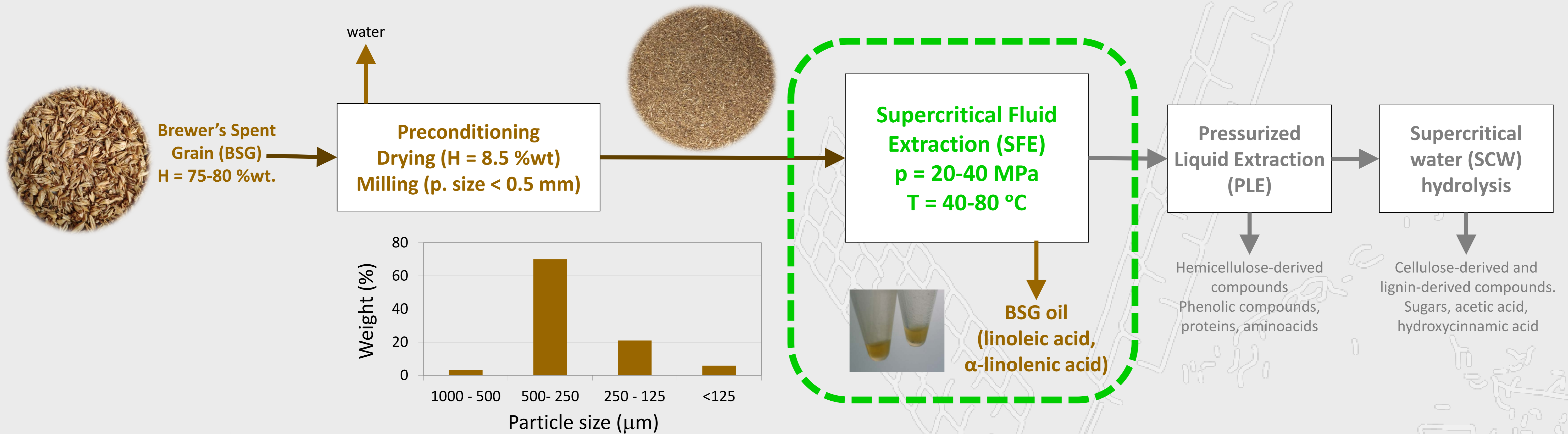


Biorefinery approach to the extraction of bioactive compounds from Brewer's Spent Grain (BSG)

Patricia Alonso-Riaño, Rodrigo Melgosa, María Teresa Sanz, Óscar Benito-Román, Sagrario Beltrán

