

Lecrenier M.C.^{1,4}, Marbaix H.², Veys P.¹, Dieu M.², Raes M.², Delahaut P.³, Fumière O.¹, Berben G.¹, Saegerman C.⁴, Baeten V.¹
¹Food and Feed Quality Unit of Agricultural Product Valorisation Department - CRA-W, Belgium. m.lecrenier@cra.wallonie.be;
²Laboratory of Cellular Biochemistry and Biology (URBC), University of Namur, Belgium; ³Health Department - CER Groupe, Belgium;
⁴Research Unit of Epidemiology and Risk Analysis applied to Veterinary Science (UREAR-ULg) – University of Liège, Belgium.

Introduction

Context: The use of animal **by-products in feedingstuffs** depends on their nature defined by the **cell type** and the **species of origin** e.g. In feed intended for non-ruminants, milk powder and porcine blood products are authorised while bovine blood products are prohibited. Currently, the detection of unauthorised ingredients is based on light microscopy and Polymerase Chain Reaction (PCR) methods. Nevertheless, some cases require additional analyses to determine the by-products nature.

Objective: Even if the DNA content of some by-products is similar, they could be distinguished on a protein content basis. The objective of this study is the identification of **specific peptide biomarkers** using **tandem mass spectrometry** for the detection of **bovine blood products** in animal feed.

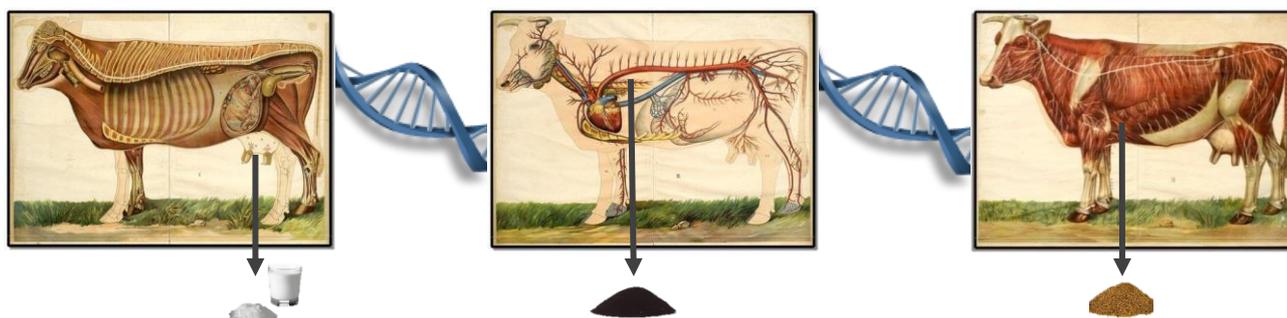


Figure 1: Various by-products derived from ruminants are indistinguishable by PCR analysis

Materials and Method

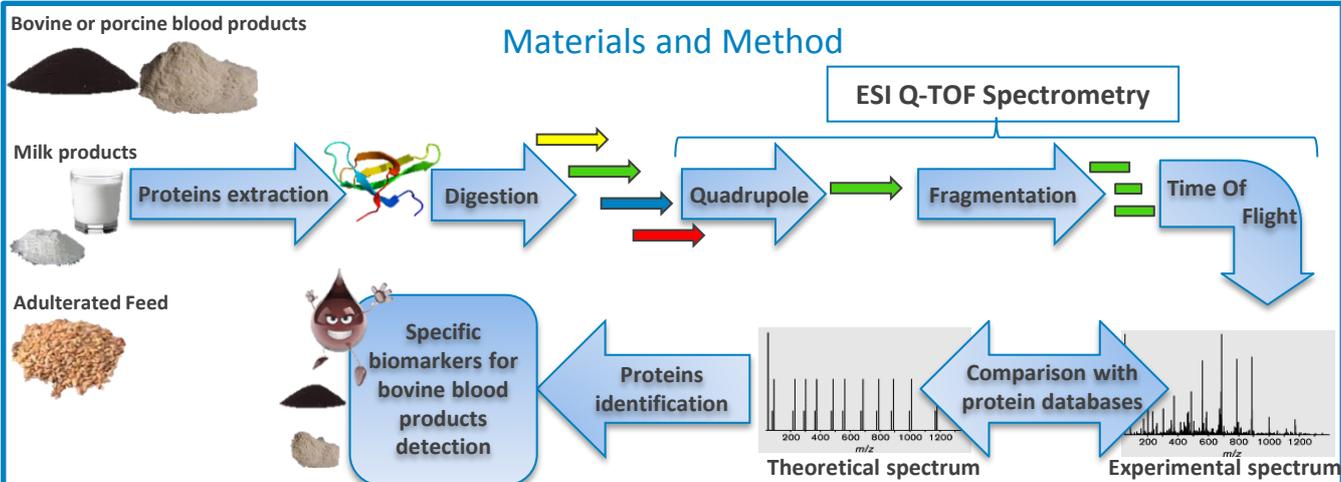


Figure 2: Tandem mass-spectrometry for the selection of bovine blood products biomarkers

Results

Two proteins of interest were highlighted: **Fibrinogen** (α , β and γ chains) and **Hemopexin**. From these proteins, **11 peptide sequences** of 10-20 amino acids in length were selected as being present in bovine blood products and in adulterated feed and absent in the other meals.

Discussion

The results already obtained are promising. Efforts are now focused to increase the blood products and blood meal database and to evaluate the protocol on several matrices. The biomarkers list will then be accordingly updated.

