

Green lentil flour protein as a new protein source to identify novel bioactive peptides

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Introduction

Peptides with biological activities are known as bioactive peptides. They are a promising way to treat several chronic illnesses and conditions. They can be used to make functional foods and nutraceuticals.



New food-grade protein sources and protocols are crucial to find novel bio-active peptides.

Green lentil flour as a new protein source

Green lentils are a good source of protein, nevertheless some seeds are discarded because they don't comply with the market standard. To prevent this waste, this discarded lentils are milled to make flour, and therefore used as protein source for bioactive peptides. We can extract 68% of the protein content from green lentils flour with a food-grade extraction protocol.

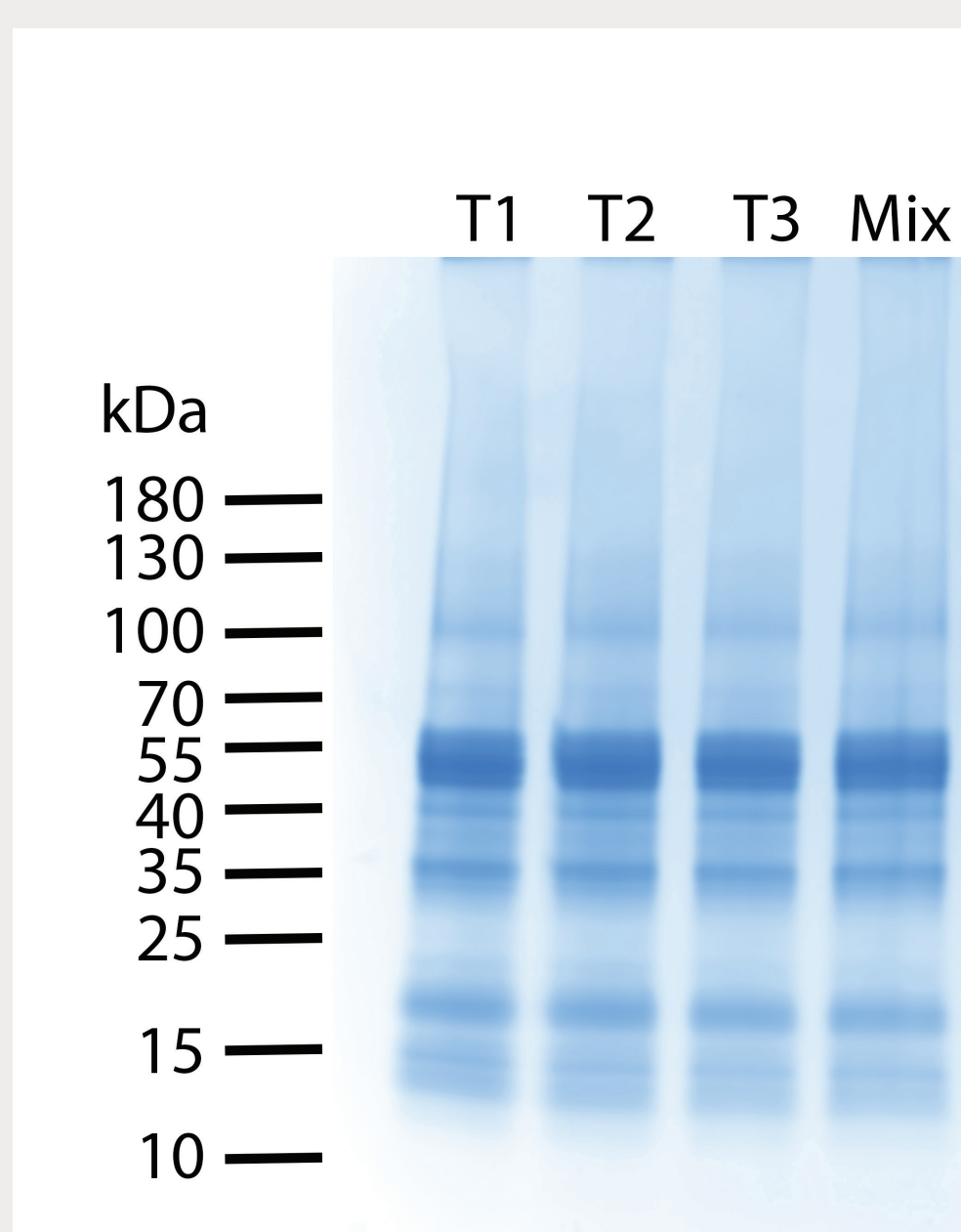


Figure 1: SDS-PAGE of protein extractions following the food grade protocol developed.