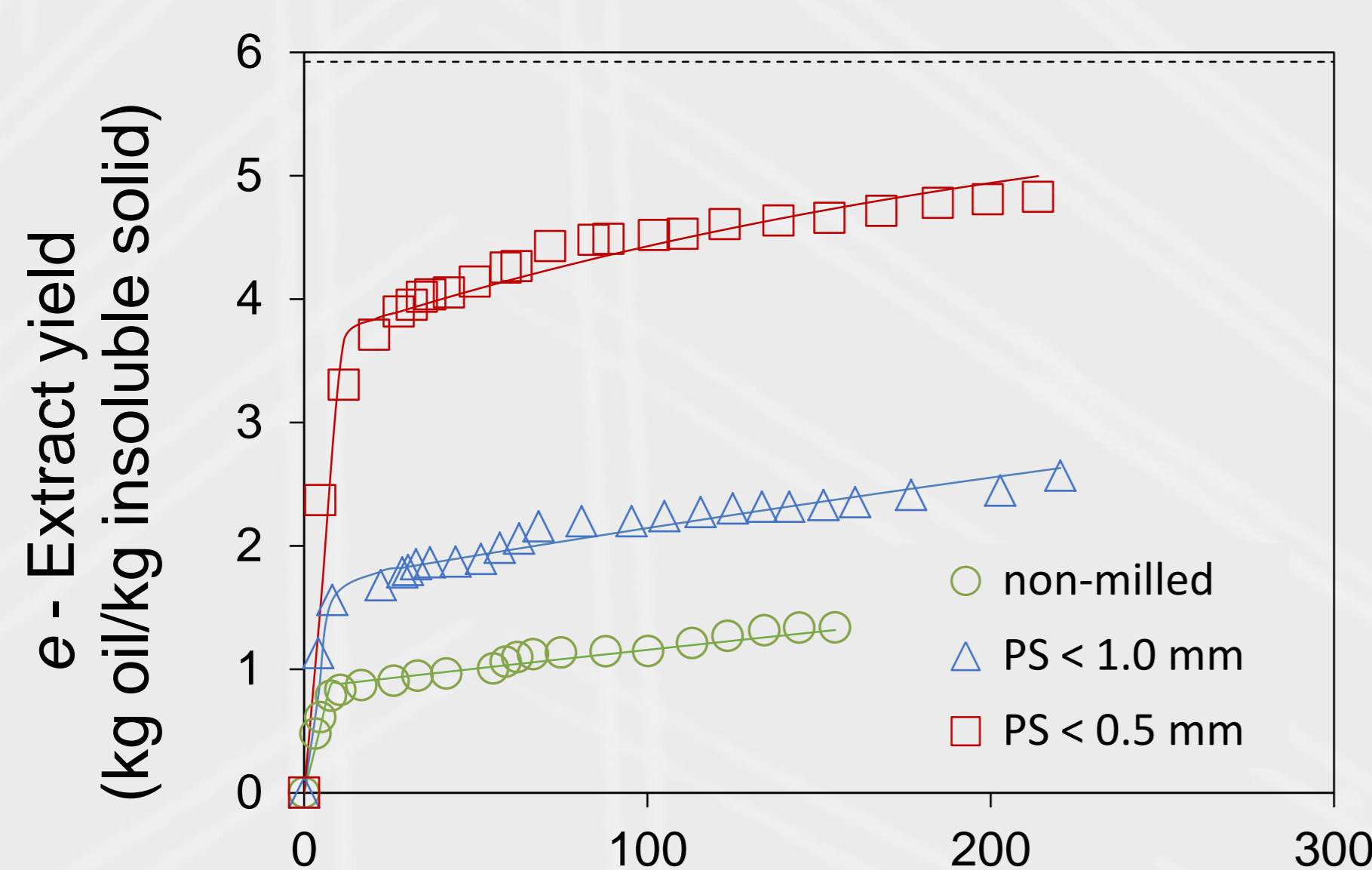
University of Burgos, Department of Biotechnology and Food Science. Chemical Engineering Division
Pza. Misael Bañuelos s/n 09001 Burgos (Spain). beltran@ubu.es

