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Potatoes as a versatile food ingredient: nutritional value and technological applications

Maria-Laura Dosan[1], Beatrix-Georgiana Bodiu[1], Andreea Ghitulescu[1,2], Diana Moigradean[1], Mariana-Atena Poiana[1,*]

[1] *Faculty of Food Engineering, University of Life Sciences “King Mihai I” from Timisoara, Aradului Street No 119, 300645 Timisoara, Romania*

[2] *Doctoral School “Engineering of Plant and Animal Resources”, University of Life Sciences “King Mihai I” from Timisoara, Aradului Street No. 119, 300645 Timisoara, Romania*

[*] *Corresponding author: marianapoiana@usvt.ro*

Abstract:

Potatoes are valuable food ingredients due to their nutritional composition and technological properties. They provide carbohydrates, particularly starch, dietary fiber, vitamins (C, B6, and K), minerals (potassium and magnesium), and bioactive compounds, including chlorogenic acid and quercetin. These components contribute to antioxidant activity, cardiovascular and immune health, and digestive function.Potato starch plays an important role in water absorption, gelatinization, thickening, and texture formation. In bakery products, potato-derived ingredients improve moisture retention and softness, while in frozen products they help maintain texture and reduce water loss. In gluten-free formulations, they enhance structure and volume, whereas in dairy products and desserts, potato starch acts as a thickening and stabilizing agent.Overall, potatoes offer nutritional and technological benefits, supporting the development of innovative food products with improved texture, sensory characteristics, and overall quality.

• Introduction

Potatoes are an important source of carbohydrates, particularly starch, dietary fiber, vitamins (C, B6, and K), and minerals such as magnesium and potassium.

Potatoes also contain bioactive compounds, including polyphenols (chlorogenic acid) and flavonoids (quercetin), which contribute to their antioxidant activity. These compounds may help reduce inflammation and support cardiovascular health, while potassium contributes to maintaining normal blood pressure and vitamin C supports immune function.

Additionally, potatoes contain resistant starch, which can promote the growth of beneficial gut bacteria, support digestive health, and contribute to glycemic regulation. Due to their nutritional composition and functional properties, potatoes (Figure 1) represent valuable raw materials for the development of food products with improved quality attributes.

Keywords: *food applications; functional properties; innovative food products; nutritional composition; potatoes*

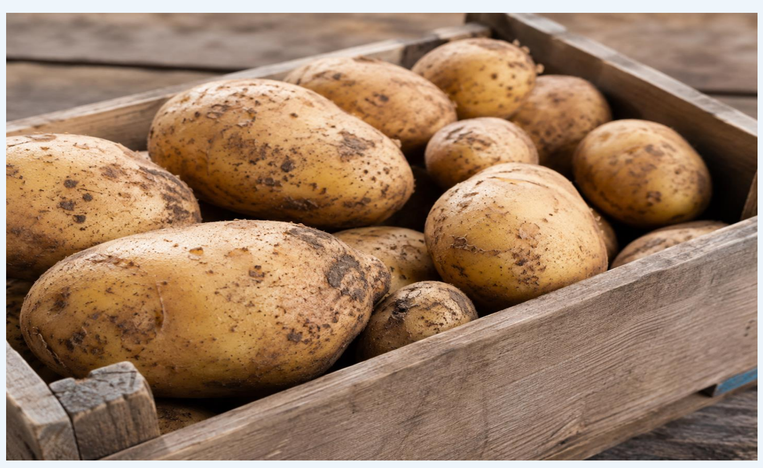


Figure 1. Potato tubers (*Solanum tuberosum* L.).

• Results and discussions

Starch plays an important role in water absorption, gelatinization, thickening, and texture formation, contributing to the stability and consistency of various food formulations.

In bakery products and pastries, potato-derived ingredients can improve moisture retention, provide a softer texture, and reduce product drying during storage.

In frozen products, such as vegetable nuggets, they help maintain texture and reduce water loss after thawing.

In gluten-free products, they can improve structure, volume, and textural properties, contributing to the development of products with improved consumer acceptability.

In dairy products and desserts (Figure 2), potato starch can act as a thickening and stabilizing agent, providing a smooth and creamy consistency.



Figure 2. Potato ice cream

• Conclusions

Potatoes are versatile and valuable ingredients with multiple nutritional and technological benefits. Their incorporation can improve nutritional value, texture, sensory properties, and overall product quality. Furthermore, the versatility of potatoes allows their use in developing innovative food formulations that respond to consumer demand for diversified and nutritionally balanced food products.