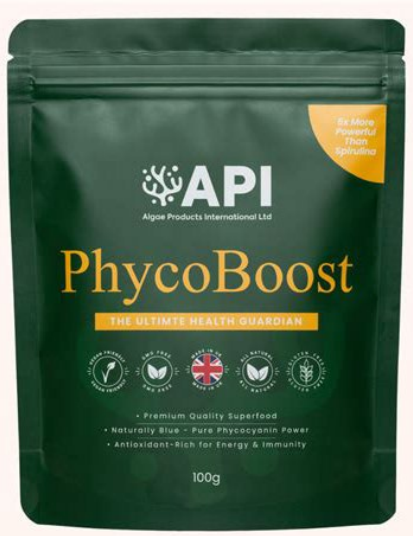
Abertay University

From Shore to Store: Making Seaweed More Consumer-Friendly

#BeAbertay

Bridging sensory science and product innovation in seaweed foods.

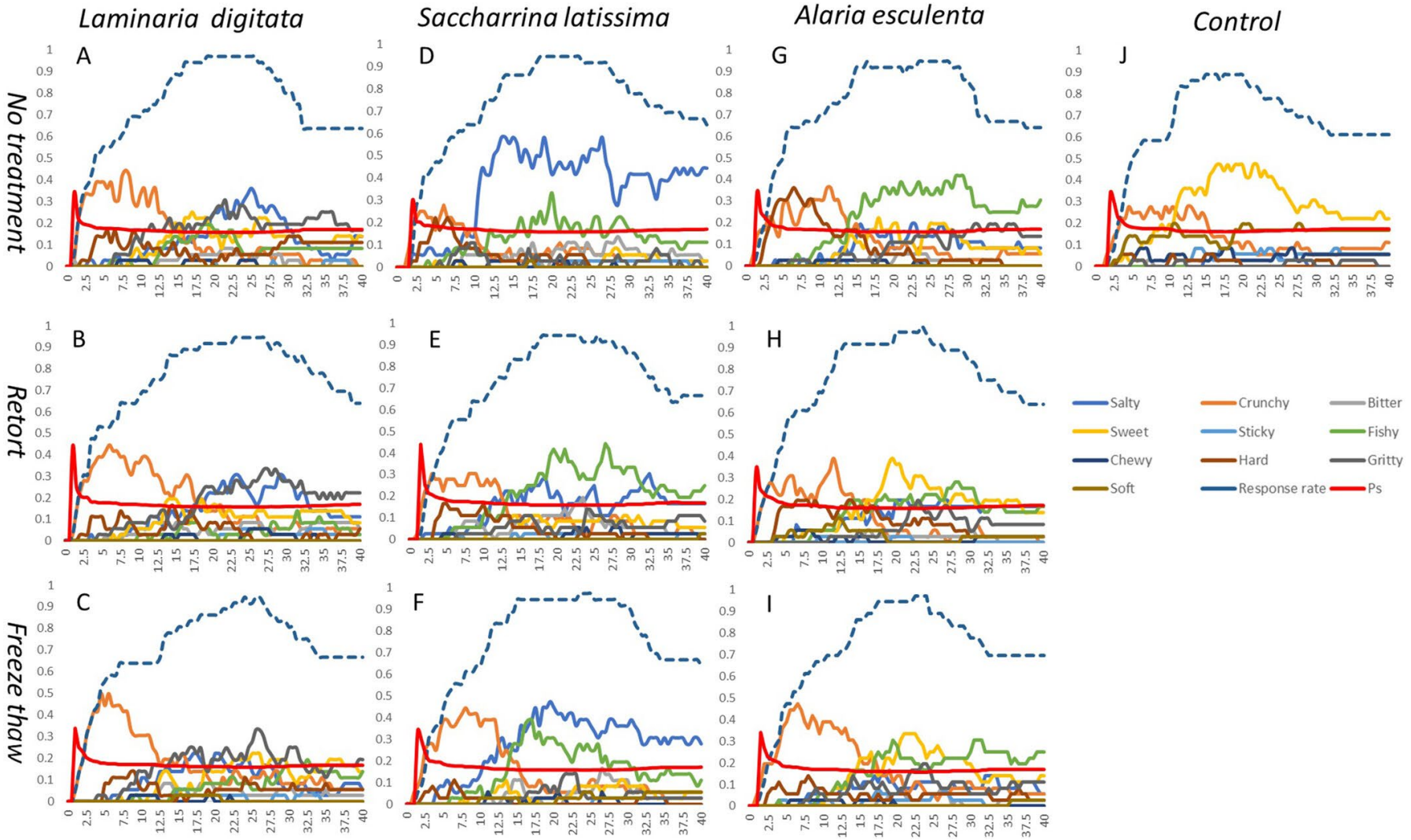
We know seaweeds are nutritious and sustainable – but consumers won't eat what they don't enjoy.



