

Valorisation of sea bream by-products through its inclusion in fish and shrimp burgers

Introduction

Overfishing is leading to a decline in natural resources

Threat to food security and urgent need to seek more sustainable and environmentally friendly food supplies



World aquaculture fish production has experienced exponential growth¹

Generation of approximately 70% of waste from the fishing industry → By-products



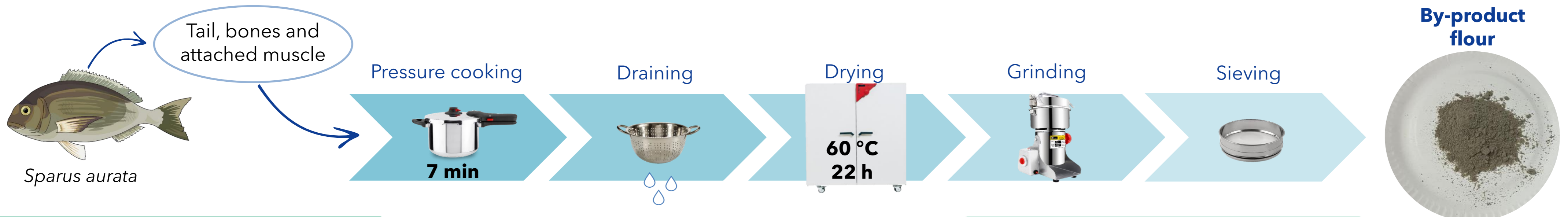
Fish by-products have a high nutritional value, so their use for human consumption is of great interest

Aim

This work aimed to **introduce the by-products** generated by the sea bream processing industry **as a new ingredient** in the production of healthy and sustainable fish and seafood burgers.

Methods

Obtaining by-product meal

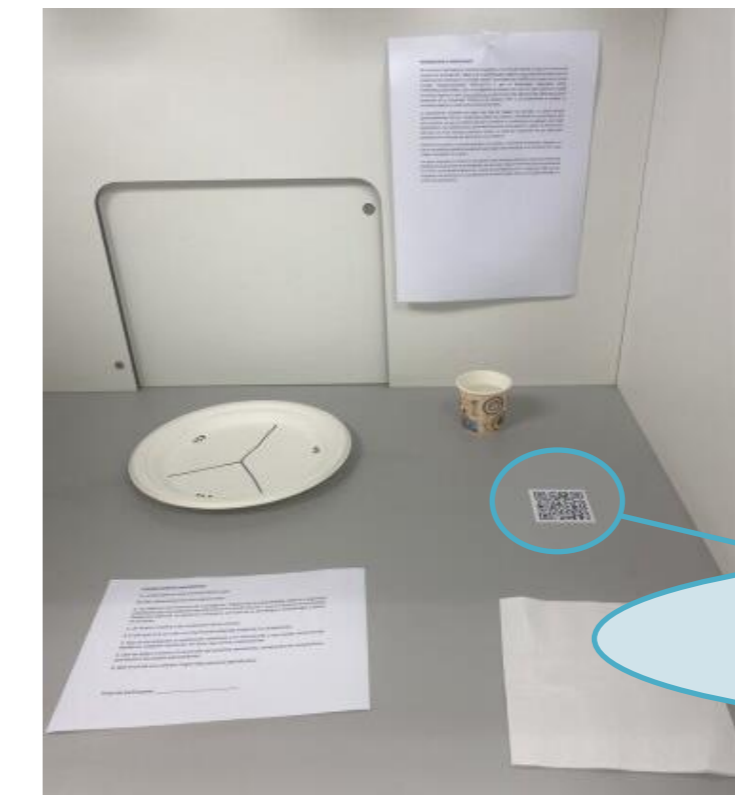


Preparation of the burgers

Table 1. Formulations of burgers.