Flow diagram for integral Brewer's Spent Grain (BSG) valorization

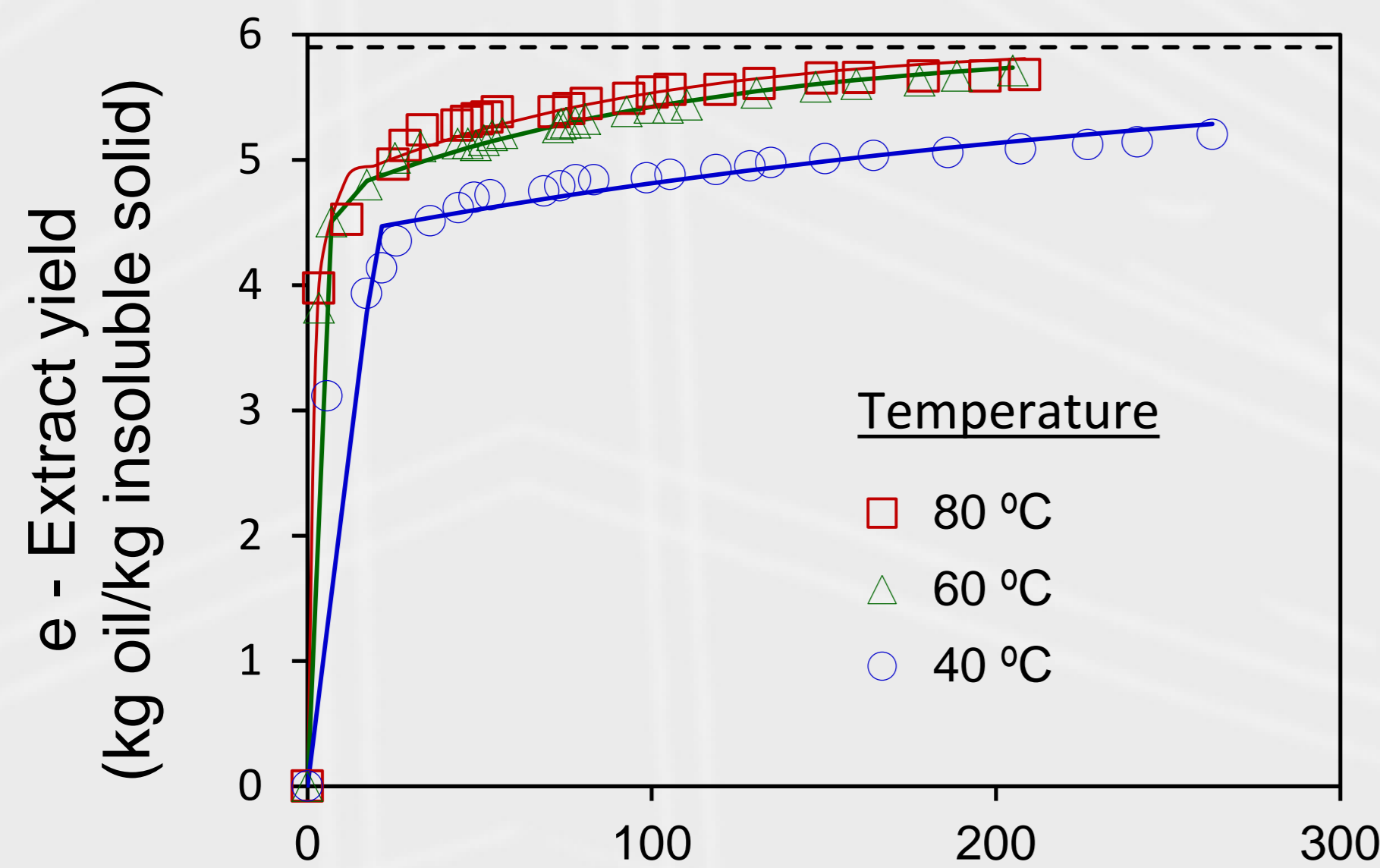


Characterization of scCO₂ extracted BSG oil