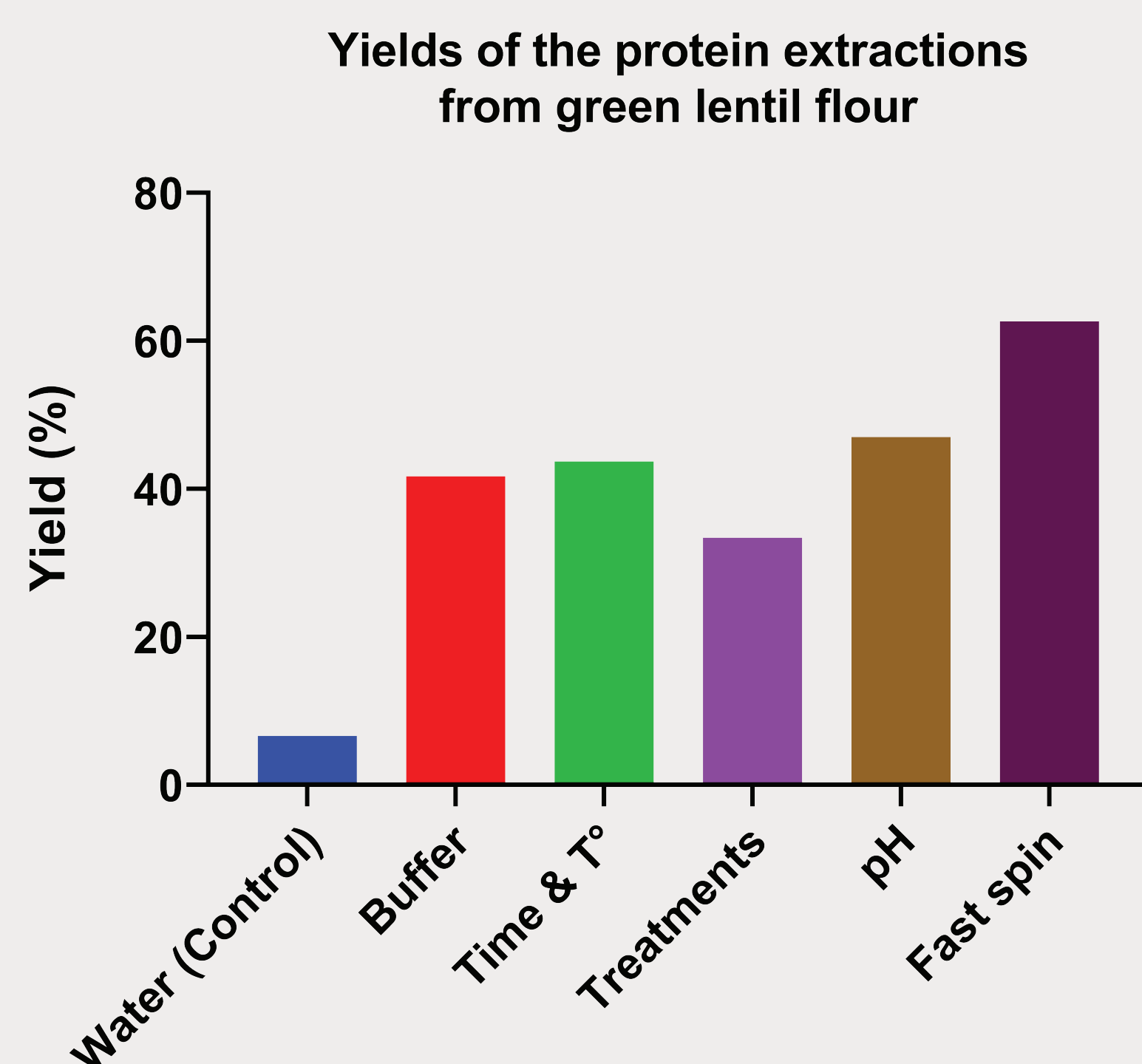


Figure 2: Bar graph of the yields of tested protocols. Each test was realized with 10% (w/w) of green lentil flour. Name of the series is the tested variable

Why bioactive peptides are important?

