

Title Freeze drying of plant products: where we are and where we are heading to
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Abstract

Purpose of review: Freeze drying has always been recognised as an expensive process with high-quality end products. This article reviews the latest research on freeze drying of plant products (i.e., vegetables, fruits and herbs) and its application to conserve the functional compounds of plant materials.

Findings: Research shows that freezing is a better method than freeze drying for the retention of key bioactive compounds. However, when compared with other dehydration methods, freeze drying is still the best process for producing functional powders. In recent years, hybrid dehydration methods (i.e., hot-air drying followed by freeze drying) have been evaluated for their potential to reduce energy consumption and costs.

Directions for future research: The understanding of quality losses during processing, through the glass transition theory and by determining material microstructure, could help in the optimisation of the freeze-drying process in order to extend its application to plant products on a larger industrial scale.