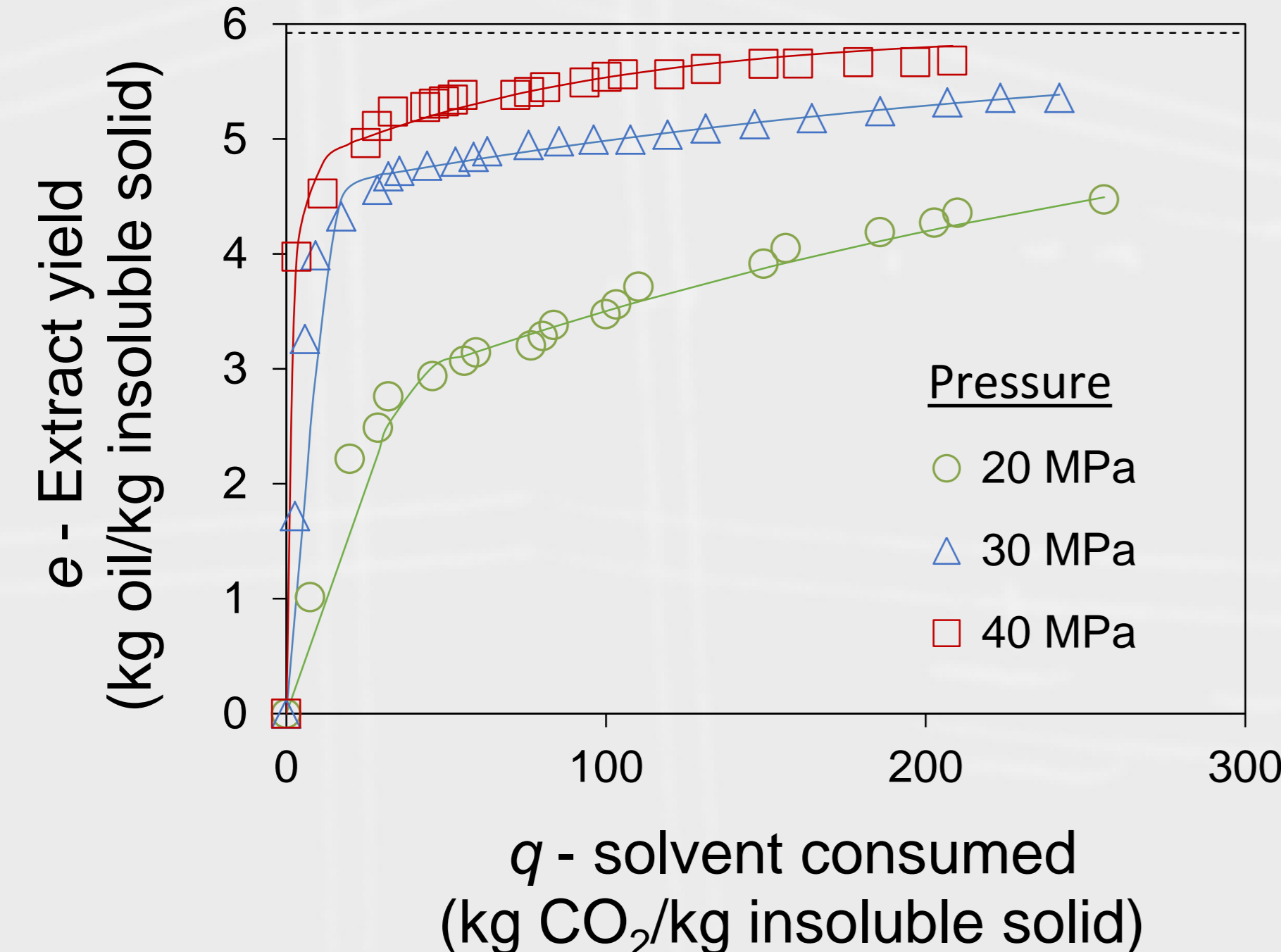
Supercritical CO₂ extraction of BSG. Extraction curves and modelling



Effect of particle size (PS) on SFE of BSG at 30 MPa and 40 °C.

