



# Mineral and lipid profile of blackthorn pomace obtained under different processing conditions

Mădălina Ungureanu-Iuga<sup>1,2\*</sup>

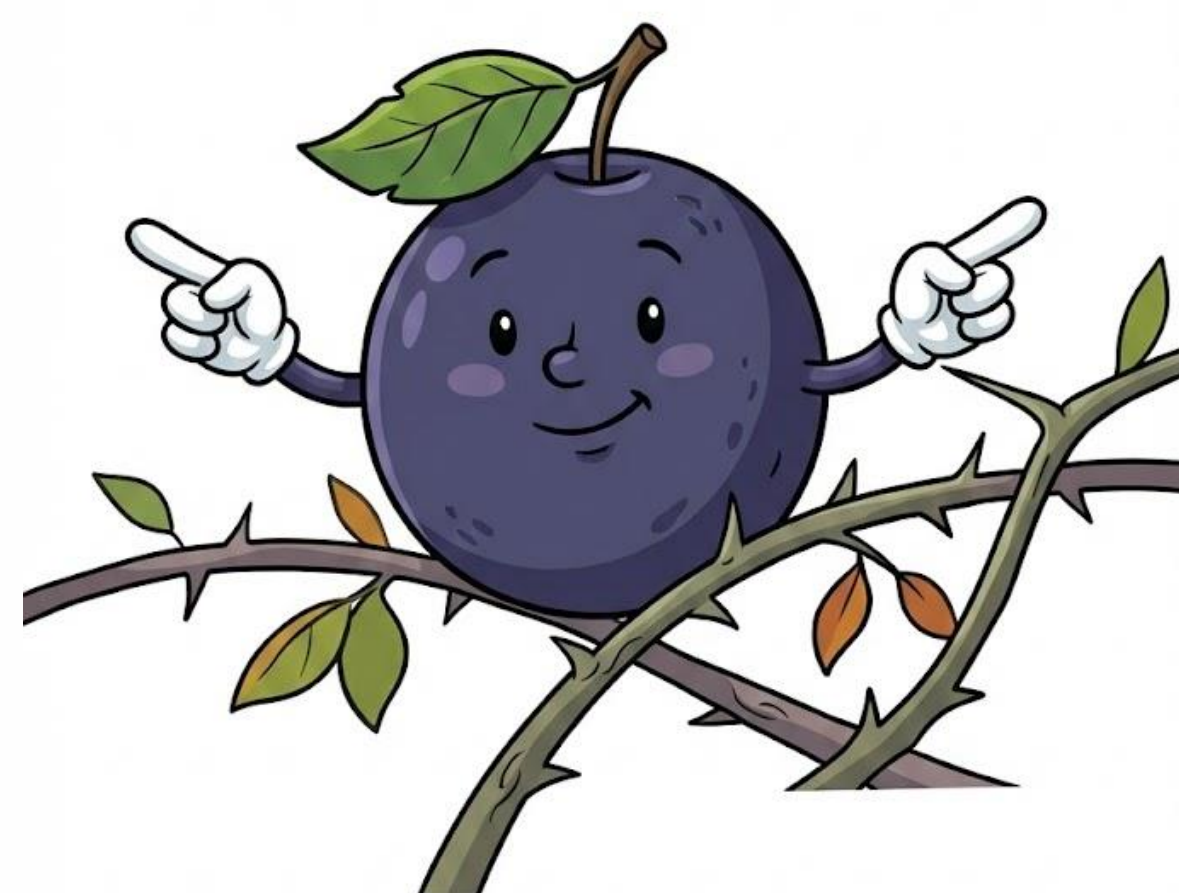
<sup>1</sup> Institute of Advanced Studies, Integrated Research, Development and Innovation Center for Advanced Materials, Nanotechnologies and Distributed Manufacturing and Control Systems (MANSiD), Ștefan cel Mare University of Suceava, Suceava, Romania

<sup>2</sup> Mountain Economy Center (CE-MONT), National Institute of Economic Research (INCE), Romanian Academy, Vatra Dornei, Romania

Presenter contact details: [madalina.iuga@usm.ro](mailto:madalina.iuga@usm.ro) , 0748360727

