



Title: Application of Extrusion-cooking to Valorize Fruit Pomace as a Valuable By-product

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Abstract:

Fruit pomace valorization by extrusion-cooking is a promising food processing method that allows the transformation of by-products from juice production into ingredients with high nutritional and functional value. Pomace, as the material left after pressing the juice, still contains significant amounts of dietary fiber, polyphenols, vitamins, minerals. Exposing them to high temperature and pressure in the extrusion-cooking process leads to significant physical, structural and chemical changes, as well as the inactivation of microorganisms and improvement of microbiological stability. Furthermore, the extrusion-cooking process can significantly improve the texture and functional properties of the final product, making it easier to use in various food products.

The aim of the study was to assess the physicochemical properties of chokeberry fruit pomace subjected to the extrusion process directly after juice pressing, without additional pre-treatment. Extrusion-cooking was carried out with a single screw extruder under various conditions to assess the effect of the process on the physicochemical characteristics of the pomace as a potential additive for use in various food products. Variable screw speeds (80, 100, 120 rpm) and die temperatures (60, 80, 100°C) were applied. The extrudates were assessed for their color profile, bulk density, water absorption and solubility index. The results showed that extrusion carried out under variable process parameters had significant effect on functional

properties. Both BD, WAI and WSI showed a decreasing trend with increasing temperature. The values obtained indicate that aronia pomace extrudates can be used in products requiring hydration to modify viscosity or hydration. The two-factor analysis of variance indicated a significant effect of screw speed on the lightness of the extrudates, but redness and yellowness were most strongly influenced by temperature.

In summary, extruded chokeberry pomace showed great potential as a by-product of high functional value, and has the potential to be used in sustainable food production. This could be valuable ingredient in innovative food products aimed at reducing losses in the food industry and promoting health due to its favorable fiber profile, valuable fatty acid content and antioxidant potential. Direct extrusion-cooking of fruit by-products is an interesting alternative to fruit waste processing, in line with the principles of sustainable development.

Biography

Prof. dr hab. Agnieszka Wójtowicz, head of the Department of Food Process Engineering, is busy with application of extrusion-cooking in the processing of functional foods and additives, pasta and snacks, and biopolymers. She is the author and co-author of over 330 scientific papers and conference materials, several patents and 3 books.