Title	Antioxidant capacity of fresh-cut carrots (*Daucus carota* L.) increases as wounding intensity increases
Author	B.B. Surjadinata and L. Cisneros-Zevallos
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Abstract

In previous work, we have shown that wounding stress increases the phenolic content and antioxidant capacity (AOX) of fresh fruits and vegetables. However, it is unclear how different wounding intensities (A/W) after this increase in AOX during storage. The objective of this study was to determine the effect of different A/W on total phenolics, AOX, and phenylalanine ammonia-lyase (PAL) activity in carrot tissue. Additionally, we characterized the effect of different carrot varieties and storage time. Carrots were washed with 100-ppm chlorine water, cut, stored in 4-L closed glass jars at 15 °C, and ventilated every 6-8 h to avoid CO_2 accumulation. In a first experiment, Apache carrots were cut into slices, pies, and shreds (A/W of 4.2 to 23.5 cm^2/g) and stored for 4 d before measurements. In a second experiment, Navajo, Legend, and Choctaw carrots were shredded (A/W = 23.5 cm^2/g) and stored for 8 d with measurements done periodically. Phenolics, AOX, and PAL activity were quantified using a spectrophotometer. Results indicated that phenolics, AOX, and PAL activity increased with increasing A/W. The increase was only significant in carrot pies and shred (A/W of 6.0 and 23.5 cm^2/g), however, not in slices (A/W=4.2 cm^2/g). In the second experiment, phenolics AOX, and PAL activity increased during storage for all shredded carrot varieties with PAL reaching a maximum activity on d 2. There was no significant difference in increased phenolics between carrot varieties, and only slight differences in increased AOX and PAL activity. These phenolic compounds showed a high correlation with AOX for all carrot varieties ($R^2 > 0.9$). If wounding stress can be used as a tool to enhance the nutraceutical content without jeopardizing other quality factors, then the fresh-cut industry can claim that fresh-cut produce will not only provide convenience but also a healthier food to the consumers.