Abertay University

#BeAbertay

Aroma and Taste



Temporal dominance of sensations (TDS) is presented for each species of seaweed (*Laminaria digitata* (A–C), *Saccharina latissima* (D–F), and *Alaria esculenta* (G–I)) under the no treatment condition (A, D, G), retort (B, E, H), and freeze–thaw (C, F, I), as well as the control (J), which contained no seaweed.

Abertay University

Ledbetter, M., Ross, K., Templeman, J., Chu, B.S. and Wilkin, J.D., 2025. Effect of Pre-Processing Treatment and Concentration of Alaria esculenta, Saccharina latissima, and Laminaria digitata Varieties on Texture and Consumer Attribute Preference of Crackers. Food Science & Nutrition, 13(1), p.e4710.

#BeAbertay

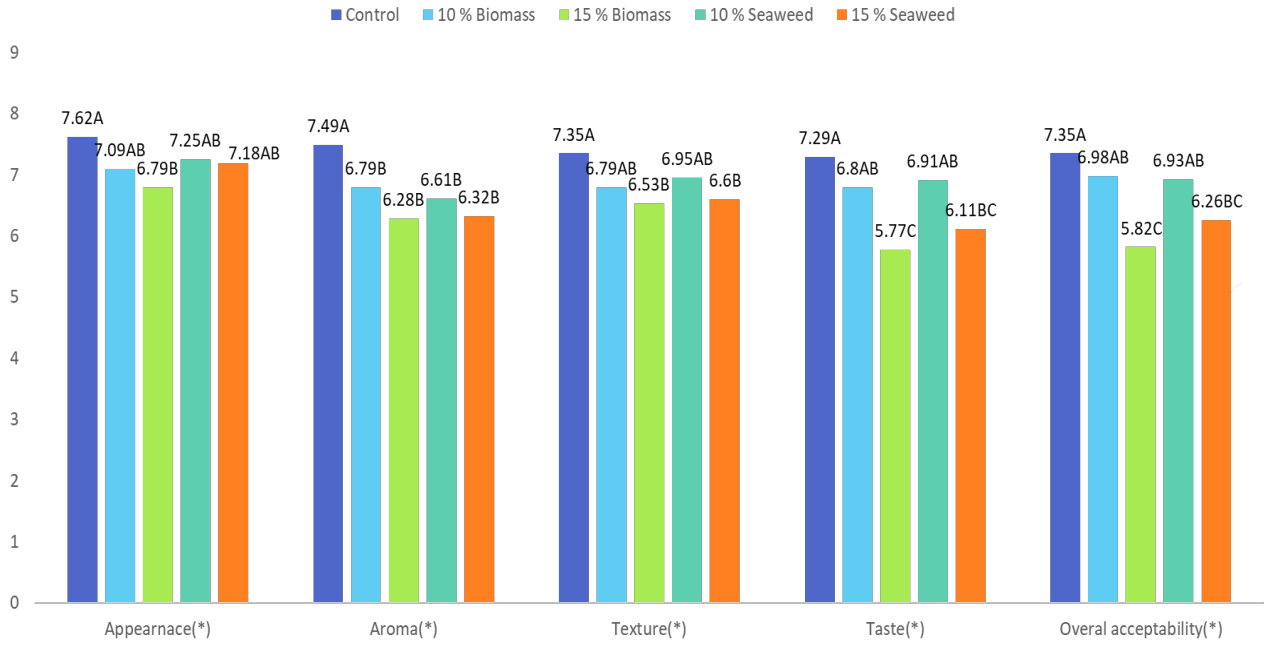
DMS (Dimethyl Sulphide) — Current PhD Research

Methionine
↓ (MTA)
4-methylthio-2-oxobutyrate (MTOB)
↓ (MTOB-reductase)
4-methylthio-2-hydroxybutyrate (MTHB)
↓ (S-methyltransferase)
4-dimethylsulfonio-2-hydroxybutyrate (DMSHB)
↓ (2-hydroxyacid oxidase)
Dimethylsulfoniopropionate (DMSP)
↓ (DMSP-lyase)
Dimethyl sulphide (DMS) + acrylate

