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Effects of season and storage period on accumulation of individual carotenoids in pumpkin flesh (*Cucurbita moschata*) (Article)

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Abstract

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Carotenoids are antioxidants with pharmaceutical potential. The major carotenoids important to humans are α -carotene, β -carotene, lycopene, lutein, zeaxanthin, and β -cryptoxanthin. Some of the biological functions and actions of these individual carotenoids are quite similar to each other, whereas others are specific. Besides genotype and location, other environmental effects such as temperature, light, mineral uptake, and pH have been found affect carotenoid development in plant tissues and organs. Therefore, this research investigated the effects of the season and storage periods during postharvest handling on the accumulation of carotenoid in pumpkin. This study shows that long-term storage of pumpkins resulted in the accumulation of lutein and β -carotene with a slight decrease in zeaxanthin. The amounts of β -carotene ranged from 174.583 \pm 2.105 mg/100g to 692.871 \pm 22.019 mg/100g, lutein from 19.841 \pm 9.693 mg/100g to 59.481 \pm 1.645 mg/100g, and zeaxanthin from not detected to 2.709 \pm 0.118 mg/100g. The pumpkins were collected three times in a year; they differed in that zeaxanthin was present only in the first season, while the amounts of β -carotene and lutein were the highest in the second and third seasons, respectively. By identifying the key factors among the postharvest handling conditions that control specific carotenoid accumulations, a greater understanding of how to enhance the nutritional values of pumpkin and other crops will be gained. Postharvest storage conditions can markedly enhance and influence the levels of zeaxanthin, lutein, and β -carotene in pumpkin. This study describes how the magnitudes of these effects depend on the storage period and season. © 2014 by Japan Oil Chemists' Society.

Author keywords

[Carotenoid](#) [Postharvest](#) [Pumpkin](#) [Season](#) [Storage](#)

Indexed keywords

 Engineering controlled terms: [Chemical engineering](#) [Energy storage](#)
[Biological functions](#)
[Carotenoid](#)
[Carotenoid accumulation](#)
[Cucurbita moschata](#)
[Post-harvest storage](#)
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[Season](#)

 Engineering main heading: [Pigments](#)

 EMTREE drug terms: [beta carotene](#) [carotenoid](#) [mineral](#) [xanthophyll](#) [zeaxanthin](#)

 EMTREE medical terms: [chemistry](#) [food storage](#) [light](#) [metabolism](#) [nutritional value](#) [pH](#) [season](#) [squash](#) [temperature](#) [time](#)



 MeSH: [beta Carotene](#) [Carotenoids](#) [Cucurbita](#) [Food Storage](#) [Hydrogen-Ion Concentration](#) [Light](#) [Lutein](#) [Minerals](#)
[Nutritive Value](#) [Seasons](#) [Temperature](#) [Time Factors](#) [Zeaxanthins](#)

Chemicals and CAS Registry Numbers:

beta carotene, 7235-40-7; xanthophyll, 127-40-2, 52842-48-5; zeaxanthin, 144-68-3;

beta Carotene; Carotenoids; Lutein; Minerals; Zeaxanthins

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