Foods 2025 Conference
The 6th International Electronic Conference on Foods
28–30 October 2025 | Online
MDPI

Effect of Roasting Conditions on the Chemical and Functional Properties of Oat Oil

Bharani Kumar Palani[1]*, Joanna Bryś[1], Marko Obranović[2], Piotr Koczoń[1]
[1] Department of Chemistry, Institute of Food Sciences, Warsaw University of Life Sciences
[2] Department of Food Engineering, Faculty of Food Technology and Biotechnology, University of Zagreb

INTRODUCTION & AIM

- Oats (*Avena sativa*) are a nutritionally dense cereal crop. They are appreciated for their characteristic flavour and high levels of essential nutrients, particularly high-quality oil enriched with unsaturated fatty acids and antioxidants.
- This study evaluates the influence of various roasting conditions on oat oil's chemical composition and functional quality.
- Roasting, a widely used food processing method, enhances flavour and digestibility while inducing structural and compositional modifications in cereal grains.

METHODS

- Oat grains were roasted at different temperatures for 30 minutes, and the oil was extracted using Soxhlet and supercritical carbon dioxide methods. Gas Chromatography (GC) was used to analyse the fatty acid composition, and oxidative stability was measured using Pressure Differential Scanning Calorimetry (PDSC).
- Molecular-level changes in the oil were examined using Fourier Transform Infrared (FTIR) spectroscopy within the 4000–400 cm^{-1} range, followed by chemometric analysis.

CONCLUSION

Chemometric analysis revealed significant chemical differences between roasted and unroasted oat samples. The oxidative stability (OIT) of oil extracted from roasted grains was higher than that of unroasted grains, with samples roasted at 190° C exhibiting the greatest OIT value among all tested temperatures.

FUTURE WORK / REFERENCES

The data were obtained during a research internship financed by the Own Scholarship Program of the Warsaw University of Life Sciences (SGGW).

RESULTS & DISCUSSION

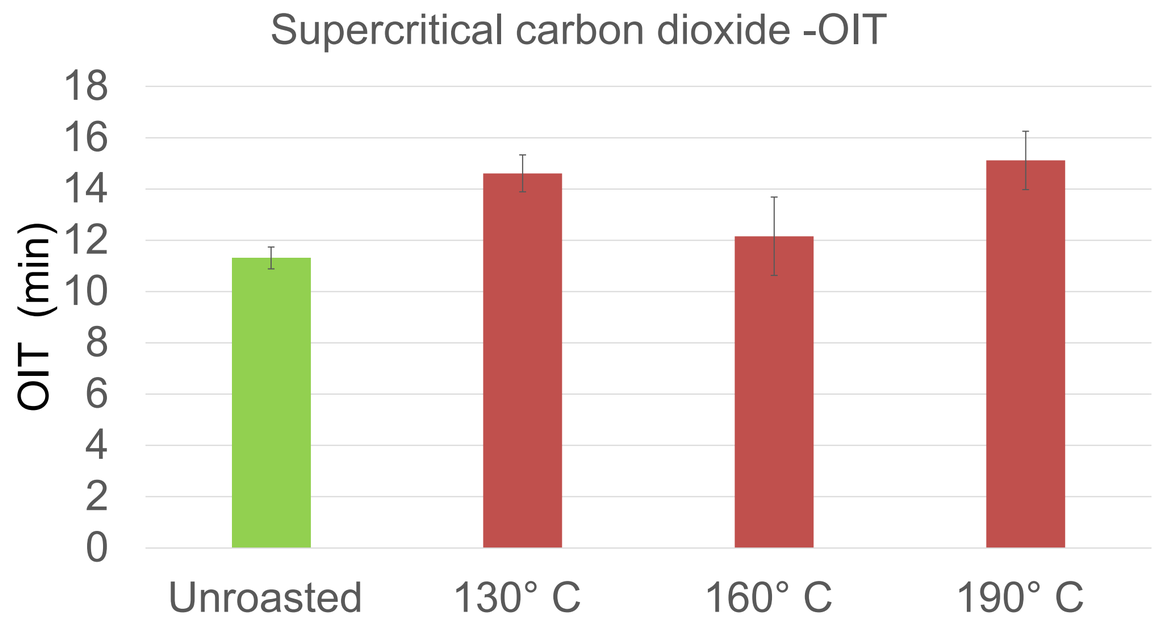

Fig. 1 Oxidation induction time (OIT) of oat oil samples.

Fig. 2 Oxidation induction time (OIT) of oat oil samples.

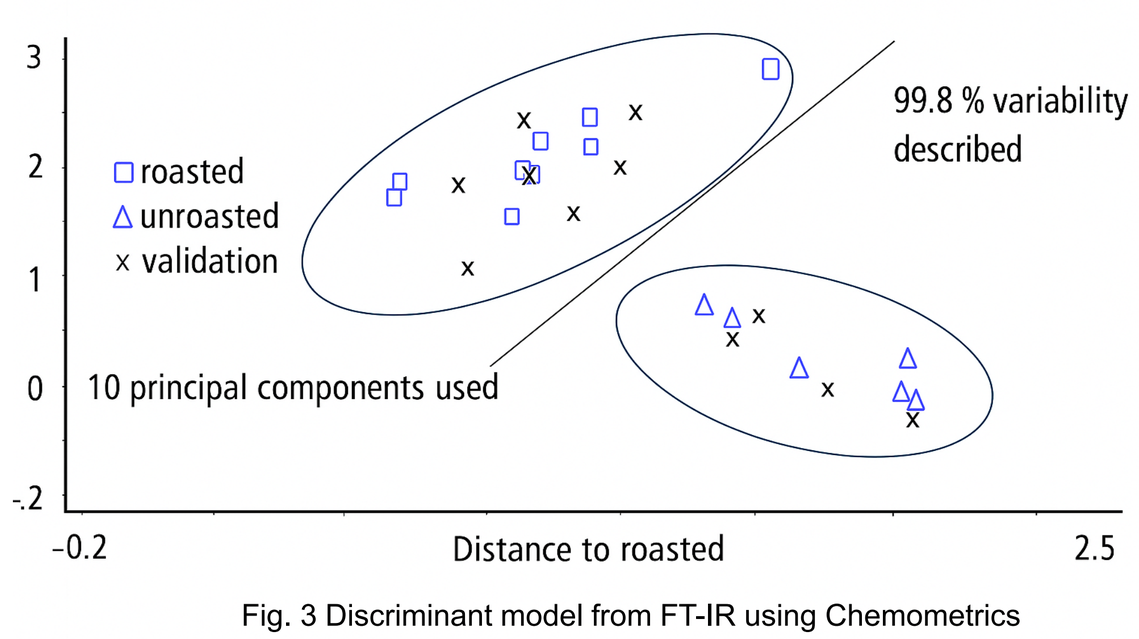

Fig. 3 Discriminant model from FT-IR using Chemometrics