

# NUTRITIONAL VALORIZATION OF FERMENTED MELON BY-PRODUCTS: NOVEL SUSTAINABLE INGREDIENTS ?



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## > INTRODUCTION

Despite their typically overlooked status as by-products of melon processing, both melon peel and seeds contain valuable nutrients and bioactive compounds, presenting promising products for investigation in fermentation. [1-3]

## > AIM

To explore the feasibility and efficacy of lactic and alcoholic fermentation processes applied to melon peel, seeds and by-products, aiming to assess the potential for added-value products' development and to enhance sustainability in melon processing.

## > EXPERIMENTAL DESIGN

- During 2023, melon by-products, seeds and peels were collected in a hotel in the Lisbon region (Fig. 1A e 1B);
- After adding 2% salt (lactic fermentation) or 2% sucrose (alcoholic fermentation) of the total weight of melon by-products/seeds or peels, bags were sealed under vacuum (Fig. 1C) and maintained for 7 days at 27 °C ± 1 °C (Fig. 1D); [4]
- To remove water from formulations, samples were homogenized in a blender (Fig. 1E) and dehydrated at 55 °C for 12h (Fig. 1F);
- To obtain a flour like-product, the formulations were homogenized and sieved (Fig. 1G e 1H);

The nutritional composition was analytically determined (moisture, ash, protein, dietary fibre, fat and salt), while the energy value and carbohydrates were calculated. [5]



Figure 1. Methodological process for obtaining fermented melon by-products flours.

## > RESULTS

Six products were obtained: lactic/alcoholic fermented melon by-products flour, lactic/alcoholic fermented melon peel flour, and lactic/alcoholic fermented melon seeds flour.

### Energy:

- Lactic Fermented Melon Peel Flour = 217 kcal/909 kJ
- Lactic Fermented Melon Seeds Flour = 406 kcal/1681 kJ
- Lactic Fermented Melon by-products Flour = 246 kcal/1031 kJ
- Alcoholic Fermented Melon Peel Flour = 270 kcal/1128 kJ
- Alcoholic Fermented Melon Seeds Flour = 415 kcal/1714 kJ
- Alcoholic Fermented Melon by-products Flour = 302 kcal/1262 kJ

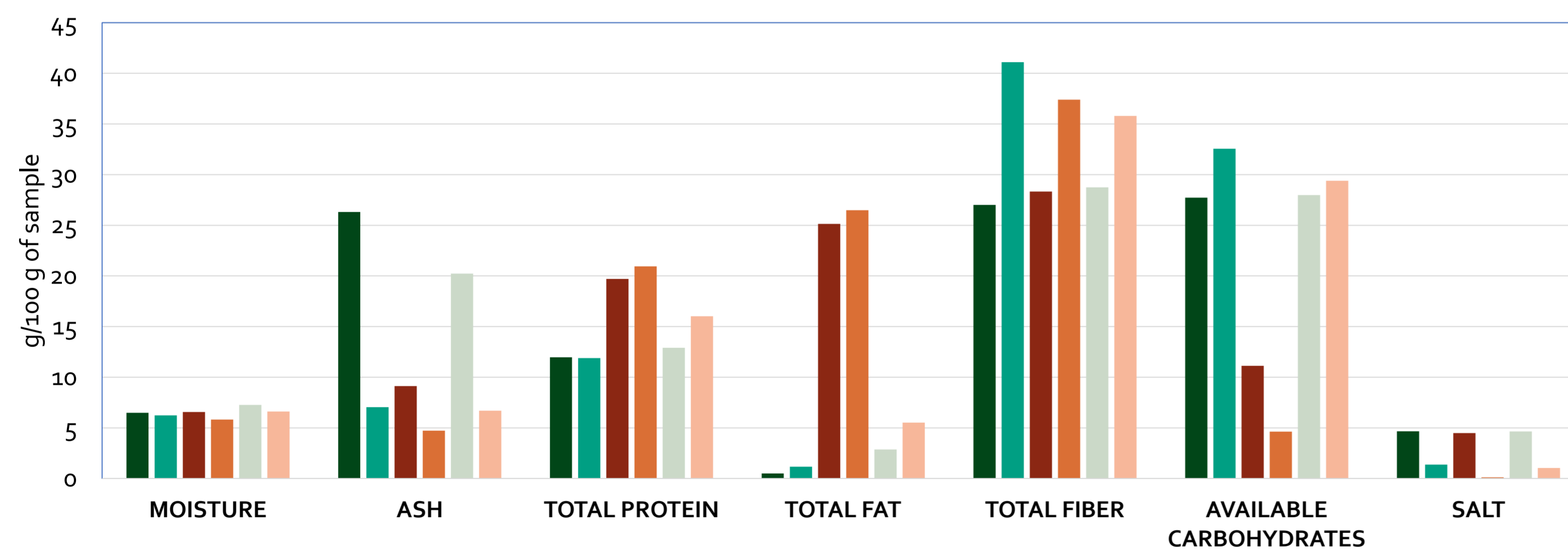


Figure 2. Nutritional composition (g/100 g of sample) of lactic/alcoholic fermented flours.

According to Regulation (EC) No 1924/2006 [6]:

- 100% of the products are rich in dietary fiber ( $\geq 6$  g/100 g) (Fig. 2);
- 83% of the products are rich in protein ( $\geq 20\%$  of energy value);
- In addition, lactic/alcoholic fermented melon peel flour has a low-fat content ( $\leq 3$  g/100 g).

## > CONCLUSION

This study highlights that low-cost processes like fermentation can achieve the benefits of waste reduction and added-value product development, contributing to sustainability in melon processing and the design of novel functional food ingredients.

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## FUNDING

This work was financially supported by Foundation for Science and Technology (FCT) under the project Food4DiAB (EXPL/BAA-AGR/1382/2021); and UIDB/50006/2020 DOI 10.54499/UIDB/50006/2020, UIDP/50006/2020 DOI 10.54499/UIDP/50006/2020, LA/P/0008/2020 DOI 10.54499/LA/P/0008/2020.