

Title Suitability of five different potato cultivars (*Solanum tuberosum L.*) to be processed as fresh-cut products

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Abstract

Five different potato cultivars ('Agata', 'Agria', 'Almera', 'Marabel' and 'Vivaldi') were cut and stored at two temperatures (5 and 20 °C) for 9 d in order to investigate their browning potential and their suitability to be processed as fresh-cut product on the basis of their initial quality attributes such as color, water content, polyphenol oxidase (PPO) and phenylalanine ammonia-lyase (PAL) activities, total phenolics, ascorbic acid contents, sugar composition and antioxidant activity (AOX). In addition, color changes and general appearance were monitored during storage. ANOVA results showed that the five cultivars were characterized by different initial color and yellow intensity with b^* decreasing significantly from 'Marabel' (30.6), to 'Agria' (28.0), 'Almera' (21.6), 'Vivaldi' (19.6), and 'Agata' (16.5). Initial composition varied widely among cultivars and accounted for the different post-cutting performances. 'Marabel' and 'Agata' potatoes showed least color changes among the five cultivars, and scored the maximum for appearance when stored at 5 °C, while 'Marabel' received the highest score also when stored at 20 °C. 'Marabel' showed a relatively low phenol content (32.5 mg GE/100 g fw), low PPO activity (10.02 U/g fw), one of the highest antioxidant activities (18.02 mg TE/100 g fw) and the highest soluble sugar content (2.3 g/100 g fw). 'Vivaldi' and 'Agria' cultivars showed an intermediate potential in terms of storability and appearance, while 'Almera' was the less suitable cultivar to be used as fresh-cut, despite its high content in ascorbic acid (34.8 mg/100 g fw) and high antioxidant activity (23.2 mg TE/100 g fw), also showing one of the highest phenol content (46.1 mg GE/100 g fw) and PPO activity (14.7 U/g fw). A principal component analysis on the chemical and physical attributes showed a high correlation between phenol content, PAL and PPO activity, a^* value, and hue angle variation at 5 and 20 °C. Appearance score, and fructose and glucose contents were positively correlated with each other and inversely correlated with hue angle variation. Score, and fructose and glucose contents allowed discrimination between 'Marabel' and the other varieties. 'Marabel' and 'Agata' potatoes were represented by the negative portion of Principal Component 2, while 'Almera', 'Agata', and 'Agria' were located on the positive axis, highly correlated with hue angle variation which was statistically higher for these varieties.