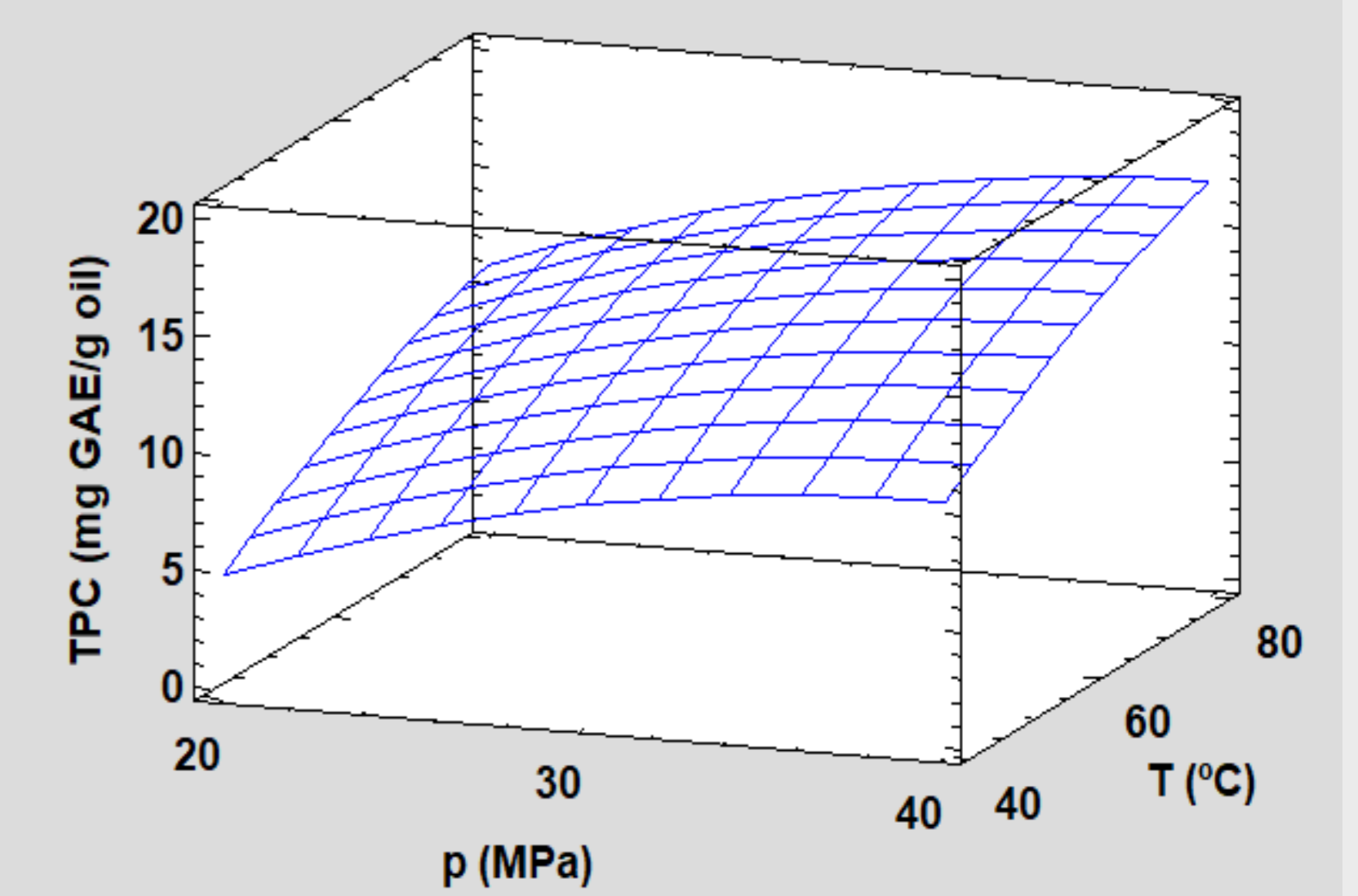


Effect of temperature on SFE of BSG at 40 MPa.

