

Polyphenols and dietary fibre from berry pomace (*Aronia melanocarpa*) obtained by High-pressure high-temperature extraction (HPHT)

E. Mayer-Miebach, D. Behsnilian, R. Greiner

Max Rubner-Institute (MRI), Department of Food Technology and Bioprocess Engineering

Over one third of the raw material needed for fruit and vegetable juice production is wasted, mainly as pomace, a processing by-product rich in bioactive compounds, e.g. polyphenols (PP) and dietary fibres (DF). Many PP are very strongly associated with plant cell walls being their bioavailability often quite low. Furthermore, frequent consumption of carbohydrate-rich food with a high glycemic index seems to increase the risk for obesity, type 2 diabetes, and other metabolic disorders e.g. cardiovascular diseases, certain forms of cancers. Consumption of functional food enriched with high contents of specific types of DF and PP and reduced energy density may lower these risks.

Our aim is to investigate whether a novel extraction technique, the water-based high-temperature high- pressure extraction (HPHT), will be suitable to produce pomace extracts with high contents of bioactive PP and DF to be used as food ingredients.

The HPHT extraction was studied in a temperature range of 100 - 200 °C (up to 16 bar) using pure subcritical water as the extracting agent, thus avoiding organic solvents. As a model substance, the pomace from an industrial chokeberry juice production line was used. Nutritional quality parameters, e.g. DF (AOAC 2011.25), PP and sugars were analysed.

Promising first results show, that the PP contents of HPHT extracts depend on (1) the ratio of pomace mass to the extraction volume, (2) the extraction temperature and (3) time. The highest PP contents achievable are about 60% higher as compared to analytical extracts (80% methanol, 20% water) at 25 °C. Even anthocyanins as thermally sensitive PP are preserved under these conditions up to about 70%, with a ratio of monomers of about 85%.

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