

ACRYLAMIDE MITIGATION IN RED LENTIL COOKIES USING FILAMENTOUS FUNGI FERMENTATION WITHIN A TARGETING ASPARAGINE REDUCTION APPROACH

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Legumes and Innovative Food Products

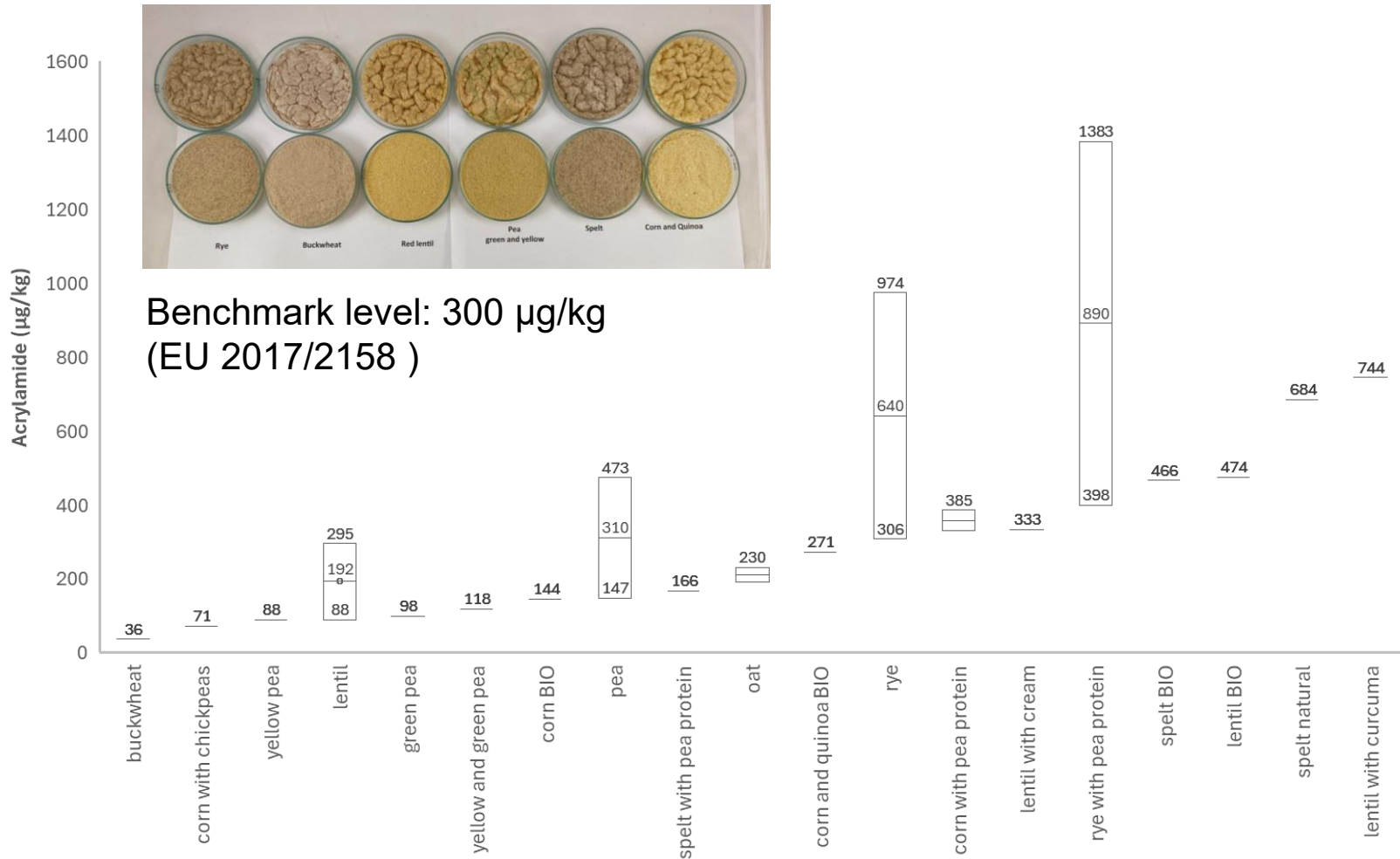


Benefits in Nutrition

- Plant-based proteins
 - Dietary fiber
- Vitamins (folate, B vitamins)
- Minerals (iron, magnesium, potassium)
 - Low glycemic index