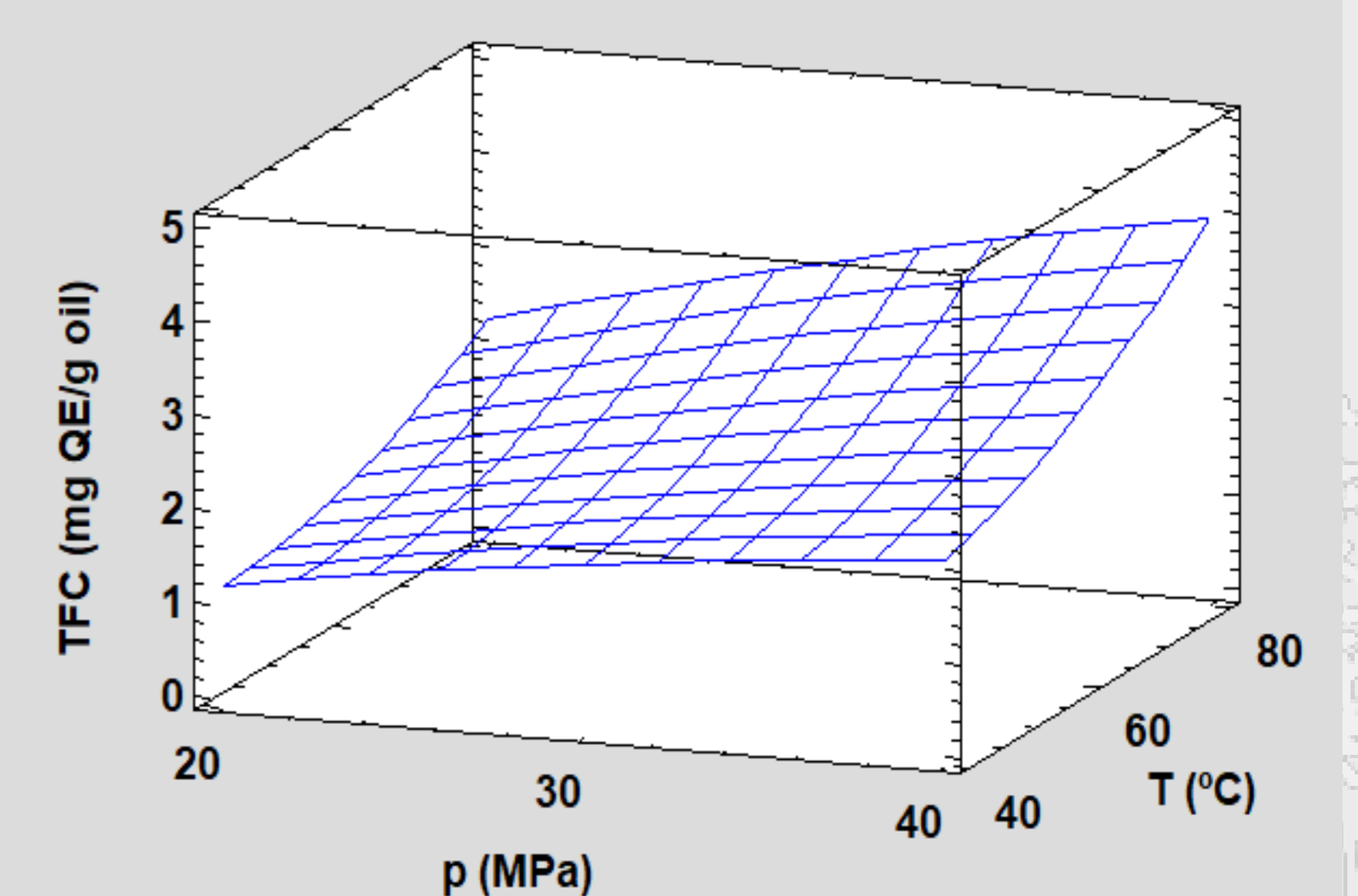


Effect of pressure on the SFE of BSG at 80 °C.

