

Consumer Acceptance of Bioactive-Enriched Foods Derived from Citrus and Pomegranate Residues: Insights from the EXCEL4MED Project



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THE MALTA CHAMBER

Background on EXCEL4MED

EXCEL4MED is an EU-funded Horizon Europe project (2023–2026, €3.72M), coordinated by the National and Kapodistrian University of Athens. It aims to boost innovation in Mediterranean agri-food chains by transforming pomegranate and citrus by-products into nutritious foods such as juices, smoothies, and cheese in brine.

The initiative establishes Excellence Hubs in Greece, Malta, and France, creating a cross-border collaboration to strengthen Mediterranean food value chains. By connecting innovation ecosystems with companies, research institutions, governmental bodies, and societal actors, EXCEL4MED fosters sustainable food innovation and raises the level of excellence across the region.

Objectives

- Conduct a consumer survey in Greece, Malta, and France on functional foods made from citrus and pomegranate by-products developed through green technologies.
- Use quantitative and qualitative methods, complemented by living labs in Greece and Malta, to capture stakeholder insights and local ecosystem perspectives.
- Assess consumer acceptance, purchase intention, and willingness to pay a premium.
- Identify market segments, barriers to adoption, and negative perceptions, along with ways to address them.
- Provide evidence to support market-oriented strategies and guide sustainable Mediterranean food innovation.

Methodology

Surveys conducted in October till November 2023:

- Greece (730 responses, online)
- France (511 responses, online)
- Malta (600 responses, telephone survey)

Based on consumer behaviour models (Theory of Planned Behaviour [1], Health Belief Model [2], Environmentally Conscious Purchase Behaviour) and included a willingness-to-pay component.

Products tested:

- Smoothies
- Reduced-sugar juices
- Cheese in brine enriched with natural antioxidants

Results

• Consumer Values

Across all three countries, consumers strongly prefer foods that are natural, traditional, healthy, and local, while showing scepticism toward additives even vitamins. French consumers are generally more open to innovation compared with those in Greece and Malta.

• Consumption Habits

Fruit juices are most popular in France, but less so in Greece and Malta. Smoothies are consumed only to a limited extent in all three countries. Cheese in brine is common in France, moderately consumed in Greece (excluding feta), and limited in Malta.

• Willingness to Try

Despite limited familiarity, most consumers across all countries are open to trying new food products.

