

Effect of vacuum microwave drying on main carotenoids in pumpkin slices

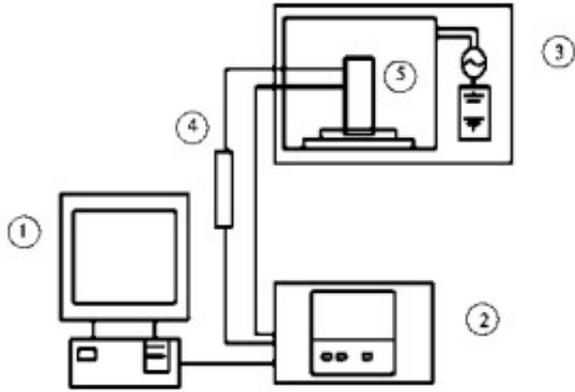
Abstract: The main carotenoids in pumpkin slices were determined qualitatively and quantitatively by C30 column and high performance liquid chromatography-diode array detection-atmospheric pressure chemical ionization tandem mass spectrometry. The results showed that the total carotenoid content of pumpkin slices dried by vacuum microwave was significantly higher than that dried by hot air (P

With the increase of microwave intensity, the content of total carotenoids in pumpkin slices decreased significantly (P Meanwhile, the contents of main carotenoids alpha-, beta-carotene and lutein in pumpkin slices decreased with the increase of microwave intensity, and increased with the increase of vacuum and slice thickness, while the cis-isomers of beta-carotene decreased with the increase of vacuum, but the content of cis-isomers did not change significantly with the increase of slice thickness. It can be seen that increasing the vacuum and the thickness of the slices is beneficial to increase the carotenoid retention rate, while high microwave intensity makes the carotenoid content decrease.

Key words: Pumpkin slices; [microwave drying equipment](#); carotenoids Pumpkin (*Cucurbita moschata*) is widely planted in China. It contains not only amino acids, vitamins, carbohydrates, pectin and trace elements, but also rich in carotenoids, especially alpha-carotene and beta-carotene. It has anti-oxidation, anti-cancer, prevention and treatment of cardiovascular diseases and immune system. Obstacles and other effects. Pumpkin is mainly used for fresh food, and its processing capacity is small. It often decomposes because it can not be sold or processed in time.

Drying is the most common preservation method for fruits and vegetables. Deep processing of harvested fruits and vegetables by drying can prolong the preservation time and increase the added value of the products.

However, the loss of carotenoids during [microwave drying of pumpkin](#) is a common phenomenon, resulting in deterioration of color and nutritional value, greatly affecting the quality of dried products. The effects of hot air drying and heat pump drying on the quality of pumpkin were studied. The results showed that the dry color of pumpkin became dark after drying, and the loss rate of carotenoids was over 50%. The total carotenoids content of pumpkin decreased greatly after microwave drying, vacuum drying and hot air drying.



Vacuum microwave drying is the combination of microwave and vacuum drying, which has obvious advantages in improving the quality of fruits and vegetables. On the one hand, microwave provides a uniform heat source for vacuum drying, on the other hand, vacuum environment makes the material can be completed at a lower temperature drying, can better retain the original color, fragrance and biological active functional components of the product, compared with other drying methods, has the advantages of rapid, low temperature, high efficiency and safety. The results showed that the content of beta carotene in sweet potato slices after vacuum microwave drying was much higher than that in hot air drying. The results showed that the retention rates of carotenoids and chlorophyll were 95.7% and 97% after vacuum microwave drying of carrot slices and leek.

The effects of vacuum microwave drying and hot air drying on the quality of carrots were compared. The results showed that the color, VC and alpha-carotene content of carrots dried by vacuum microwave drying were better than those dried by hot air drying. However, there are few studies on the changes of carotenoid composition and content in pumpkin under different vacuum microwave drying conditions. Based on this, the effects of three drying parameters (microwave intensity, vacuum degree and material slice thickness) on carotenoid composition and content in pumpkin slices under vacuum microwave drying conditions were studied. In order to provide a theoretical basis for the preservation of carotenoids in pumpkin vacuum microwave drying process.