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Unlocking the potential of Dragon Fruit: Physicochemical, nutritional and functional properties of bioactive materials

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Abstract

Dragon fruit (*Hylocereus polyrhizus*), also known as pitaya, is a popular tropical fruit known for its vibrant color, unique appearance, and potential health benefits. Although they are perishable under ambient condition, dragon fruit has a good future in the food industry as a functional food as well as a natural food colorant. The present study explores the spray drying process as a promising technique for preserving and transforming dragon fruit into a convenient and stable powdered form. The aim of this research is to investigate the effects of various spray drying parameters, such as inlet temperature, concentration of maltodextrin, feed concentration, and drying aids, on the physicochemical and sensory properties of dragon fruit powder. The study reveals that spray drying effectively reduces the moisture content of dragon fruit while retaining its essential nutrients and vibrant color. Optimal conditions for spray drying are determined, leading to the production of high-quality dragon fruit powder with desirable characteristics for various applications, including the food, beverage, and pharmaceutical industries. Furthermore, the study evaluates the shelf-life stability and reconstitution properties of the dragon fruit powder, providing insights into its potential commercial viability. The findings contribute to the development of innovative methods for preserving dragon fruit and expanding its utilization in a broader range of products, ultimately promoting sustainable agribusiness practices and enhancing consumer access to this exotic fruit.

Keywords: Pitaya, functional food, spray drying, betacyanin, sustainable agribusiness