Development of a new Beetroot Snack - Impact of Pulsed Electric Fields (PEF) pretreatment on the Physicochemical and Bioactive Properties

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Dare 2 Change

Food Development & Production

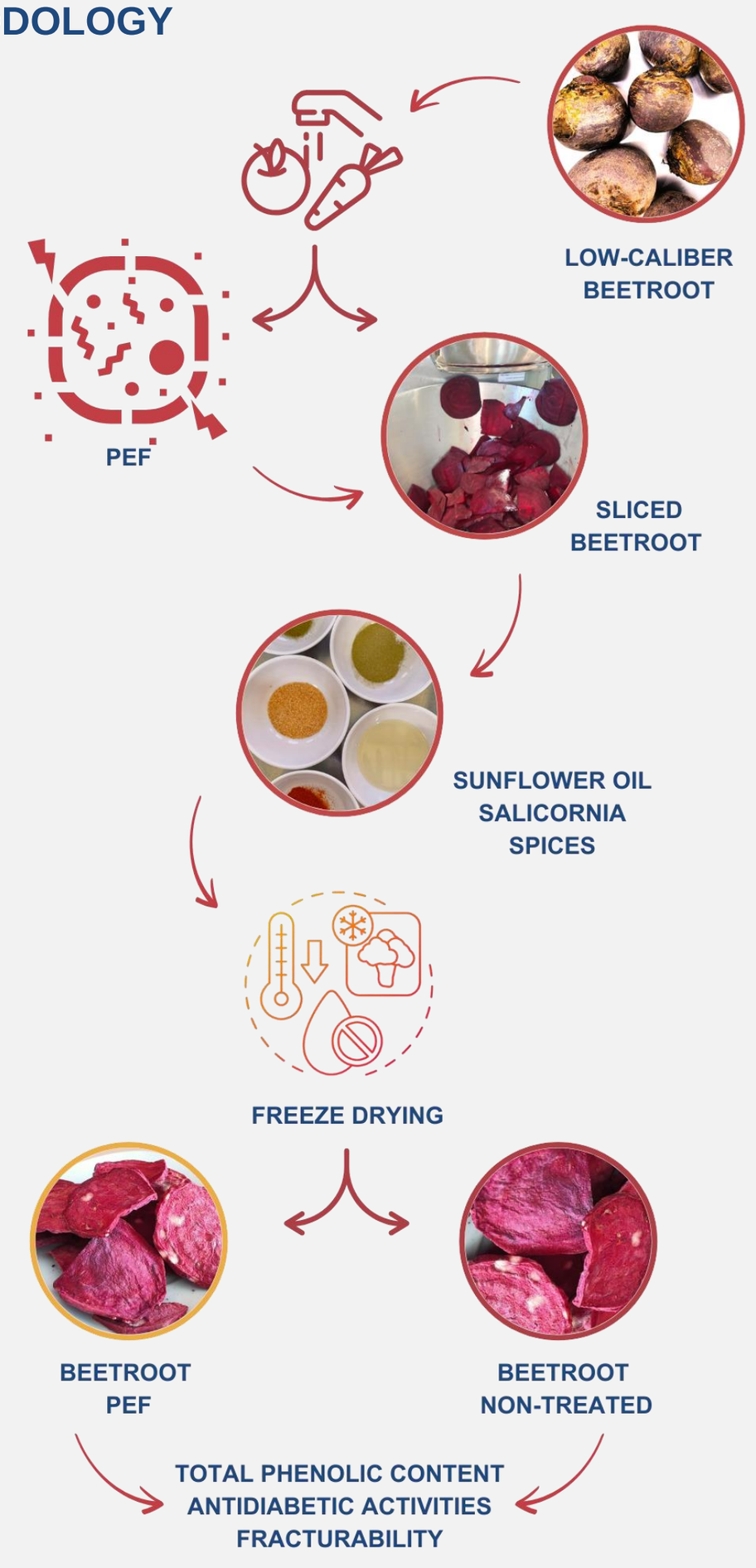
INTRODUCTION

Low-caliber vegetables are used to produce juices, flours and dried snacks. The valorization of non-marketable products through the development of new high value-added food products is aligned with current trends and contributes for a more sustainable and circular food sector. PEF is an emerging and promising technology with the potential to reduce freeze-drying time and improve the quality characteristics of processed fruit and vegetables [1,2].

