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Evaluating the aroma compounds and structural Properties of Plant-based seafood Analogues using Pea (*Pisum sativum* L.) and Faba bean (*Vicia faba*) Protein Isolates

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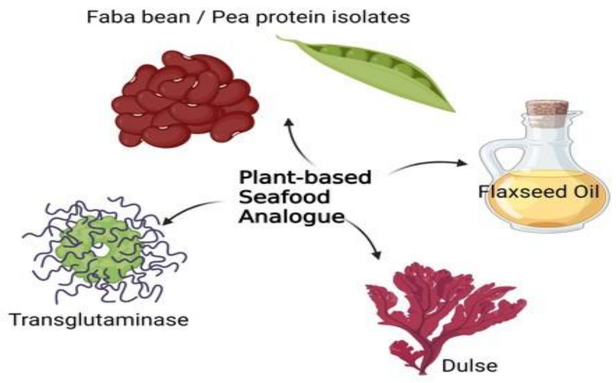
INTRODUCTION

- Challenges such as **overfishing** and pesticide usage have been encountered in the harvesting and cultivation of seafood, resulting in **environmental pollution** and **risk to human health** (1).
- **Plant-based alternative** seafood products are formulated to **mimic properties** of parts or whole fish tissue.
- **Functional ingredients** used in the development of alternative seafood product include **proteins**, **carbohydrates** and **lipids** (2).

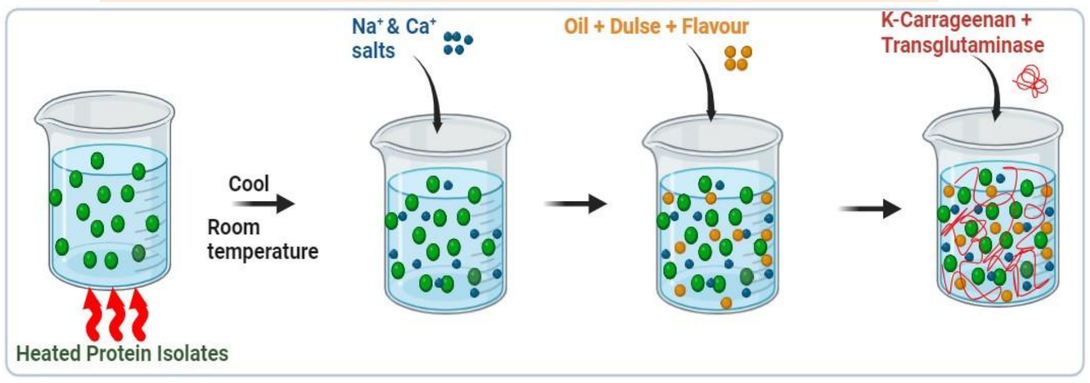


OBJECTIVES

1. To produce three alternative Seafood Analogues containing Faba bean and Pea protein isolates (FB90, PP85, PP80).
2. To determine the volatile Aroma Compounds and the Texture Attributes of the samples.
3. To determine the sensory perception and preference among the samples made.

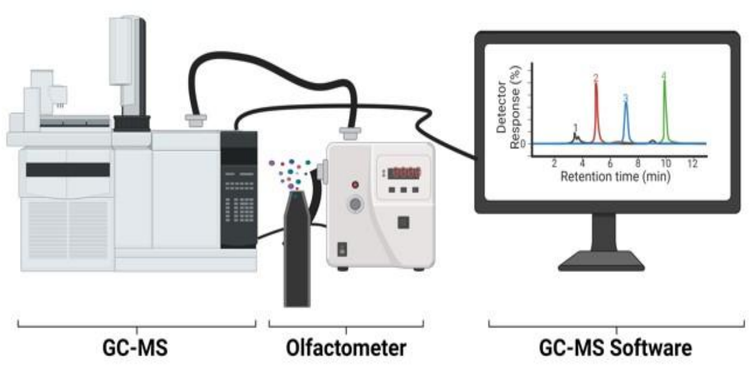
MATERIALS AND METHOD

Production of plant-based Seafood Analogues

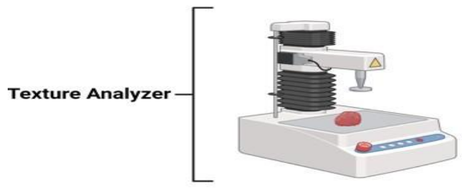


Grilling

Identification and characterization of Aroma compounds



Determination of mechanical properties



RESULTS

Table 1. Key aroma compounds observed based on relative abundance in each product.