Innovative cereal-based food products and puffed snacks

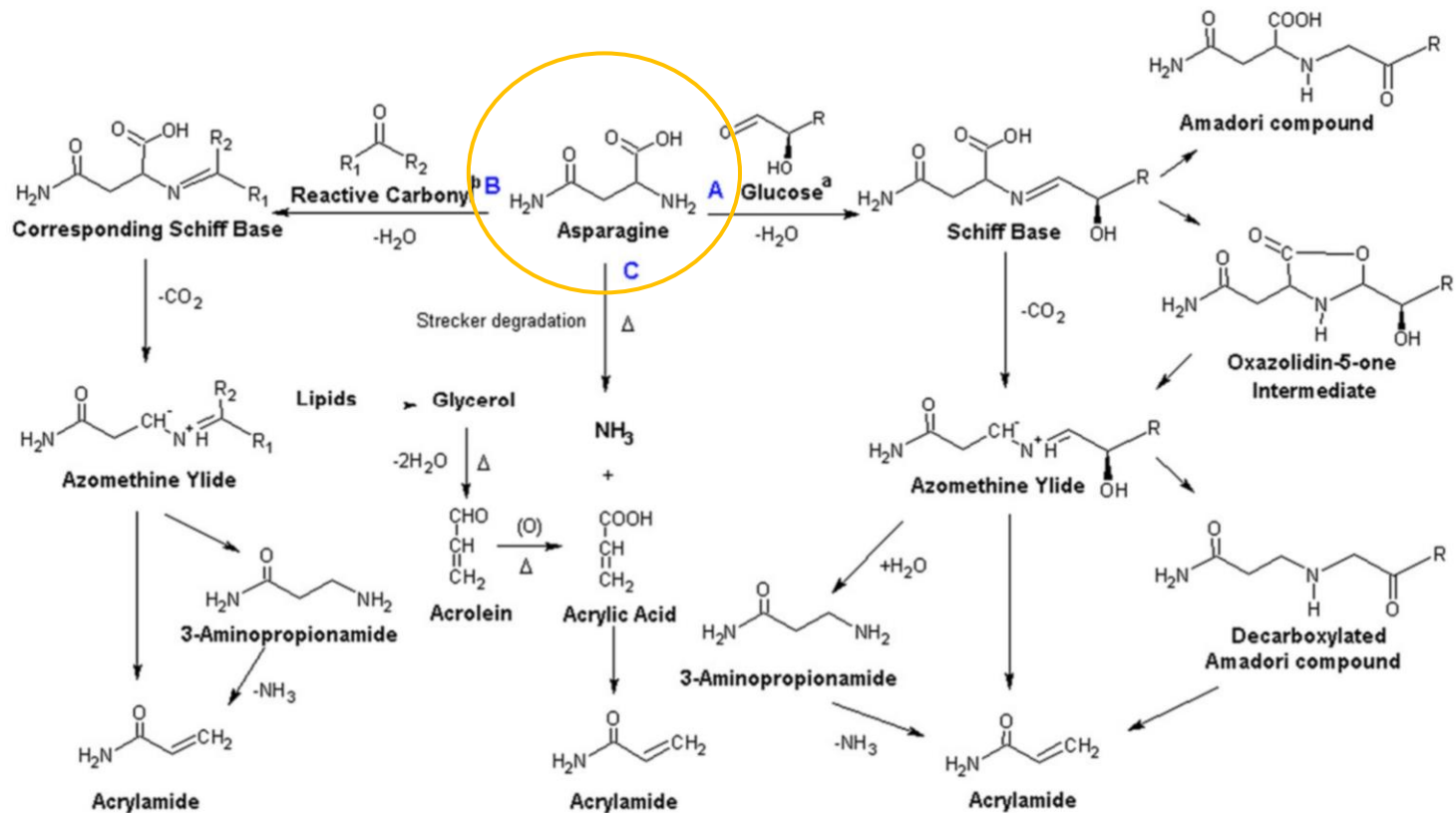
Acrylamide Content Across Puffed Snacks



Acrylamide Mitigation Strategies



Acrylamide Formation During Baking



Semi-solid fermentation by filamentous fungi

APVV-23-0169 (2024-2028)

