

Extraction of proteins from slaughterhouse side streams

– new functional ingredients

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INTRODUCTION

Side streams from the meat industry are a potential source of high-quality proteins for human consumption. However, some side streams e.g. lungs, heart and spleen are not desirable for human consumption per se, and technical solutions for processing of such animal side streams are needed for better utilization and upscaling of their proteins.

One solution for better utilization is extraction of the proteins. When extracting proteins from a solid matrix, the first step is to solubilize the intracellular material. This can be done chemically, physically or biologically. Until now, the Danish meat industry has primarily attempted to upgrade the side streams through hydrolysis. During production of hydrolysates, the proteins lose their functionality, and bitter peptides are often formed, which is not favourable for further application.

It is important to maintain the functionality of the proteins in order to utilize these proteins as emulsifying or gelling agents in meat processing.

AIM

To develop a gentle extraction method (without elevated temperatures) for protein extraction from a solid slaughterhouse side stream matrix.

CONCLUSIONS

Alkaline extraction is a gentle method for extracting proteins from a solid matrix such as porcine side streams. Increasing pH results in an increased extraction yield, and no bitter taste was perceived when adding 1% protein to mashed potatoes.

RESULTS

Different cold extraction methods were evaluated in a screening trial. Alkaline extraction showed the greatest potential compared to different salt extractions (NaCl and KCl) and solvent extraction (isopropanol).