Ingredients (g/100g)	Selected			
	C	BP10	BP7Sw	BP7S
Shrimp	49.5	44.5	44.5	44.5
Gilt-head bream	49.5	44.5	44.5	44.5
By-product flour	-	10	7	7
Salt	1	1	1	1
Seaweed/microalgae (spirulina)	-	-	3	3

Sensory evaluation



70 consumers

Questionnaire (9-point hedonic scales)

Results & Discussion

- ✓ The **control burgers** were highly acceptable, with values above 7 out of 10 for all attributes.
- ✓ The presence of the **by-products** caused a **decrease in sensory** acceptability.
- ✓ The **odour and flavour of BP10** were evaluated with values of **7.4** and **7**, respectively, but the **overall acceptance was slightly below 7**, mainly due to the colour attribute.

Appearance

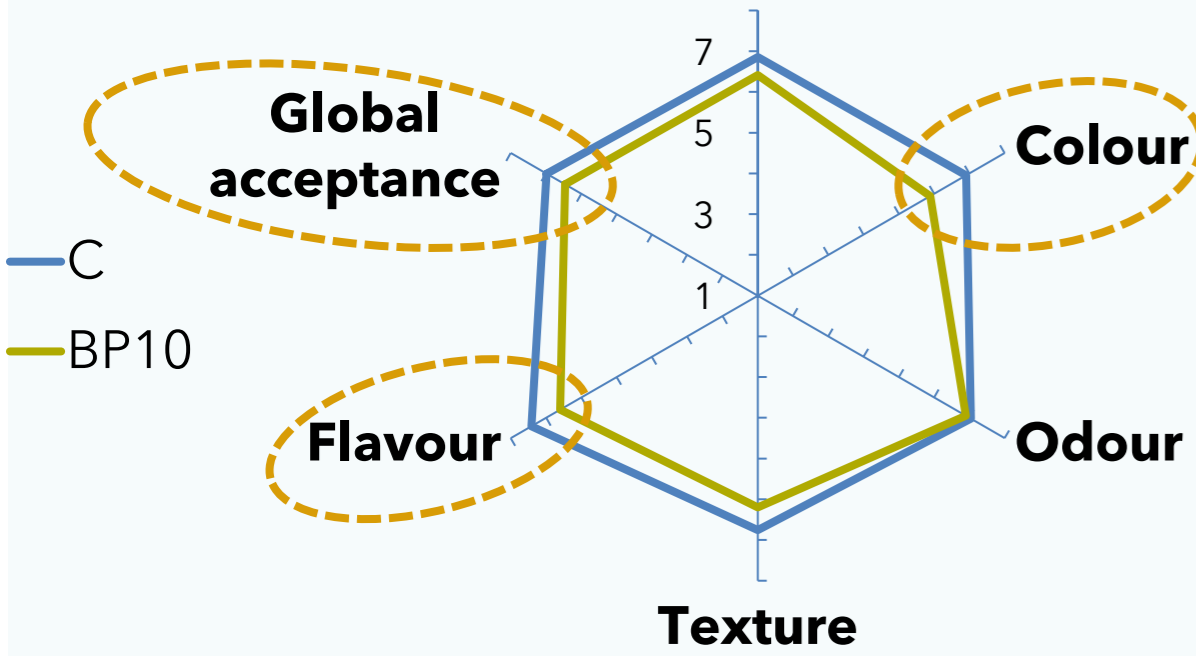
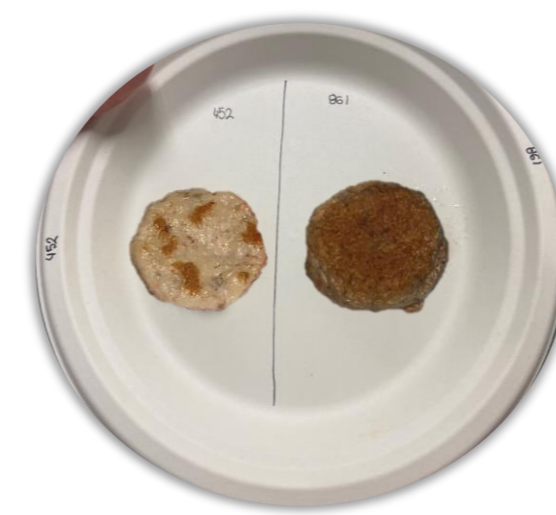


Figure 1. Average score given by consumers to the attributes assessed in the burger samples.



