An overview of techniques for drying fruits and vegetable

Fruit is a fresh and perishable agricultural product rich in water content, which is easily spoiled by various adverse physical, chemical and biochemical reactions caused by microorganisms and enzymes. Fruit byMicrowave drying machinery and equipment,It can reduce water content, inhibit microbial reproduction and inhibit enzyme activity in fruit. Dried fruit products can be stored at room temperature for a long time and are easy to transport and carry [1]. Therefore, fruit drying has become a very active research direction in food processing technology. The system optimization of drying technology requires that the original nutrition components of fruits be guaranteed to meet the quality requirements of consumers for product color, aroma and taste.

Microwave dry fruits and vegetables

Refers to the electromagnetic wave with a wave length between 1mm and 1m and a frequency rate between 300MHz and 300GHz. Electromagnetic wave has electric field energy and magnetic field energy, and the polarity of electromagnetic field changes constantly. Under the field induction effect of various molecules in the material, they will become dipoles with positive and negative poles, and the positive and negative poles of the dipole will always remain opposite to the polar direction where it is present. When the polarity of the electromagnetic field changes, the dipole reverses accordingly. When the polarity of the electromagnetic field changes alternately in the high frequency rate, the dipole in the electromagnetic field will also undergo extremely high speed reversal, oscillation and migration. For example, at the microwave frequency of 2450MHz, the dipole oscillation can reach 680,000 times per second, and the dipole will collide and rub with each other, resulting in mechanical damage force and a lot of heat. Water molecules are the most easily polarizable molecules in materials, and move the most violently in the electromagnetic field generated by microwave. The generated heat causes water molecules to rapidly escape from the material surface, thus achieving the purpose of drying [2].

In the industrial field, China allows 915MHz and 2450MHz microwave frequencies for heating. Because microwave drying is caused by the internal dipole collision, friction and heat production and the water molecules out of the material, so microwave drying has the advantages of uniform heating, drying time is short, which makes the microwave drying fruit products more nutritious, high production efficiency. Microwave drying has been widely used in foreign countries.

Although microwave drying technology in China has a history of more than 30 years, it is limited by the stability of equipment operation, automatic control level, electromechanical integration and backward equipment supporting facilities