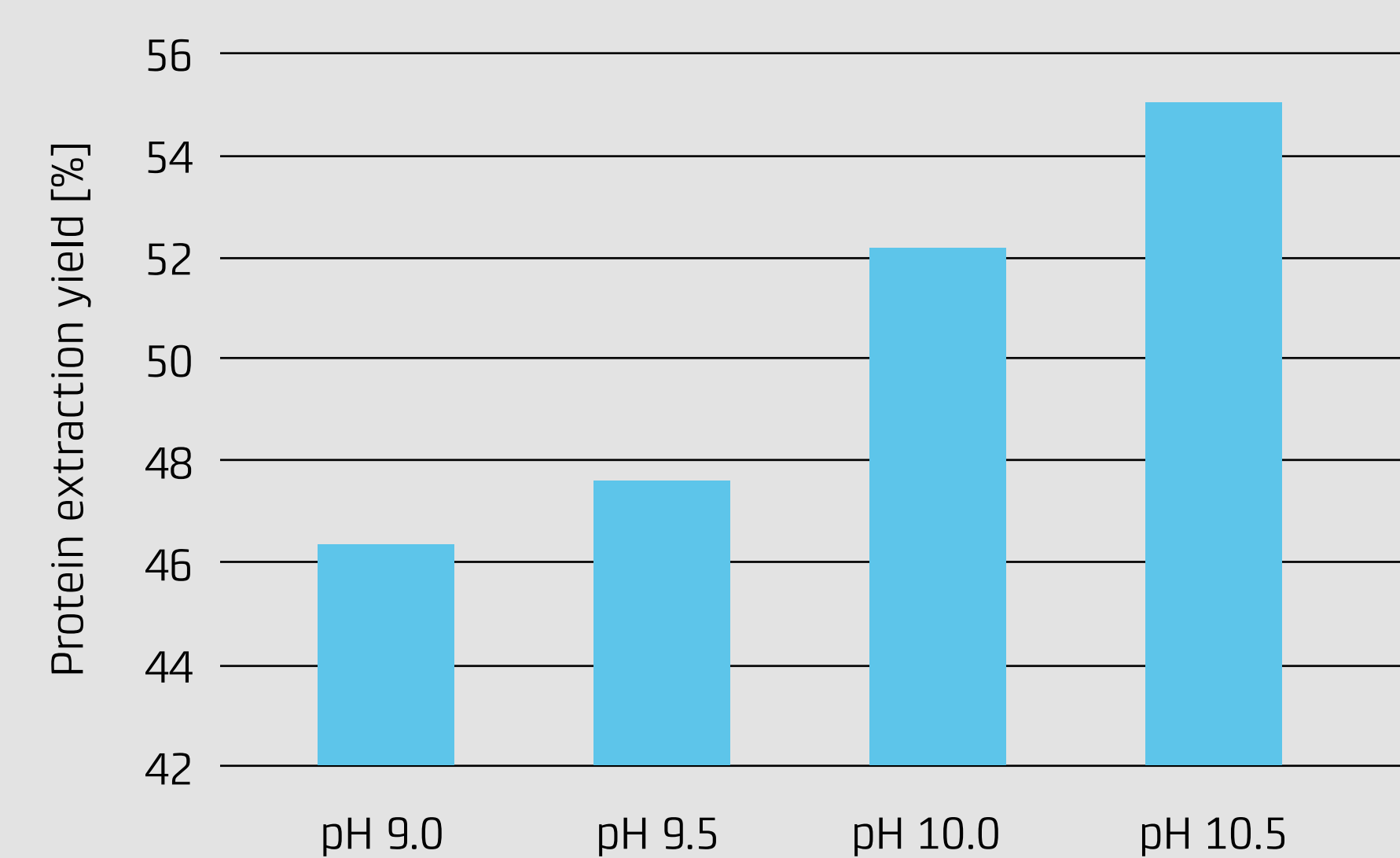
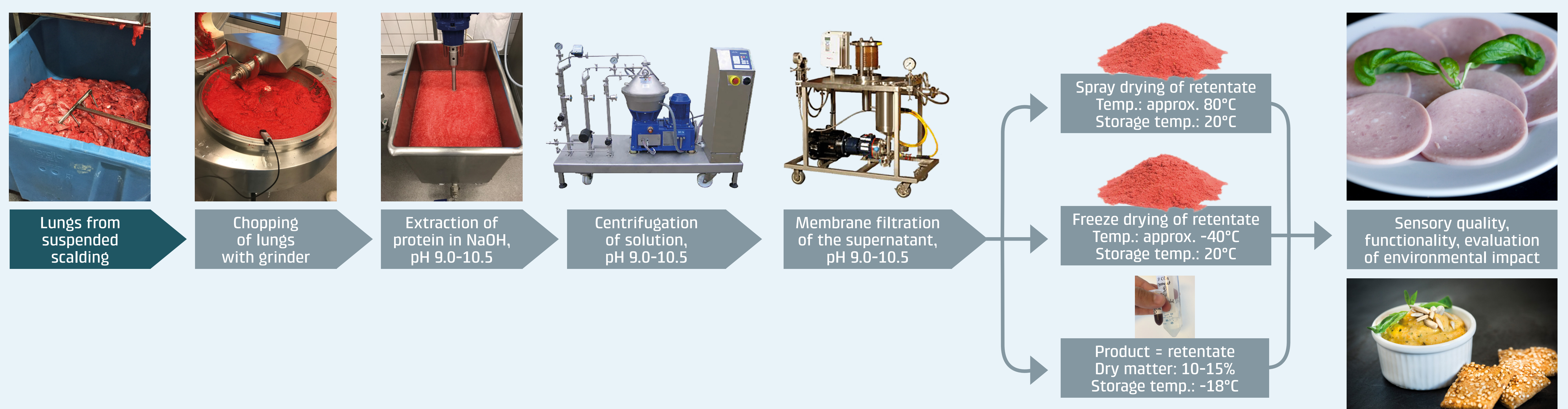


Figure 1: Protein extraction yield with pH varying from 9.0 to 10.5. Extraction was performed at 3°C for 1 hour.

A positive correlation between pH and the extraction yield was found, with a higher pH resulting in a higher extraction yield. The sensory assessment indicated no significant difference in taste and smell by addition of 1% protein to mashed potatoes, though the addition of 1.75% protein reduced the taste of potato and butter while increasing the bitterness and other off-flavours. Addition of protein increased the firmness of the texture, indicating functionality of the extracted proteins. No significant differences were observed by changing the pH during the extraction of the proteins.



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ACKNOWLEDGEMENT: This project is supported by the Danish Agency for Institutions and Educational Grants and the Danish Pig Levy Fund.

