

DETERMINATION OF RESIDUAL BLOOD CONTENT FLUCTUATIONS OF PORK IN EMULSION-TYPE SAUSAGES USING UPLC-MS/MS

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INTRODUCTION

The use of blood plasma in meat products has many technological advantages. Due to high protein content of 70 – 95% in plasma powder, a substitution of meat by plasma in meat products is conceivable, but needs to be declared. Therefore, it is necessary to develop analytical methods for detection of blood plasma in meat products. Due to the residual blood content in meat, the meat itself and the products manufactured from it contain a certain amount of blood plasma. Thus, it is necessary to investigate the natural fluctuation of the residual blood content of pork in emulsion-type sausages.

RESULTS

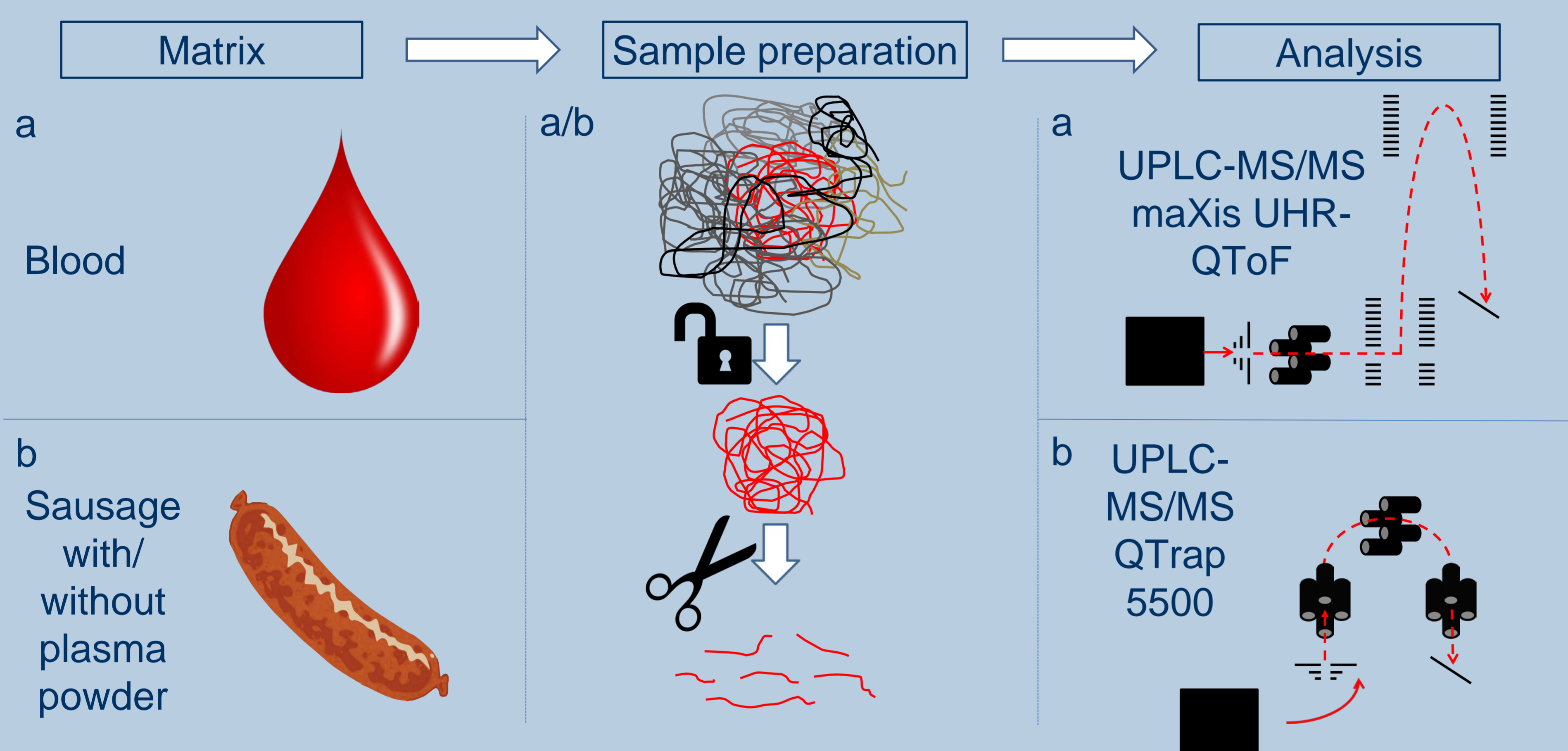


Figure 1: Schematic sequence a) of the peptide analysis of proteins in blood; b) Determination of blood proteins in emulsion-type sausage

