Prediction of the physicochemical and nutraceutical characteristics of 'Hass' Avocado Seeds by Correlating the Physicochemical Avocado Fruit Properties According to Their Ripening State

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Abstract

Vegetal wastes are currently a source of pollution due to the excess of organic compounds in the environment. Seeds are the main by-product of the avocado industry and represent 16–22% of the total weight and it is considered a waste without applications. Despite the seed stands out for its high content of phenolic compounds, lack of knowledge regarding of the best processing state using non-invasive and short-time methods are required to take advantage of these nutraceutical compounds. This research aimed to find correlations from physicochemical analysis, color, hardness, and firmness of the whole avocado seeds with its nutraceutical properties as long as the ripeness increased, providing information for further industrial use of this waste. The results indicated that 'Hass' avocado fruit ripening positively correlates with the improvement of the physicochemical parameters involved in the fruit processing and the increase of nutraceutical compounds in the seed. The ripeness process decreased moisture (%) and hardness (N) parameters in the seeds (27.69 and 16.4%, respectively), facilitating its processing. Moreover, the ripening increased the antioxidant capacity by DPPH* around 7%, due to the concentration of phenolic compounds in the seed. Seed's phenolic compounds were positively correlated with the Hue angle at increasing ripeness, becoming a potential physicochemical indicator for the industry. The prediction of changes in nutraceutical compounds and physicochemical properties, as ripening occurred, may reduce analysis times, processes, and guidance to use avocado seeds as a by-product. These results facilitate the seed processing and open up opportunities for its use in the industry.