- Nutraceutical Market Value:** 291.33 billion USD in 2022
- Bio-active peptides Share:** 4,96 billion USD in 2022
- Expected growth:** 9.4% from 2023 to 2030
- Food waste and derived byproducts in the EU:** 222 million tons in 2017

Enzymatic hydrolysis of proteins extracted from green lentil flour

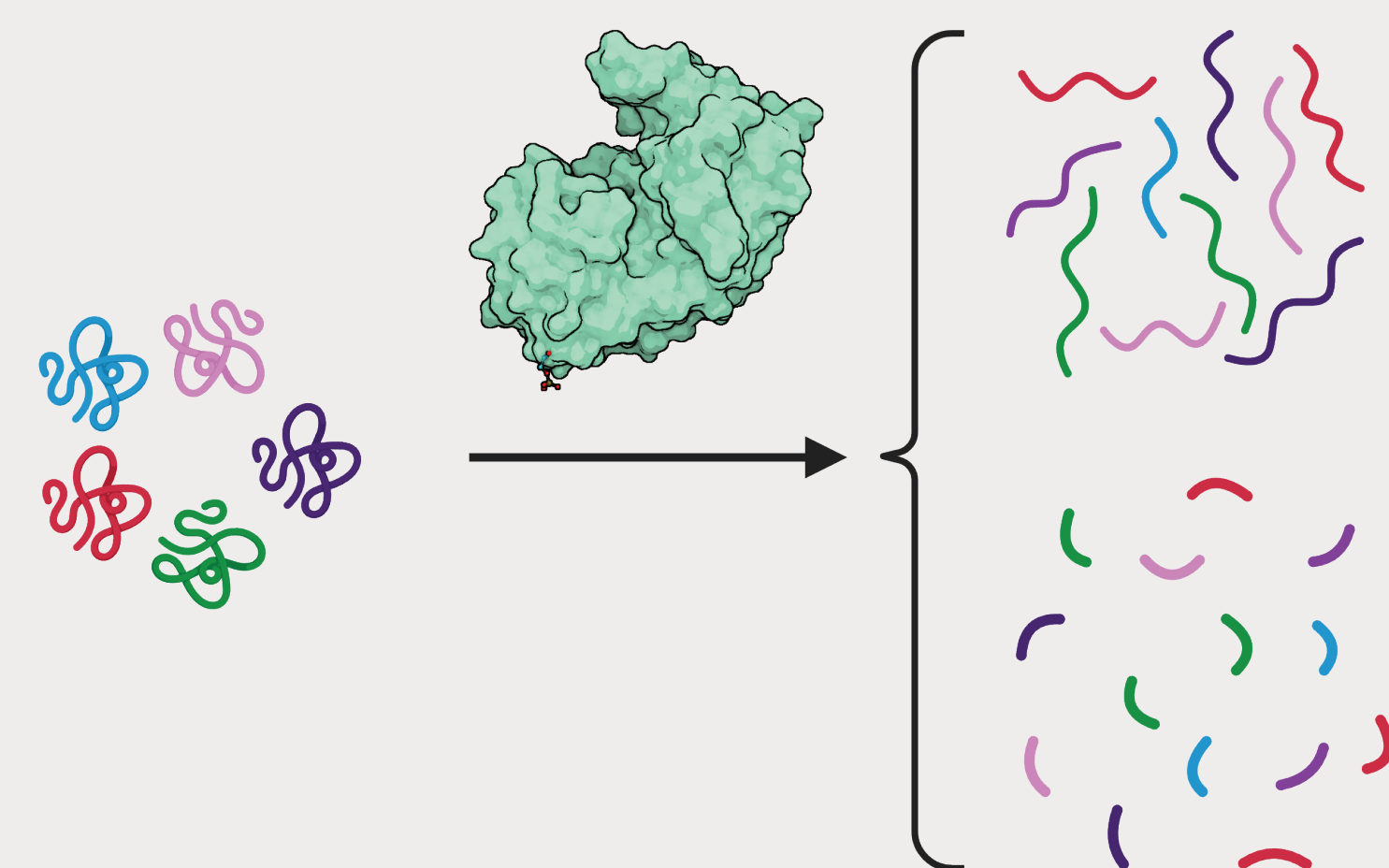


Figure 3: Graphical representation of the enzymatic hydrolysis from proteins into small peptides using a protease