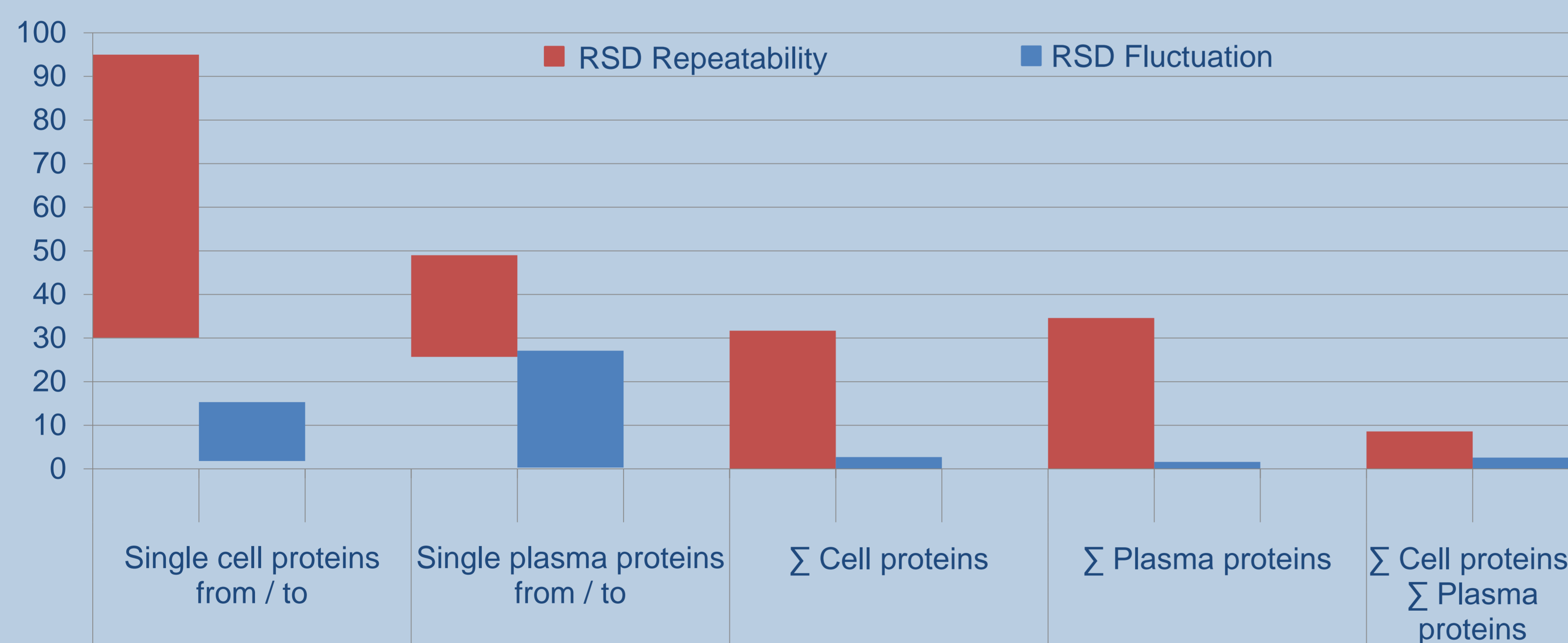


Figure 2: Relative standard deviations (RSDs) of peak areas of blood protein marker peptides analyzing sausages containing pork of different animals (n=7) (red) and analyzing the same sausages (n=3) (blue)

MATERIAL

- 7 individual emulsion-type sausages (full-canned samples) containing pork of only one animal each for fluctuation measurements (50% meat, 24% back fat, 24% ice, 1.8% nitrite curing salt, 0.2% phosphate).
- 1 batch of emulsion-type sausages (full-canned samples) spiked with plasma powder for repeatability measurements (49% meat, 1% plasma powder, 24% back fat, 24% ice, 1.8% nitrite curing salt, 0.2% phosphate).

CONCLUSION

For the further development of liquid chromatography - mass spectrometry methods for the proof of the addition of porcine plasma to meat products, it is recommended to use the ratio of blood cell protein peptides and blood plasma protein peptides.

- Signal-to-noise (S/N) ratio of at least 3
- Determination of blood proteins in sausage
- 6 blood cell and 14 plasma marker peptides with 3 mass transitions each

- Σ cell and plasma peptides
- Ratio of Σ cell peptides / Σ plasma peptides
- Relative standard deviation (RSD)
 - Cell & plasma peptides
 - Σ cell & Σ plasma peptides
 - Σ cell peptides / Σ plasma peptides

Interpretation

- RSD significantly higher for fluctuation measurements (Figure 2)
- Ratio of Σ cell peptides / Σ plasma peptides shows the lowest overall variation