In which way the presence of by-products in samples would affect the global acceptance?

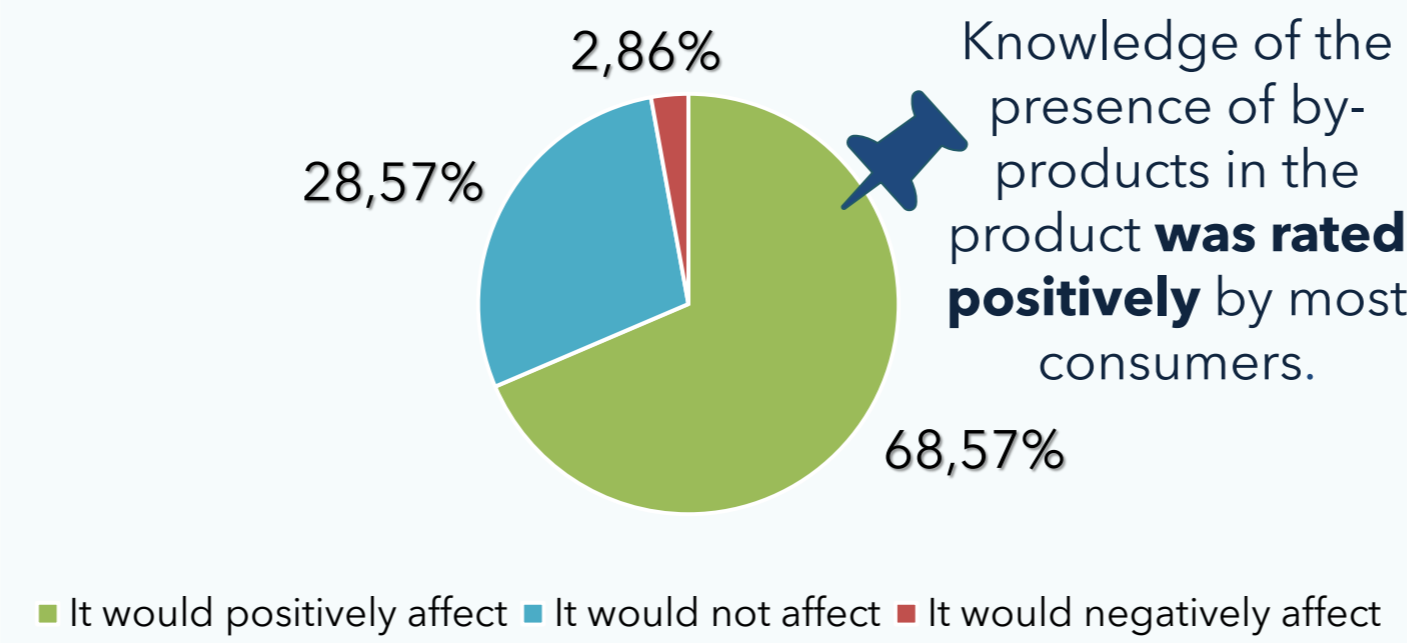


Figure 2. Percentage of responses on consumers' opinion of the presence of by-products in samples

