Analysis of Antioxidants and Physical Properties in Carrot after Refrigeration and Freezing

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ABSTRACT

In this research, real processes were simulated for refrigeration and freezing, and the relationship between antioxidants and physical property of carrot was studied. Also the regression analysis was employed to figure out the relationship of antioxidant and electrical conductivity. The result will be examined by electronic microscope. Carrot was stored at 0℃ for 3, 7, and 14 days; and the other method was stored at -20℃ for 7, 14, 30 days. The results showed that the longer the carrot been stored at 0℃ and -20℃ the less vitamin C and carotenoid it will content. After the carrot has been refrigerated, the electrical conductivity of the carrot has slightly increased compare with the fresh one; and the electrical conductivity of the carrot been stored under freezer has increased sharply. The results also showed that the longer time the carrot been stored at the tested temperatures the higher the electrical conductivity would get. The observation result of the electronic microscope diagram shows that the refrigerated sample does not have any obvious destruction to its structure. However, the sample of the frozen storage has the internal cell structure breakdown. Color and luster result, the L value of the carrot after refrigerating did not change much. But, the color of the frozen carrot gets darker as the storage time increase. On the A value side, the color and luster of the carrots after been refrigerated and froze tends to fade away, and the color of the tested carrots turn from red into light red. On the B value side, the color and luster of the tested carrots turn from yellow into light yellow. The vitamin C content by using electrical conductivity was explored as the regression analysis got high value which the carrot has been refrigerated and frozen; and the carotenoid content by using electrical conductivity was explored as the regression analysis got high value after the carrot has been refrigerated. The result meants both electrical conductivity with vitamin C and carotenoid contents have direct relationship.

Keywords : vitamin C ; carotenoid ; food structure ; electrical conductivity

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