## Introduction

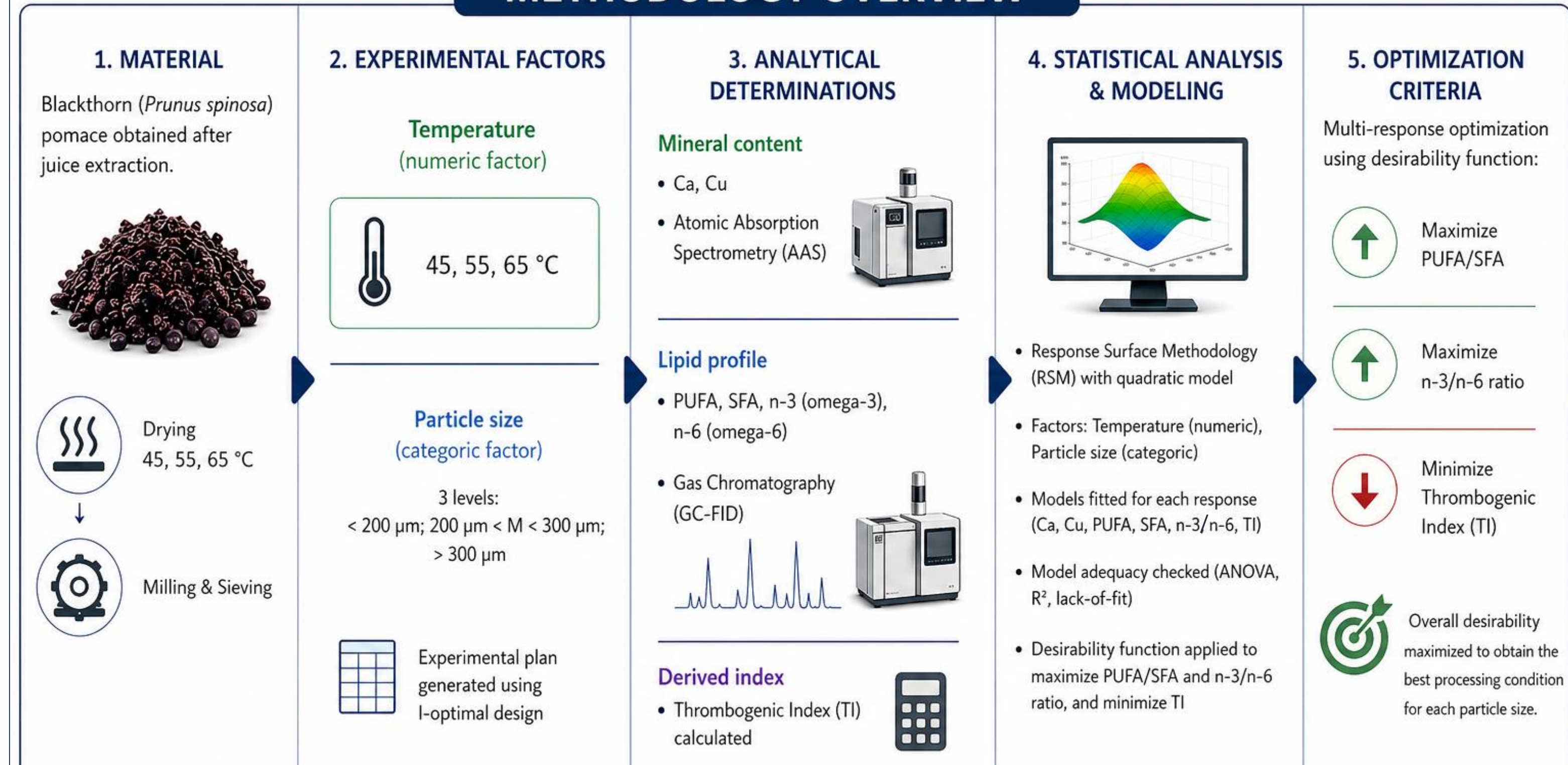
Fruit pomace valorization is an actual trend among scientists, and the demand of consumers for healthy products, along with the European direction toward waste reduction, highlights the opportunity to re-use blackthorn pomace in functional products development.



## Aim

For this purpose, conditioning of blackthorn (*Prunus spinosa*) pomace is an essential step in order to achieve the best nutritional and functional value of the ingredient. This paper aimed to evaluate the impact of drying temperature and particle on the mineral and lipid profile of blackthorn pomace.

## METHODOLOGY OVERVIEW



## Results and discussion

- ✓ Temperature effect: ↑ temperature → ↓ minerals & PUFA/SFA; ↑ n-3/n-6 and TI (up to a point).
- ✓ Optimal temperature (S, <200 μm): 50.82 °C.
- ✓ Optimal temperature (M, 200–300 μm): 50.18 °C.
- ✓ Optimal temperature (L, >300 μm): 45.45 °C.
- ✓ Higher drying temperatures reduce nutritional quality → decrease in minerals and PUFA/SFA due to thermal degradation and lipid oxidation [1,2].
- ✓ Lipid balance shifts with temperature → n-3/n-6 ratio and TI increase as unsaturated fatty acids degrade unevenly [2].

Table 1. REML (Restricted Maximum Likelihood) analysis - Kenward-Roger p-values, and model evaluation

Factor	Ca	Cu	PUFA/SFA	n3/n6	TI
Whole-plot	<0.01	<0.01	<0.01	<0.01	0.30
a-Temperature	0.17	<0.01	<0.01	0.17	0.16
a <sup>2</sup>	<0.01	0.63	<0.01	<0.01	0.51
Subplot	<0.01	<0.01	<0.01	0.01	<0.01
B-Particle size	<0.01	<0.01	<0.01	0.43	<0.01
aB	<0.01	<0.01	0.01	0.01	<0.01
Model evaluation					
R <sup>2</sup>	0.94	0.88	0.92	0.74	0.95
Adj. R <sup>2</sup>	0.92	0.82	0.88	0.63	0.92

