The Releasing of Lycopene from Vegetables by Various Thermal Treatments

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ABSTRACT

Lycopene, with molecular formula expressed as C40H56, is one of major red pigments in fruits and vegetables. Lycopene is the most antioxidative carotenoid and can be extensively found in red/orange fruits and vegetables. Although lycopene can be ingested via our daily foods, most lycopene in foods can't be digested easily without destruction by heat. In the literature, the efficacy of lycopene destruction by various heating processes has not been well explored, yet still is an very important issue. In this study, we dissected fresh carrot and tomato into cylinder samples and then treated these samples with various heating processes, like water bath, steaming, ohmic heating, and microwave heating. We measured the quantity of released lycopene from these samples heated at temperatures of 80 °C and 100 °C. The experimental results suggest that the highest release of lycopene from carrot can be achieved to 2.1mg/100g at 80 °C by microwave heating, and2.78mg/100g at 100°C with resistance heating. On the other hand, the highest release of lycopene from tomato, whether at 80 °C or 100 °C, can be both attained (9.27mg/100g and 9.20mg/100g, respectively) with ohmic heating. It may be concluded that the most effective heating process either for carrot or tomato is ohmic heating. It could be because the ohmic heating is able to not only provide heating effect but also damage cells and collapse tissue structures with electrical currents to benefit the release of lycopene.

Keywords : Lycopene, Heating process, Carotenoid

Table of Contents

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