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EVALUATION OF EXTRUSION EFFECTS ON ANTIOXIDANT ACTIVITY AND TOTAL PHENOLICS COMPOUNDS IN THE SHELL WALNUT

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The compounds oxidation found in food, as in the case of lipids, decreases the nutritional value and affects the products organoleptic characteristics. Phenolic compounds are a good option to prevent this negative effect. High temperatures usually causes loss of phenolics compounds, while the mechanical effect of extrusion is helpful for releasing bound phenolics from the food matrix and induced antioxidant activities. On the other hand, the high content of fiber in the shell of walnuts can be useful as prebiotic or as a filter compound in the industry. Different extrusion temperatures (33.25, 40, 70, 100 and 106.75°C) and different screw speeds (88.75, 100, 150, 200 and 211 rpm) were analyzed using response surface methodology (RSM) to investigate changes in dietary fiber (soluble and insoluble) contents, oil and water absorption, water solubility, phytochemical contents and antioxidant activity of extrusion products of walnut shell. The results showed that the total dietary fiber extraction was increased, in the best conditions, around 6%. The extrusion process no affected the insoluble and soluble fraction. With 70°C and 150 rpm, the total phenolic content (TPC) reached their peak and increased when compared with the control test. Antioxidant activity occurred at higher levels in the range from 70°C to 100°C and 150 to 200

rpm. In colour, the three parameters measured, L* (lightness), a* (greenness-redness), and b* (blueness-yellowness); these were significantly affected ($p < 0.05$) by the process temperature and screw speed. Water and oil absorption capacity increased with the extrusion process. These results demonstrated the potential that the shell walnut extrusion has for the creation of new functional products for animals and preservative in the food industry.

Biography

María Pilar Almajano has completed her PhD in Organic Chemistry in the CSIC and postdoctoral studies in Reading University (UK). She has been working on the topic of natural antioxidants for more than 15 years. She has around 60 scientific publications in international journals. Since 2007 she is working at the School of Engineering in the UPC, teaching Chemistry and Food Technology. Juliana Villasante is a PhD student in natural antioxidants. She has completed his degree in Engineering in Food Industry by "Instituto Tecnológico y de Estudios Superiores de Monterrey" and master in Food Research, Development and Innovation by Universidad de Barcelona. She has worked in the departments of Development and Innovation in different food industries.

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