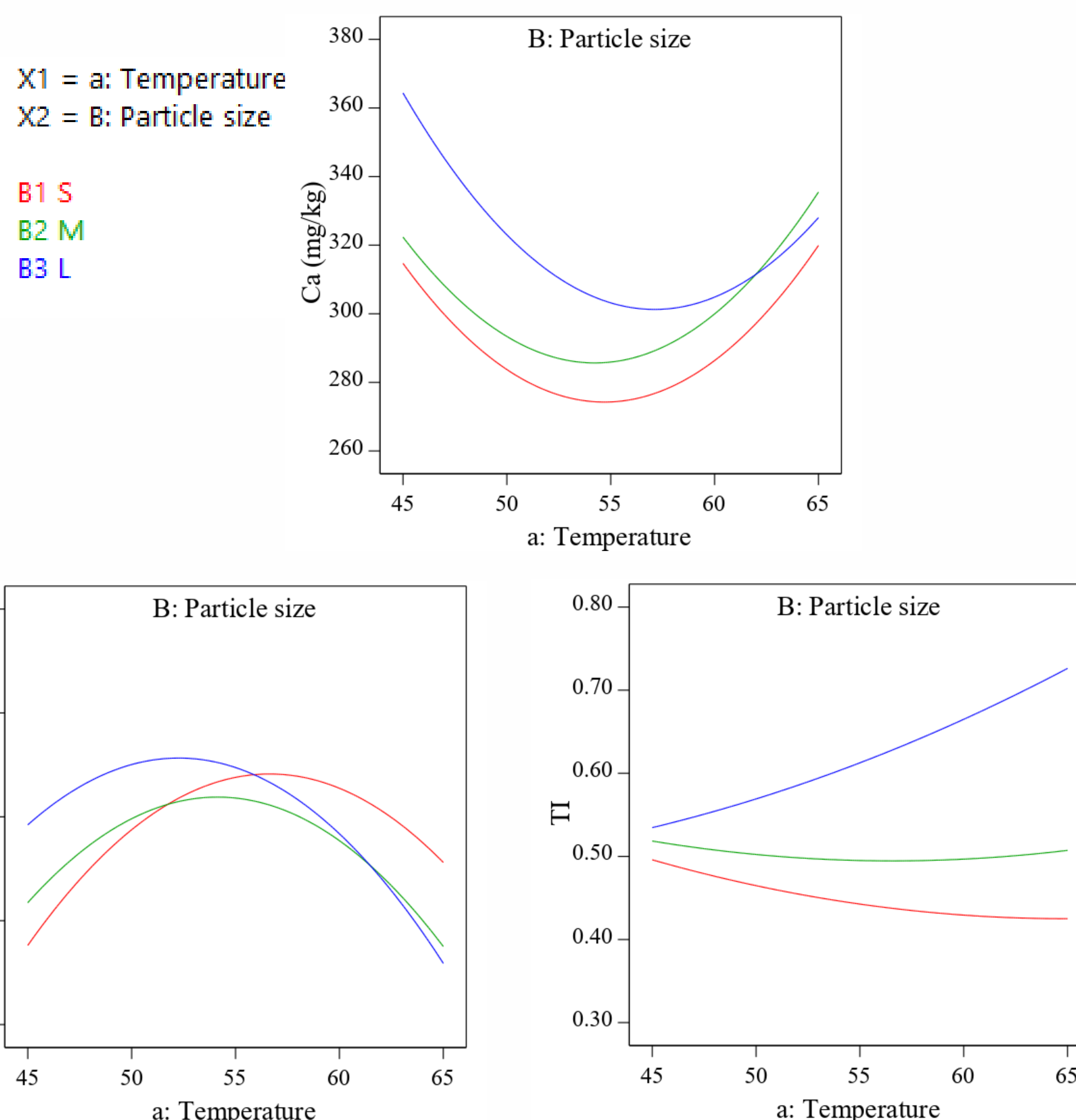


Figure 1. Effect of factors on blackthorn powder characteristics

Table 2. Optimal solution for each particle size

Solution	Temperature (°C)	Particle size	Ca (mg/kg)	Cu (mg/kg)	PUFA/SFA	n3/n6	TI
S1	50.82	S	280.73	6.43	0.48	0.30	0.46
S2	50.18	M	292.73	7.02	0.44	0.30	0.50
S3	45.45	L	359.76	7.07	0.38	0.30	0.54

## Conclusion

These results highlight the possibility to use blackthorn pomace for further applications in food industry due to its high nutritional value. The selection of the best processing conditions depends on the final destination of the ingredient proposed.

## References

- [1] Islam, F. et al. (2023). Functional roles and novel tools for improving-oxidative stability of polyunsaturated fatty acids: A comprehensive review. *Food Science & Nutrition*, 11, 2471–2482.
- [2] Wang, D., Xiao, H., Lyu, X., Chen, H., & Wei, F. (2023). Lipid oxidation in food science and nutritional health: A comprehensive review. *Oil Crop Science*, 8(1), 35-44.
- [3] Gharby, S., et al. (2025). Vegetable oil oxidation: Mechanisms, impacts on quality, and approaches to enhance shelf life. *Food chemistry: X*, 28, 102541.