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Effect of pre-treatment conditions and freeze-drying temperature on the process kinetics and physicochemical properties of pepper

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1 **Effect of pre-treatment conditions and freeze-drying temperature on the process kinetics**
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11 **Abstract**

12 This study shows the effects of blanching, citric acid addition, and drying temperature on the
13 freeze-drying kinetics, L-ascorbic acid content, colour, and antioxidant activity of freeze-dried
14 pepper. The process was performed at 20°C, 40°C, and 60°C and with a constant pressure in a
15 drying chamber at 63 Pa. The samples of pepper were pulped before drying. Blanching of
16 pepper reduced the drying time to approximately 30%. The shortest drying time (about 290
17 min) was found for blanched pepper that was freeze-dried at 60°C, whereas the samples of
18 pepper freeze-dried at 20°C and without blanching required the longest drying time (about 900
19 min). The kinetics of freeze-drying of pepper pulp are best described by using the Page model.
20 The addition of citric acid increased the redness and yellowness of dried pepper, whereas an
21 increase in drying temperature caused a decrease in the total phenolics content, antioxidant
22 activity, and colour coordinates of all samples. The highest L-ascorbic acid content was found
23 in unblanched pepper and when the temperature of drying did not exceed 40°C. Water

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