

# Influence of protein structure, heat treatment, and gastric conditions on digestion efficiency and bioactive peptide generation from potato protein isolate

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## INTRODUCTION

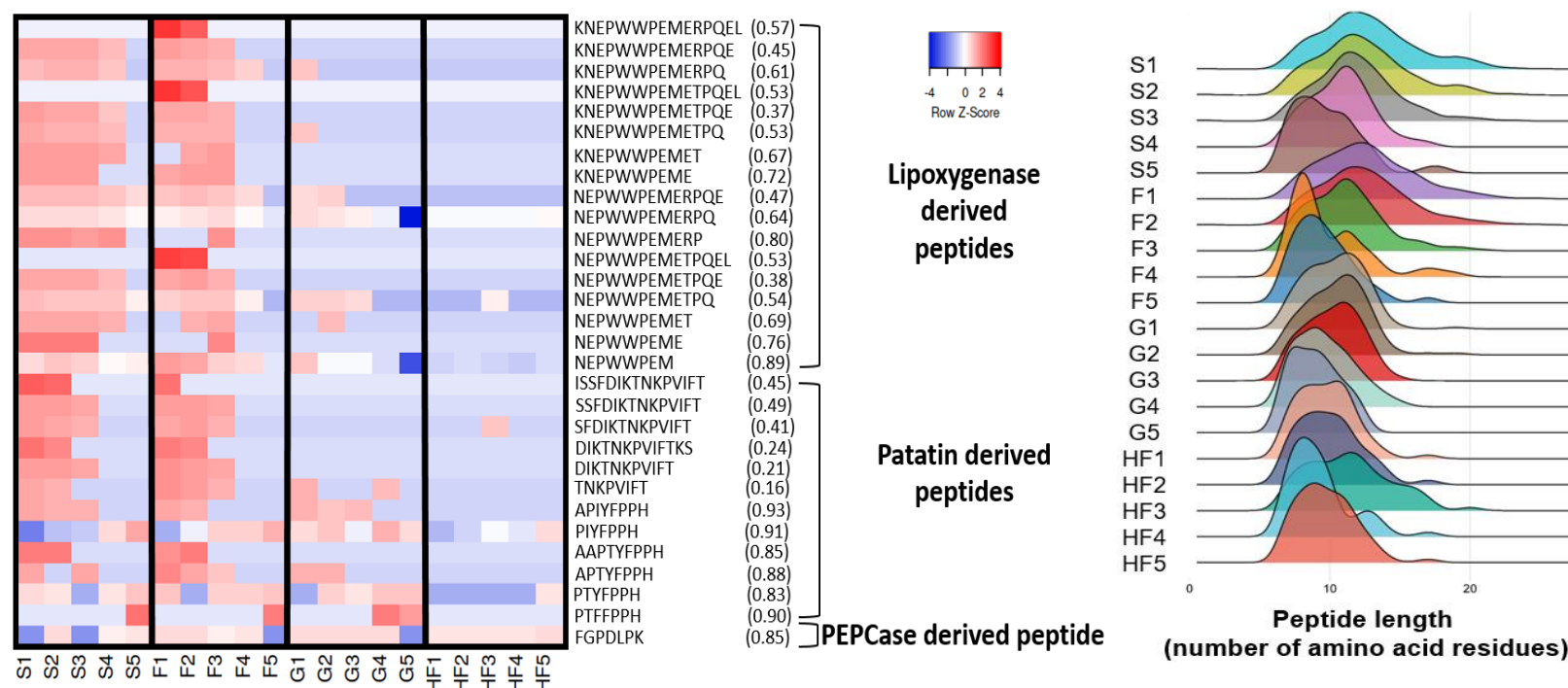
Potato protein isolate is a promising protein source due to its nutritional profile and functional properties. However, the influence of protein structure and processing history on bioactive peptides derived from this source, remain largely unexplored. This study confirmed presence of bioactive peptides from the digesta.

## MATERIALS & METHODS

Potato protein isolate was used to elaborate suspension, foam, gel and heated foam (4% protein, w/w), A semi-dynamic *in vitro* digestion model was utilised and digestion products were analysed using nanoLC-MS/MS to unveil peptide profiles. *In silico* bioactivity assessment involved matching the obtained peptide sequences against a database of potato proteins obtained from uniprot.org. We identified specific peptides with potential health benefits, such as antioxidant and angiotensin-converting enzyme inhibitory activities.



## RESULTS



Peptides	Peptide Ranker score	FRS score	Anti-microbial	Anti-inflammatory	Anti-Hypertensive
APIYFPPH	0.93	✓		✓	✓
EPWWPEM	0.92	✓	✓	✓	
PIYFPPH	0.91	✓		✓	✓
PTFFPPH	0.9	✓	✓	✓	✓
NEPWWPEM	0.89	✓		✓	

**Table 1.** Comprehensive *in silico* bioactivity Assessment of peptides from a potato protein isolate derived from *in vitro* digestion. (<http://distilldeep.ucd.ie/PeptideRanker/>). (<https://services.healthtech.dtu.dk/services/nOxPePred-1.0/>) (<http://www.camp3.bicnirrh.res.in/index.php>)

## CONCLUSIONS

Peptide APIYFPPH (93% predicted *in silico* bioactivity) was detected in the suspension, foam and gel at the early stages of intestinal digestion, while a shorter peptide PIYFPPH (91% predicted *in silico* bioactivity) was found at the last intestinal point for all the structures. Heat treatment enhanced protein digestibility, leading to distinct peptide patterns and distributions compared to untreated structures. This study confirmed the presence of bioactive peptides from the intestinal digesta of potato protein isolate structures.