

Jostaberry (*Ribes* × *nidigrolaria*) and 3D Printing: Unlocking New Opportunities for Personalized, Health-Promoting Desserts

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Jostaberry (*Ribes* × *nidigrolaria*) is a hybrid fruit that combines the characteristics of blackcurrant and gooseberry, offering high levels of vitamin C, anthocyanins, and other antioxidants that support immune health and reduce oxidative stress. Its functional potential includes anti-inflammatory, antimicrobial, and cardiovascular benefits, making it valuable for use in functional foods and nutraceuticals. Due to its tangy-sweet flavor and nutrient density, jostaberry can be consumed fresh, processed into jams and juices, or used as a natural ingredient in health-promoting food products.

In recent years, consumers have increasingly sought novel foods that provide high biological, nutritional, and sensory value. 3D food printing presents an innovative solution by enabling the creation of personalized, nutrient-rich, and visually appealing food products that align with modern dietary preferences. By controlling ingredient distribution at a microscale, 3D printing enhances the bioavailability of vitamins, antioxidants, and fibers from fruits. Additionally, it promotes sustainable food production by utilizing surplus fruit and reducing food waste through tailored portioning and personalized nutrition solutions.

The aim of this study was to determine the potential of jostaberry fruit for producing 3D-printed desserts. 3D printing of fruit purée was performed using wheat or corn starches with a 3D extrusion printer, and in all samples, physicochemical, biological, and antioxidant properties were monitored over a 12-day shelf life in darkness at 4 °C. The results showed that storage did not negatively affect the content of total phenolic compounds, hydroxycinnamic acids, or flavonols. In contrast, levels of monomeric anthocyanins and condensed tannins slightly decreased during storage, as confirmed by the reduced total color difference between the fruit and the 3D-printed desserts. Although the antioxidant potential declined over time, the 3D-printed desserts still exhibited good antioxidant capacity. When assessing the influence of added starches, it was concluded that desserts with corn starch better preserved the stability of all tested compounds.

In conclusion, jostaberry shows great potential for developing novel functional foods through 3D printing technology, meeting consumer demands for innovative, sustainable, nutritious, and biologically active snacks with promising antioxidant potential.

Key words: Jostaberry; functional food; 3D printing; bioactive potential; antioxidant capacity

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