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Development of Fortified Food Bars through the Valorization of By-Products Generated in Food Processing

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Abstract: *Food bars are a popular snack category, valued for portability, convenience and a balanced combination of nutrients. Enrichment with protein, dietary fiber and bioactive compounds can improve their nutritional value, texture and sensory quality. Valorizing food-processing by-products (pomace, peels, seeds, fruit and vegetable residues) is a promising route to functional, sustainable and affordable fortified bars, supporting waste reduction and circular economy principles.*

Keywords: food bars; fortification; by-products; bioactive compounds; functional foods; sustainability

• Introduction

- Key snack category: portable, convenient and nutritionally balanced
- Growing consumer demand for practical, nutritious and functional foods
- Formulated from cereals, dried fruits, seeds, plant or animal proteins, healthy fats and fiber-rich ingredients
- Food-processing by-products are a promising raw material for fortification
- Figure 1 shows fortified bars enriched with fruit by-products.



Figure 1. *Fortified food bars enriched with fruit by-product ingredients (illustration).*

• Results and discussions

- Protein, fiber and bioactive enrichment improves nutritional value, physical properties, texture and sensory quality
- Fortified bars show higher protein, fiber, mineral and antioxidant content while keeping consumer acceptability
- By-products supply dietary fiber, polyphenols, carotenoids, vitamins and minerals
- Challenge: moisture, texture, color, flavor and stability require technological optimization

• Conclusions

Functional, sustainable and affordable fortified bars from by-products

Enhanced nutritional value and strong market potential

Less food waste, in line with circular economy principles