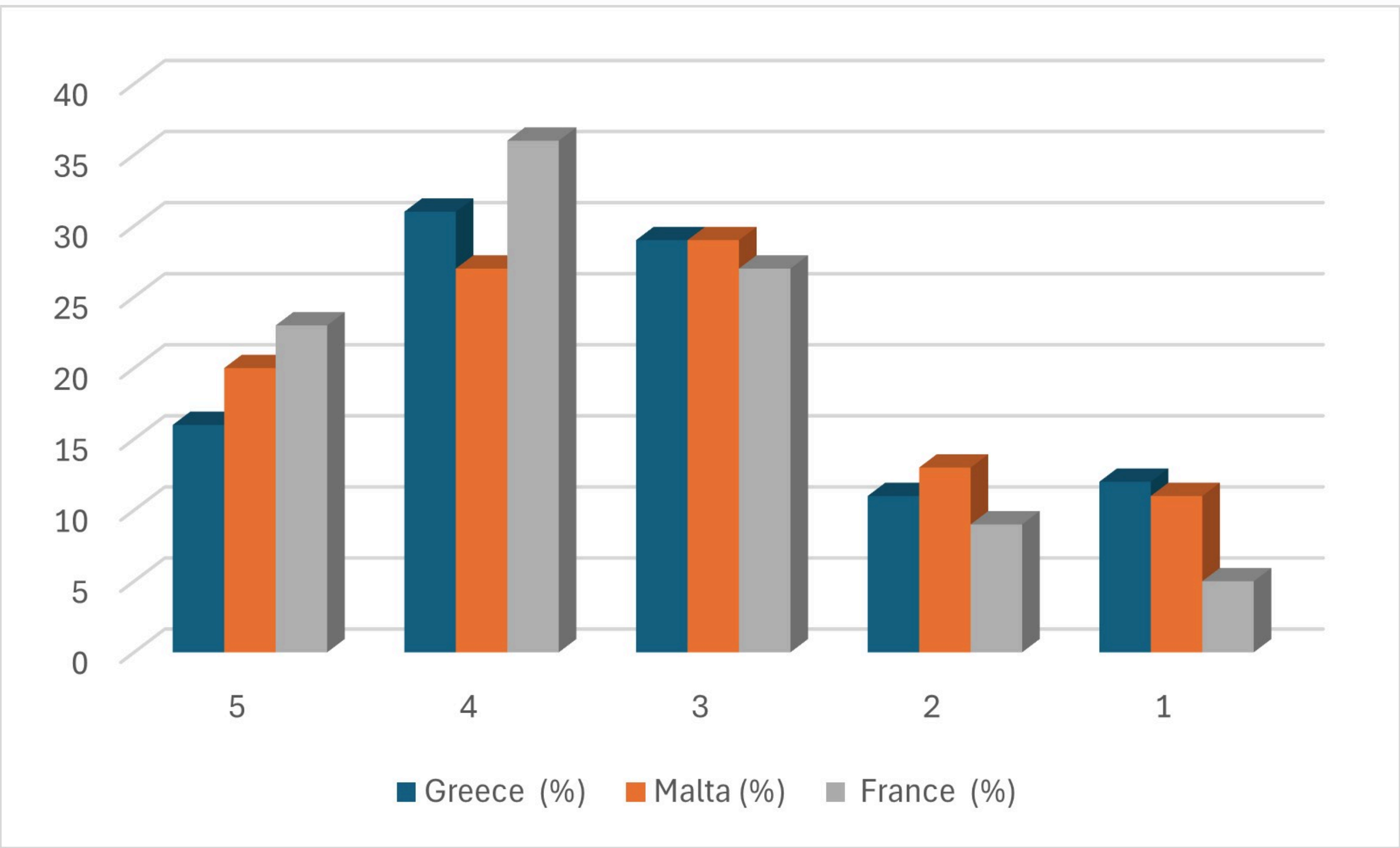


Figure 1: Willingness to try novel products.