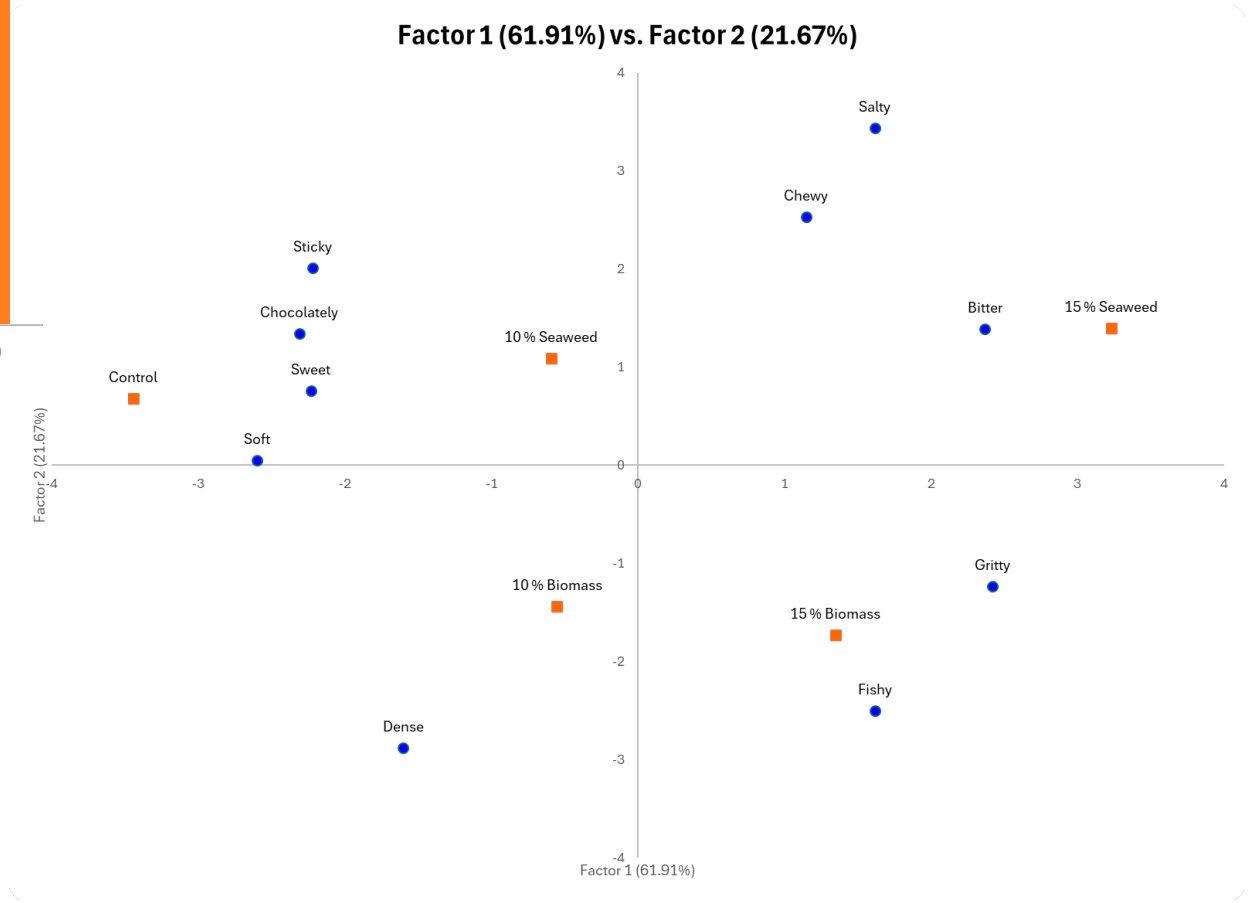
Relevance to Aroma Control

- High methionine turnover and active S-methyltransferase → higher DMSP → more DMS (stronger “sea” aroma).
- Heat or blanching inactivates DMSP-lyase → less DMS generation during food processing.
- Understanding this chain allows us to explore biochemical or processing interventions to manage flavour at its source.

Protein balls – new work in progress



Understanding which attribute determines consumerism in food products will unlock the way we format foods.



Inclusion threshold increased to 10 % seaweed (vs. 6 % previously) without sensory penalty

Abertay University

Future plans

- Characterise post-harvest DMSP → DMS dynamics in brown seaweeds, and determine how processing conditions (e.g., blanching, heating, fermentation, freeze–thaw) influence volatile sulphur compound formation.

- Identify formulation strategies to manage sensory impact, including the role of ingredient interactions, matrix effects, and flavour-masking compounds during product development.