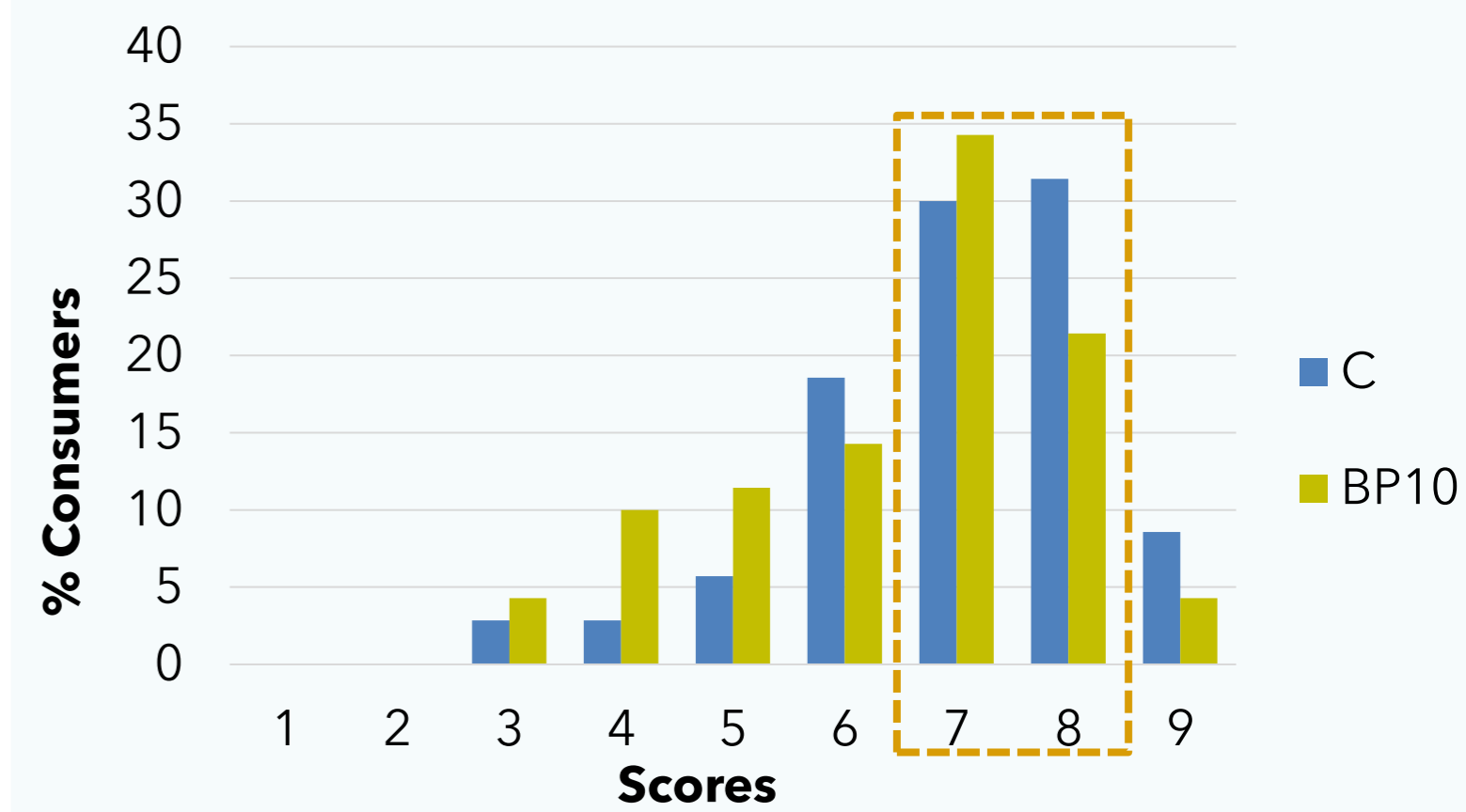


Figure 3. Distribution of the scores given by the consumers to the global acceptance of the burger samples.

- ✓ For both formulation **C** and **BP10**, a **higher number of responses** were clustered in ratings **7** and **8**.

Conclusion

The inclusion of sea bream by-products as a new ingredient has **great potential** to be used in the production of fish products, as the knowledge of the inclusion of by-products **has a positive effect on the consumer**. However, in the case of burgers, it would be **necessary to improve the colour** of the burgers. On the other hand, the use of this by-product flour could be **interesting in battered fish products**, where the dark colour of the by-products could be masked by the batter.

Acknowledgements

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Reference

1. Sanches-Fernandes, G. M. M., Sá-Correia, I., & Costa, R. (2022). Vibriosis Outbreaks in Aquaculture: Addressing Environmental and Public Health Concerns and Preventive Therapies Using Gilt-head Seabream Farming as a Model System. *Frontiers in microbiology*, 13, 904815. <https://doi.org/10.3389/fmicb.2022.904815>