- *Mortierella alpina*
- *Actinomucor elegans*
- *Umbelopsis isabellina*



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Valorization of raw-material:

- PUFA (γ -linolenic/arachidonic acid)
- β -carotene
- Ergosterol
- Antioxidant activity
- Dietary fiber
- Free asparagine + acrylamide formation (lab-scale baking experiment)

SSF conditions:

25 °C, 50 % r.h., 7-10 days

Lab-Scale Baking Experiment



Control lentil flours:



raw



pasterized

Fermented lentil flours:



Mortierella alpina

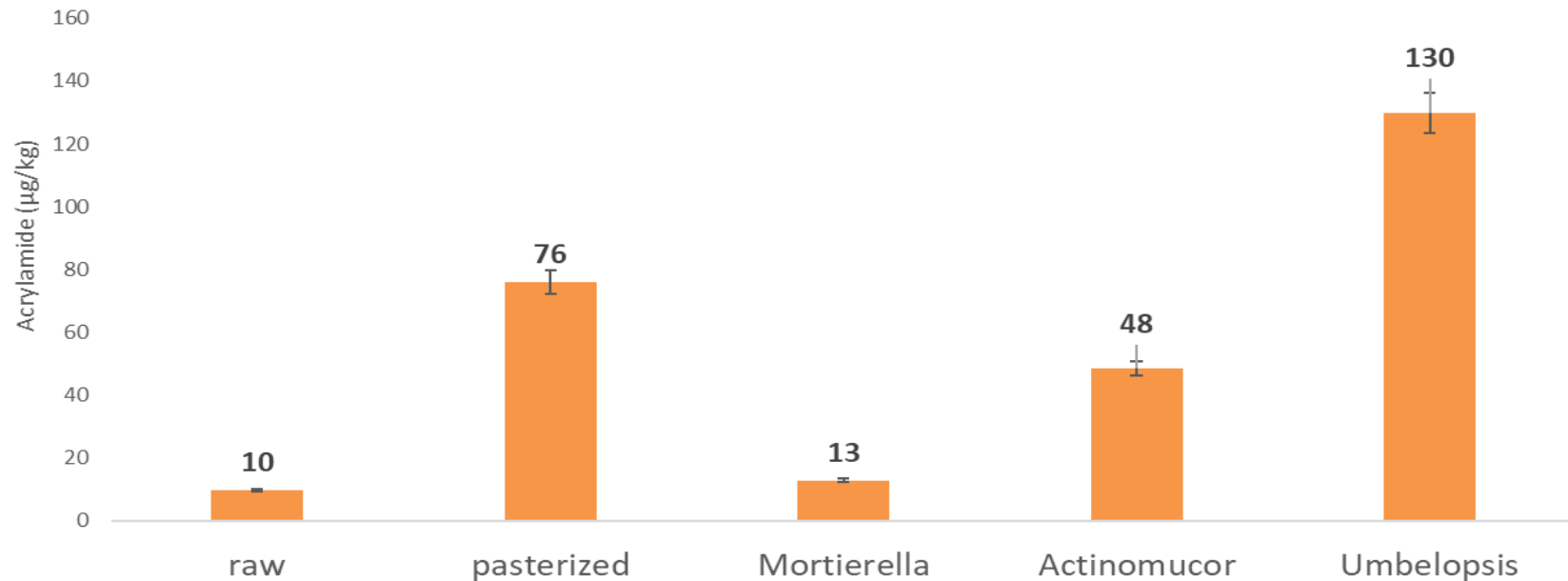


Actinomucor elegans



Umbelopsis isabellina

Acrylamide content in biscuits



raw



pasterized



Mortierella alpina

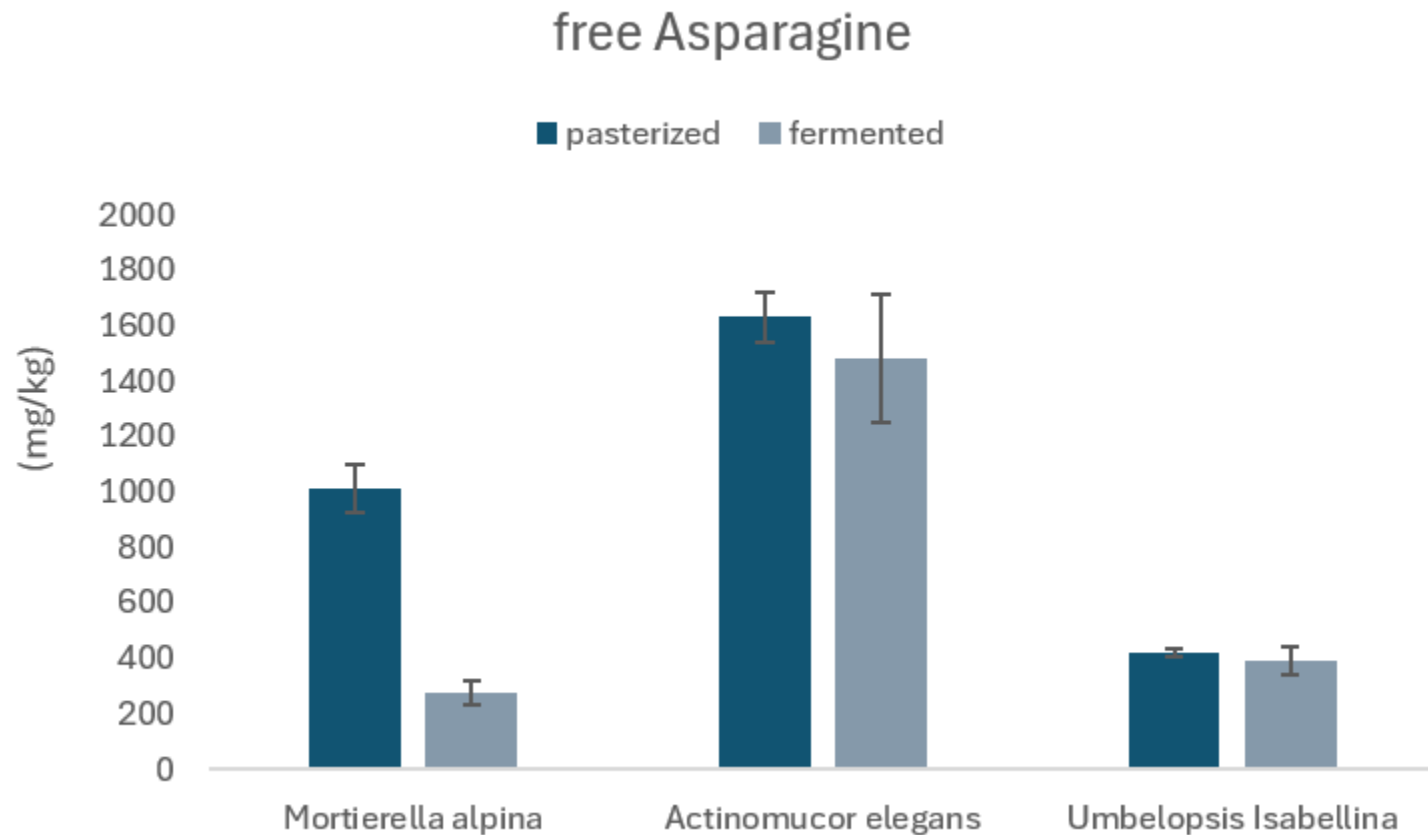


Actinomucor elegans

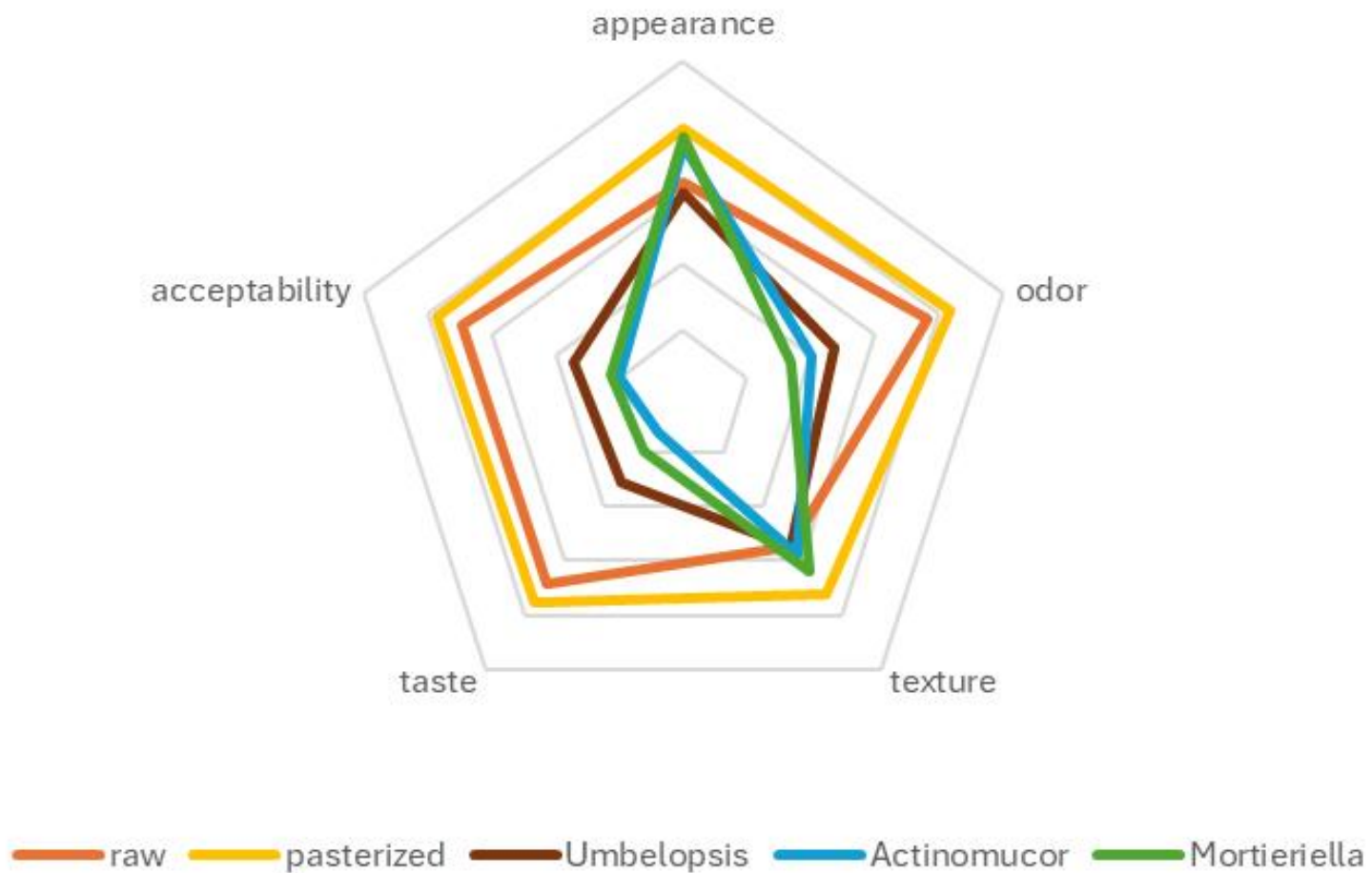


Umbelopsis isabellina

Asparagine content in flours



Sensory analysis



Conclusion

- ***Mortierella alpina*** effectively degraded free asparagine and reducing acrylamide formation - more than **80 %**
- ***Actinomucor elegans*** was more effective at improving nutritional profile with **30 %** mitigation of acrylamide
- *Umbelopsis isabellina* was not effective in acrylamide mitigation;
- Further investigation:
 - Fermentation (time; moisture; strain selection; co-culture)
 - Post-processing
 - Formulation

Thank you for attention!

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