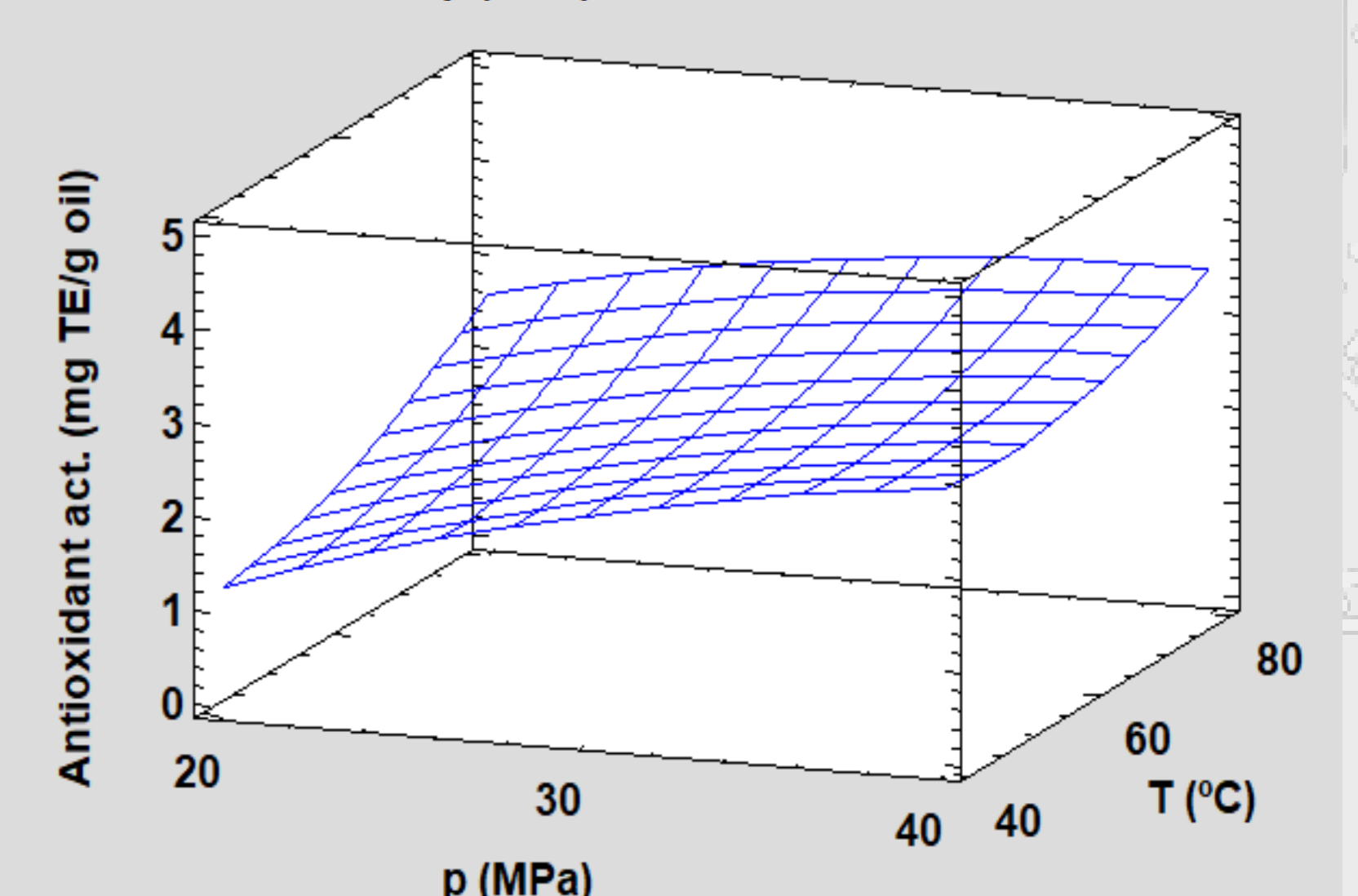
Effect of pressure (p) and temperature (T) on Total Phenolic Content (TPC), of the SFE extracts



Effect of pressure (p) and temperature (T) on Total Flavonoid Content (TFC) of the SFE extracts



Effect of pressure (p) and temperature (T) on antioxidant activity of the SFE extracts



Functional quality of scCO₂ extracted BGS oil

SFE Temperature (°C)	40 °C			60			80		
SFE Pressure (MPa)	20	30	40	20	30	40	20	30	40
PUFA/SFA*	2.04	2.22	2.08	2.22	2.11	2.04	2.03	2.00	1.99
H/H*	2.81	3.13	2.87	3.07	2.92	2.82	2.81	2.76	2.77
AI*	0.35	0.31	0.34	0.32	0.34	0.35	0.35	0.36	0.36
TI*	0.55	0.49	0.54	0.51	0.53	0.55	0.56	0.56	0.56

* PUFA/SFA: Ratio of polyunsaturated/saturated fatty acids. H/H: Hypocholesterolemic/hypercholesterolemic Index. AI: Atherogenicity index. TI: Thrombogenicity index

Continuous lines represent the fitting of Sovová's Model

Acknowledgements

- To JCyL and ERDF for financial support of project BU301P18
- To Hiperbaric, S.A. for financial support of Project BIOLIGNO
- To JCyL and ESF for E. Trigueros predoctoral contract and for the contracts of P. Alonso-Riaño, Sarai del Rio Melgosa and Maria Berzal Lorenzo through the YEI program