Grilled Salmon	Grilled P80	Grilled P85	Grilled FB90
Cyclohexasiloxane, dodecamethyl-	2-Heptanone	D-Limonene	D-Limonene
[(4-Hexylbenzene-1,3-diyl)bis(oxy)]bis-(trimethylsilane)	4,6'-Dimethoxy-2'-(tert.-butyldimethylsilyl)-oxychalcone	Cyclohexasiloxane, dodecamethyl-	Cyclohexasiloxane, dodecamethyl-
Pentadecane	[(4-Hexylbenzene-1,3-diyl)bis(oxy)]bis-(trimethylsilane)	[(4-Hexylbenzene-1,3-diyl)bis(oxy)]bis-(trimethylsilane)	3-Isopropoxy-1,1,1,7,7,7-hexamethyl-3,5,5-tris(trimethylsiloxy)-tetrasiloxane

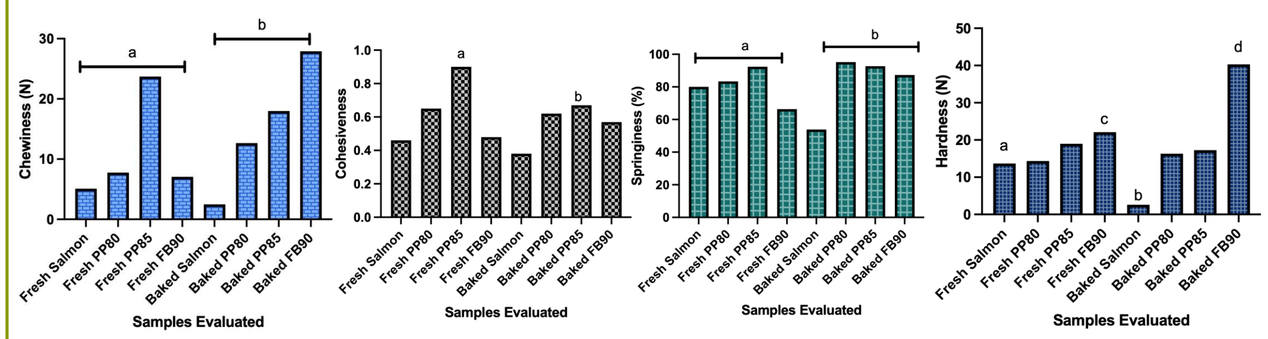


Figure 1. TPA data from raw and baked samples.

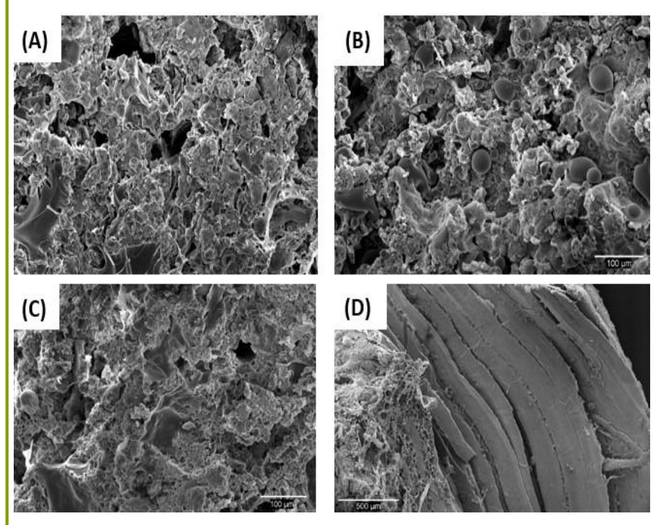


Figure 2. Scanning electron microscopy images of Alternative Seafood products: FB90 **(A)** PP85 **(B)** PP80 **(C)** and Salmon muscle **(D)**.

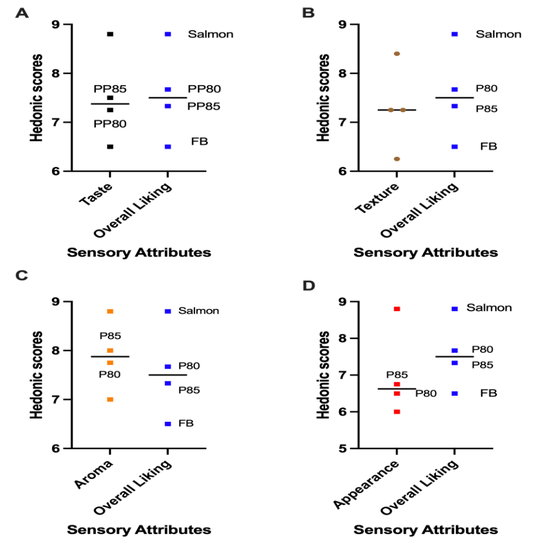


Figure 3. Hedonic data of all samples. **(A)** Taste **(B)** Texture **(C)** Aroma **(D)** Appearance.

CONCLUSIONS

1. The results of this preliminary study showed that the alternative seafood product contained similar volatile compounds compared to the reference sample, with aldehydes, ketones, hydrocarbons, and cyclic siloxanes identified as the major class of compounds.
2. The texture data for the samples indicated the formation of products that can withstand the application of mechanical force in comparison to Salmon muscle.
3. These data show the potential for improving plant-based alternative seafood product with the formulated blends from faba bean and Pea protein isolates.

REFERENCES

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