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# A method for upgrading porcine blood into a decolourized and tasty 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 tasty 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 an 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.

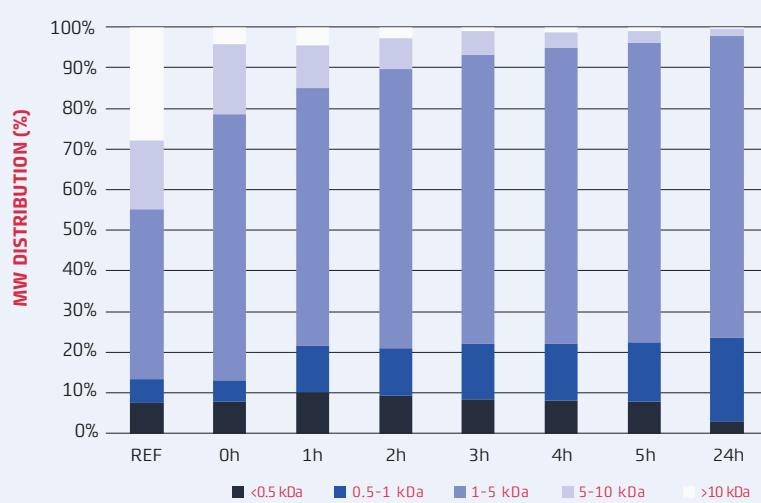


Figure 1. Size exclusion chromatography for Protease A+B (data for Performase® not shown)

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**ACKNOWLEDGEMENT**

This study was supported by the Danish Pig Levy Fund and by a grant from the Danish Agency for Higher Education and Science.

