

# VALORIZATION OF BILBERRY POMACE AS A FUNCTIONAL INGREDIENT FOR NUTRITIONALLY ENHANCED WHEATBREAD

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Bilberries are widely appreciated for their high levels of dietary fiber and bioactive compounds, particularly phenolics and anthocyanins. Because of their short shelf life, a large portion of the harvest is processed into juices, beverages, and other products, generating significant amounts of pomace composed of skins, seeds, and pulp. Although often treated as waste, this by-product contains valuable nutrients and antioxidant compounds, making it a promising raw material for the development of functional foods.

The aim of this study was to assess the potential of bilberry (*Vaccinium myrtillus* L.) pomace as a functional ingredient in wheat bread and to evaluate its effects on technological and antioxidant properties. Two types of pomace were investigated: defatted pomace obtained after juice pressing and puree production, and non-defatted pomace obtained after puree production. These materials were incorporated into French-style wheat bread by replacing 5%, 7.5%, and 10% of wheat flour. Bread quality was evaluated based on loaf volume, weight, crumb porosity, and moisture content, while antioxidant activity was determined using the QUENCHER method (TPC, ABTS•+).

The incorporation of bilberry pomace significantly affected both the technological and nutritional characteristics of the bread. Moderate levels of pomace improved loaf volume, crumb porosity, and moisture retention, resulting in higher product yield. The enriched breads exhibited a darker crumb, softer texture, and a mild berry aroma that enhanced sensory properties. The most favorable quality parameters were observed in breads supplemented with 5% and 7.5% non-defatted pomace. In contrast, the addition of 10% pomace led to reduced loaf volume and crumb porosity, as well as excessive moisture, indicating that high inclusion levels may negatively affect product quality.

Pomace supplementation also increased antioxidant activity and phenolic content in the breads. The total phenolic content of the different pomace types ranged from 17.30 to 23.30 mg gallic acid equivalents (GAE)/g, with the highest values found in defatted pomace obtained after puree production.

These results demonstrate that bilberry pomace can serve as a valuable source of dietary fiber and antioxidant compounds in bakery applications. Its incorporation into wheat bread enhances nutritional value while maintaining acceptable technological and sensory properties, supporting its use in the development of functional, high value-added bakery products.