OBJECTIVES

This study evaluated the impact of PEF pretreatment on the physicochemical and bioactive properties of a freeze-dried snack made from low-caliber beetroot.

METHODOLOGY



RESULTS

TOTAL PHENOLIC CONTENT

PEF caused an increased total phenolic content of samples.

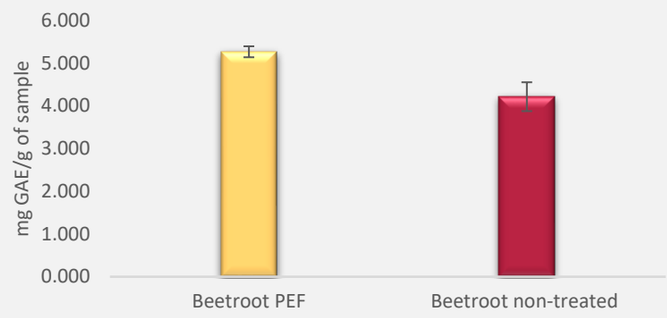


Figure 1 - Total phenolic content of beetroot samples pretreated with PEF compared with non-treated samples.

ANTIDIABETIC ACTIVITY

PEF caused an increased antidiabetic activity of samples, suggesting a beneficial potential of PEF technology in the development of snacks with functional health properties.

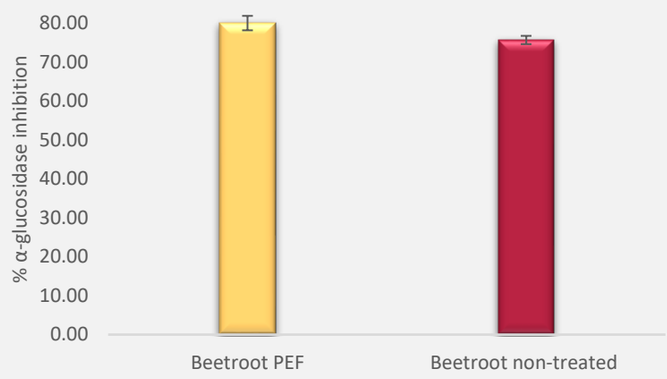


Figure 2 Antidiabetic activity of beetroot samples pretreated with PEF compared with non-treated samples.

FRACTURABILITY

Samples pretreated with PEF showed a significantly higher fracturability than non-treated samples. This indicate changes in cellular structure of the beetroot, giving the final product greater crunchiness.

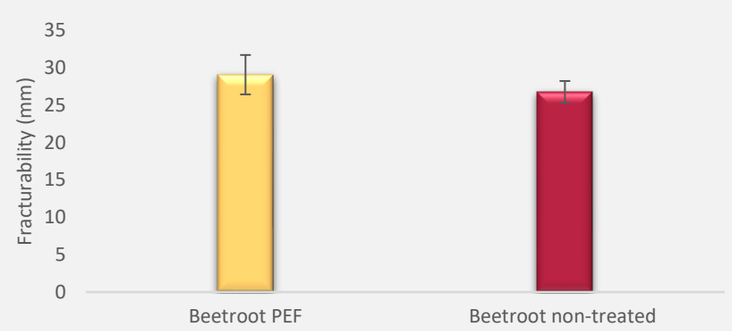


Figure 3 - Fracturability of beetroot samples pretreated with PEF compared with non-treated samples.

CONCLUSIONS

CIRCULAR ECONOMY & SUSTAINABILITY
Valorization of low-caliber and low commercial value beetroot

IMPACT OF PEF TECHNOLOGY
Improvement of the physicochemical and bioactive properties of beetroot snacks

NEW PRODUCTS
Development of new high value-added, healthier, and more sustainable food products

RESEARCH
Assessment of the impact of PEF in the freeze-drying cycle duration and cost, with a focus on the potential expansion of this technology within the food industry

References

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[2] Giancaterino, M., Werl, C., & Jaeger, H. Evaluation of the quality and stability of freeze-dried fruits and vegetables pre-treated by pulsed electric fields (PEF). LWT, 191 (2024) 115651.

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