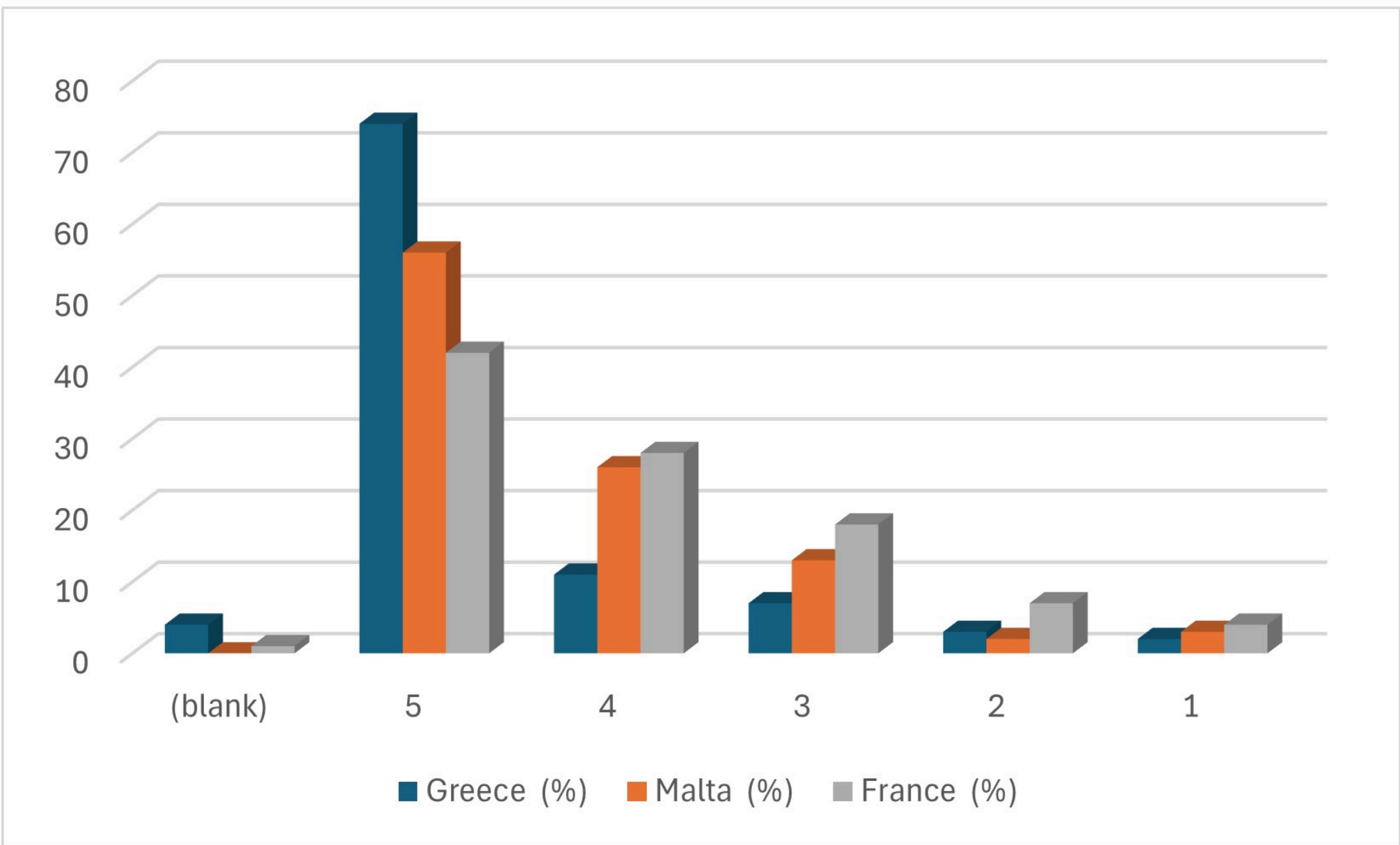


Figure 2: Purchasing behaviour- value given to health benefits.

• Willingness to Buy and Pay

Reduced-sugar juices attract the most interest, particularly in Greece, while smoothies and cheese in brine receive more neutral responses. Consumers are generally reluctant to pay a premium: willingness peaks at 5% extra in Greece and Malta, and up to 7–9% in France, especially for cheese in brine. Younger consumers (18–24) in Greece and Malta show more willingness to pay, while in France this is more evident among older consumers (41+). Higher income levels correlate with increased willingness to pay, though the effect remains modest.

• Main Barriers

Adoption is hindered by suspicion of additives, high price sensitivity, and limited familiarity with novel products such as smoothies or antioxidant-enriched cheese.

Conclusion

Across Greece, Malta, and France, consumers highly value natural, local, and healthy foods, with traditional products seen as especially trustworthy. While there is interest in trying new food products, resistance to additives, even vitamins, is a key barrier.

Willingness to pay extra for enriched novel foods is limited: generally, up to 5% in Greece and Malta, slightly higher in France (7–9% for cheese in brine). Naturalness, tradition, healthiness, and locality strongly influence choices, while cost and scepticism toward additives are the main obstacles to adoption.

References

[1] I. Ajzen, "The theory of planned behavior," Organizational Behavior and Human Decision Processes, vol. 50, no. 2, pp. 179–211, 1991.
[2] P. Sheeran, M. Conner, and P. Norman, "Can the theory of planned behaviour explain patterns of health behaviour change?," Health Psychology, vol. 20, no. 1, pp. 12–19, 2001.