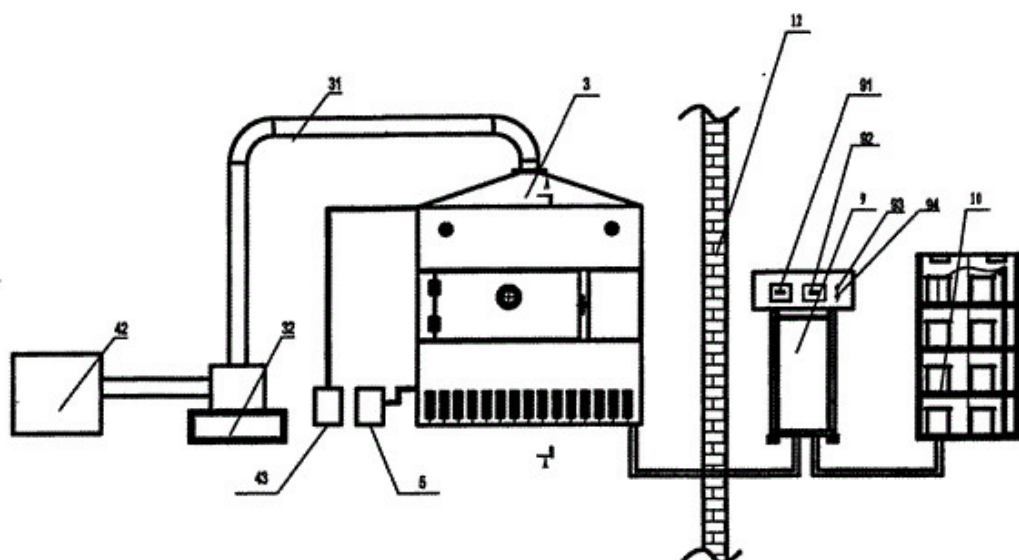


Effect of drying method on quality characteristics of pear jujube powder



Abstract The effects of four drying methods, such as hot air drying, [microwave drying equipment](#), vacuum drying and vacuum freeze drying, on the physical and chemical properties and antioxidant activities of pear jujube powder were studied. The results showed that the effect on vitamin C content was vacuum freeze-drying > microwave drying > vacuum drying > hot air drying, and there was no significant difference in the total sugar content, which reduced the titratable acid content.

Different drying methods have significant effects on total phenol and total flavonoids in pear jujube powder. The antioxidant activity of vacuum freeze-dried pear jujube powder was significantly better than hot air drying and vacuum drying. The total phenolic acids in hot air drying, vacuum drying, microwave drying and vacuum freeze-dried pear jujube powder were 39.91, 87.46, 92.56, 110.82 mg/kg, respectively. On the whole, vacuum freeze-drying technology not only retains the physical and chemical properties of pear jujube powder, but also helps to maintain the antioxidant activity of pear jujube powder.

Key words: [pear jujube microwave drying](#); drying method; vacuum freeze-drying; quality; antioxidant activity

Pear jujube is a jujube tree fruit of Jujube, which is an important and excellent fresh food in the



production of jujube in China.

Pear jujube is rich in vitamins, minerals, phenolic substances and essential amino acids. It is a traditional nourishing product and a combination of medicine and food. It has the functions of strengthening the spleen and nourishing the stomach, replenishing the vital energy, nourishing the lungs and strengthening the kidneys. Drug toxicity, anti-aging health care and other effects. In recent years, with the promotion and application of dwarf dense planting cultivation method in the Loess Plateau of northern Shaanxi, the mountain pear date has achieved good ecological and economic benefits.

In recent years, due to the changing climate of the world, the frequency of rainy weather in the mature stage of pear jujube has increased, causing the rupture of pear dates. If the processed pear jujube is processed into pear jujube powder, it can not only improve the comprehensive utilization value of pear jujube, but also provide a new way for the development and utilization of pear jujube. Pear jujube is consumed in China by dry products. Different drying methods have great influence on the nutritional quality of jujube powder, and the effects of different drying methods on its quality characteristics are less studied.

In this experiment, the dried jujube powder was dried by hot air drying, microwave drying, vacuum drying and vacuum freeze drying. The effect of drying method on the quality characteristics of pear jujube powder was studied, and the drying method and function of pear jujube powder were studied. Product development and utilization provide a new basis.

Different drying methods had no significant effect on the total sugar content of pear jujube powder ($P>0.05$). The total sugar content in pear jujube powder was significantly reduced after hot water drying with water and de-sugar treatment, indicating that the addition of water treatment can significantly reduce the jujube powder. The water-soluble sugar content further reduces the total sugar content in the dried jujube powder.

The titratable acid content of the five types of pear jujube powder varied greatly. Adding water and deacidification treatment makes the titratable acid content of R, L, W and Z four types of pear jujube powders significantly lower than RY, and the freezeable dry jujube powder has the lowest titratable acid content ($(0.353\pm0.004)\%$). Yu Jingjing et al. studied the effects of different drying methods on the quality characteristics of jujube. The results showed that the titratable acid content in jujube powder was vacuum drying > hot air drying > microwave drying > freeze drying.