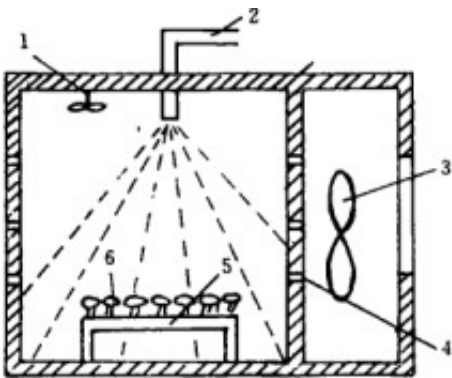


# Effect of Different Drying Methods on the Quality of Carrot Powder

Abstract: The carrots were dried and dried by hot air drying, medium and short wave infrared drying, [microwave drying equipment](#) and vacuum drying. The quality of the four carrot powders was compared and analyzed.

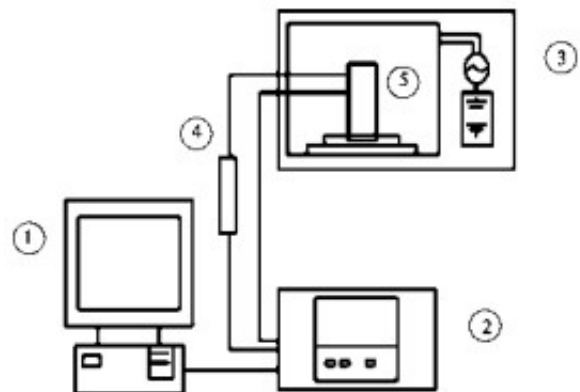


The results showed that the  $a^*$  value and rehydration capacity of carrot powder were characterized by medium-short wave infrared drying > vacuum drying > vacuum microwave drying > hot air drying; there was no significant difference in oil absorption capacity of carrot powder prepared by four drying methods; medium and short wave Infrared dry carrot powder has the highest content of total sugar and  $\beta$ -carotene, and vacuum dried carrot powder has the highest VC content; comprehensively, medium and short wave infrared dried carrot powder has good quality and is suitable for industrial production of carrot powder processing.

Key words: hot air drying; medium and short wave infrared drying; [carrot microwave drying](#); vacuum drying; carrot powder; quality

Carrot (*Daucus carota* L.) is a herbaceous plant of the genus Apocynum, a dicotyledonous plant. It originated in Central Asia and the Mediterranean region and has a cultivation history of more than 2000 years. At the end of the Yuan Dynasty, it was introduced into China, so it is called carrot, also known as red root, golden bamboo shoots, and clove radish. It is the root of the carrot of the Umbelliferae family. Its fleshy roots are edible and are one of the main vegetables in spring and winter. They enjoy the reputation of “small ginseng” and “golden bamboo shoots”. It is rich in many active substances such as carotene, vitamins, minerals

(calcium, potassium, sodium) and dietary fiber.



China is a country with a large area of carrot cultivation. After carrot harvesting, it is generally stored at -18 °C for 3 months. In recent years, dry milling has become a trend in the processing and storage of fruits and vegetables, and it has a wide range of applications. First of all, milling can not only increase the added value of the product but also reduce the transportation costs. Furthermore, carrot powdering not only has strict requirements on the size and shape of raw materials, but also does not cause environmental pollution caused by residue, and it can make full use of dietary fiber and nutrients in raw materials to realize the full utilization of raw materials. Comprehensive utilization technology.

In recent years, there have been many ways to apply carrots. Hot air drying is the most widely used drying method. Medium and short wave infrared drying is a relatively new drying method. Its wavelength range is between 1.0 and 4.0  $\mu\text{m}$ . Infrared ray energy can reach the surface of the object without heating the surrounding air. The drying of the product is realized; vacuum drying is also a drying method which has been applied more frequently in recent years. In this drying mode, the air is insulated under a negative pressure state, so that some chemically changed materials which are easily oxidized during the drying process are better maintained. The characteristic is therefore a representative drying method for isolating air drying; and vacuum microwave drying is a combined drying method in which vacuum drying and microwave drying are combined.

In this experiment, the four drying methods were used to dry the carrots. After pulverization, the physical properties and nutrients of the carrot powder prepared by different drying methods were compared and analyzed, in order to provide reference for the processing of carrot powder.