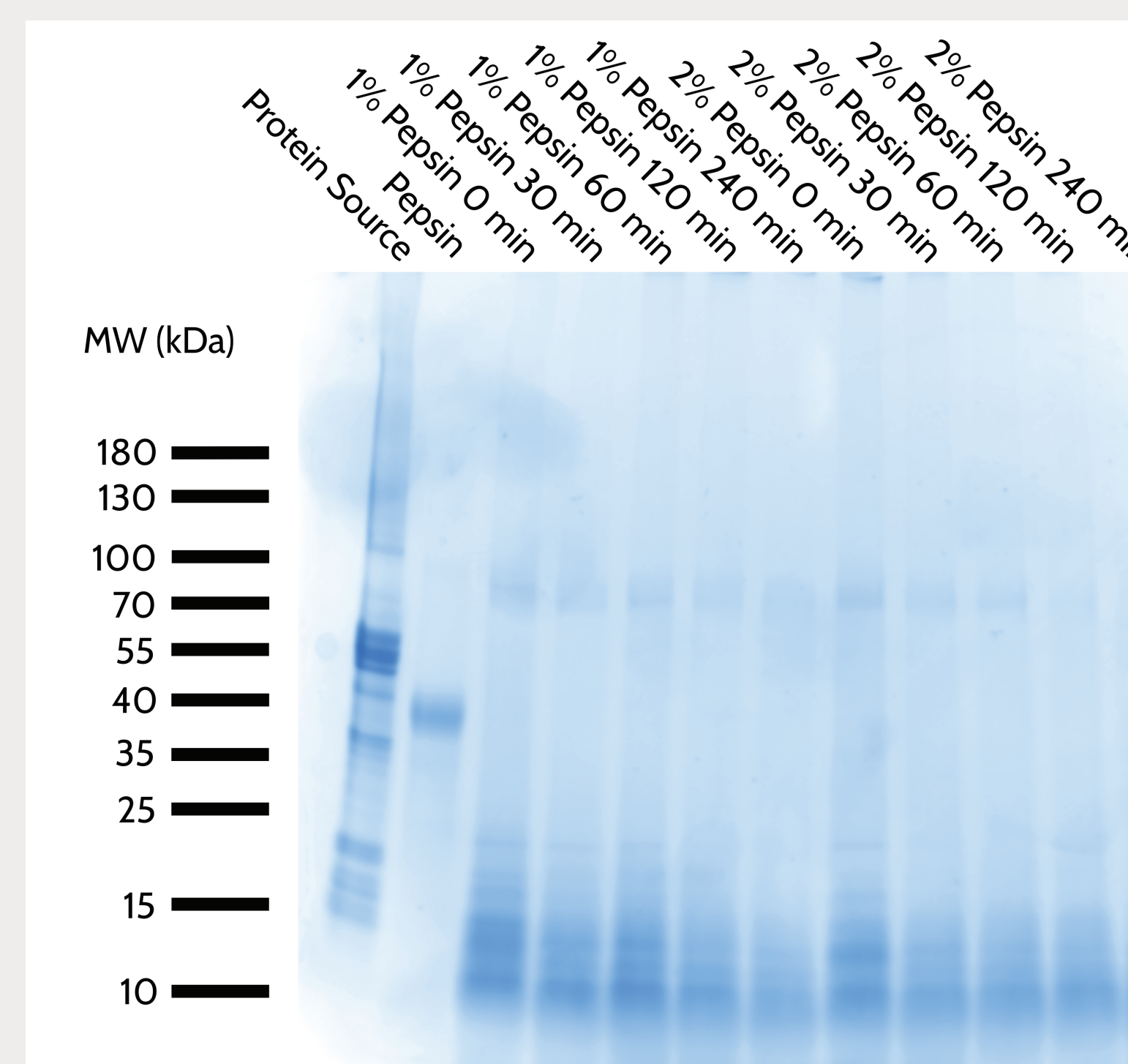


Figure 4: SDS-PAGE showing the enzymatic hydrolysis using pepsin. The generated fragments will be further characterized using mass spectrometry to analyze the size distribution

Conclusions

Our data shows that we successfully setup a food-grade protein extraction protocol from green lentil flour. Also our protease hydrolysis assay shows that we can generate small peptides that can be tested for potential biological activities.

Acknowledgments

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