

A Comparative Study of Insect-Based Food Acceptance in the Dietary Habits of Portuguese Couples

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INTRODUCTION

The rising global population and shifting dietary patterns are increasing the demand for sustainable food sources, particularly alternative proteins. Edible insects, though presenting nutritional, health, and environmental benefits, remain underutilized due to low consumer acceptance and poor sensory properties. Enhancing public perception through education about their benefits and sensory properties may improve acceptance and social and cultural norms.

METHODOLOGY

In order to evaluate consumer responses to three insect-based foods (granola, pasta, and bars), this study prepared a food basket for participants so that these foods could be integrated into the diet of Portuguese families.

Intervention approach

LAB WEEK 0	HOME WEEK 1	HOME WEEK 2	HOME WEEK 3	LAB WEEK 4 & 8
Sensory test • Full basket evaluation; • Initial panel characterization questionnaires.	Weekly basket • Preparation of assigned products (free preparation mode); • Evaluation of sensory profile (overall liking); • Report on the amount consumed (intake), hunger and satiety levels;			Sensory test • Full basket evaluation (W4); • Final Food Frequency (W8).

72 eligible couples (n=144) are randomly assigned to two parallel treatment groups: with **edible insect** or with **plant-based alternative** (Figure 1). All participants are omnivores and do not have any food allergies.

	GRANOLA	PASTA	BARS
Insect-based			
Plant-based			

Questionnaires

- Food Frequency (ISPUP, Porto)
- Meat Attachment (Graça J. *et al.*, 2015)
- Food Neophobia (Pliner P. *et al.*, 1992)
- Sustainability Scale (Haws K.L. *et al.*, 2014)
- Food Choice (Steptoe A. *et al.*, 1995)
- Alternative Protein Attitude (Osgood *et al.* 1967)
- Emoji-based Disgust (Ribeiro J.C. *et al.*, 2023)

Figure 1: Samples included in the study.

CONCLUSION

Acceptability of novel protein sources was found to be **product-dependent**. Repeated exposure promoted higher consumption of protein alternatives and reduced meat intake. Participants in the insect-based group exhibited a significant decrease in **meat attachment**, while those in the plant-based group showed higher **Green Scale** scores, indicating strengthened pro-environmental attitudes. Despite the overall positive influence of repeated exposure, its impact was less pronounced in insect-based products.

RESULTS

Liking



Food Frequency Questionnaire Before vs After

Insect-based	Plant-based
Pulses p-value: 0.039 ↓	Fat fish p-value: 0.039 ↑
Red meat p-value: 0.013 ↓	White meat p-value: 0.035 ↓
Ready-to-eat meat products p-value: 0.000 ↓	Processed meat p-value: 0.005 ↓

Meat Attachment 7-point scale

Before: 4.6 ± 1.0 After: 4.5 ± 1.0 p-value: 0.045	Before: 4.9 ± 1.0 After: 4.7 ± 0.9 p-value: 0.075
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Green Scale 7-point scale

Before: 5.2 ± 1.0 After: 5.1 ± 0.8 p-value: 0.439	Before: 5.2 ± 0.7 After: 5.5 ± 0.8 p-value: <0.001
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