



PERFORMASE®



Ref 0 1 2 3 4 5 24 hours

PROTEASE A+B



Ref 0 1 2 3 4 5 hours

A method for upgrading porcine blood into a decolourized and tasteful protein ingredient

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INTRODUCTION

Porcine blood from Danish abattoirs has mainly been used for animal feed of mink, before the COVID-19 outbreak led to a total lockdown. If the great nutritional and economic potential of blood protein is to be exploited, the blood proteins should be upgraded for human nutrition.

AIM

The aim of this study is to develop an enzymatic method to produce a decolourized and tasteful porcine blood protein ingredient, suitable for upscaling.

RESULTS

Experiment 1

- The DH% increased for both enzymes as the treatment time increased.
- The sensory evaluation indicated an acceptable degree of off-flavour after 4 hours' treatment for both enzymes.

Experiment 2

- DD%-values >96% were obtained after 1 hour for papain, and after 3 hours for Protease A+B.
- A satisfying colour along with a recovery of ≥ 55% was obtained after 4 hours for Performase® and after 3 hours for Protease A+B.
- Size exclusion chromatography showed a decreasing amount of large protein and an increasing amount of smaller peptides during hydrolysis (data for Performase® not shown). Next step is to remove the bitter fraction before upscaling the process.

METHODS & MATERIALS

Enzymatic hydrolysis of red blood cells (RBC) was done using Performase® (papain) and "Protease A+B" derived from *Aspergillus niger*. RBC was diluted 1:4 (w/w), temperature and pH were adjusted, and an enzyme substrate conc. of 0.35% (w/w) for papain and 0.25% (w/w) for Protease A+B was added. Stirring (200 rpm/min) was applied for 1, 2, 3, 4 and 5 h during hydrolysis and stopped by heating to 80°C for 15 min. The samples were adjusted to pH 5.0 ± 0.1 and centrifuged at 7000 g for 45 min. Size exclusion was performed on a Agilent AdvanceBio SEC 130Å, 2.7 µm, 4.6 x 300 mm column.

CONCLUSION

This study showed potential for upscaling the method as a "window of success" for enzymatic hydrolysis of porcine blood was identified.

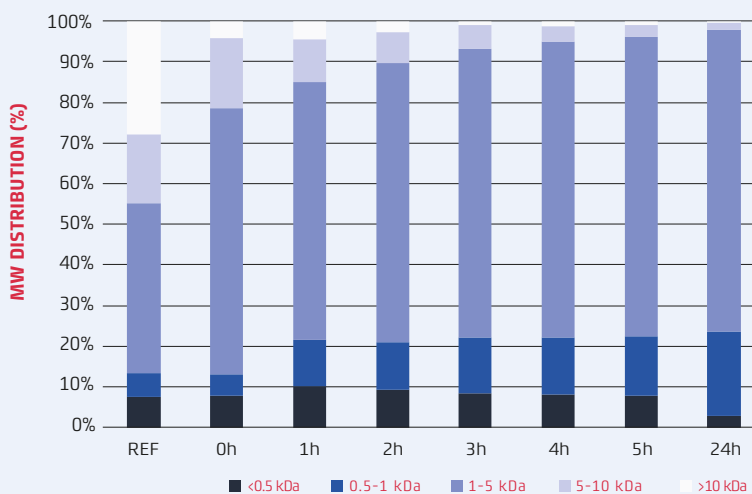


Figure 1. Size exclusion chromatography for Protease A+B (data for Performase® not shown)

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