives

Theses results confirmed that SFS is a promising screening method for the detection of hemoglobin in animal feed. Moreover, the method could also be used to evaluate hemoglobin extraction yield in support to other analytical methods.

References
