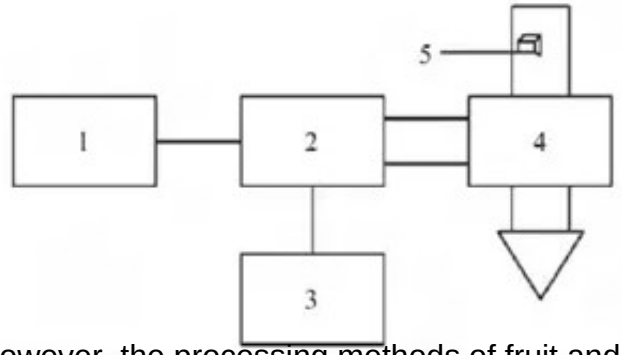
Research progress of microwave drying technology for fruits and vegetables

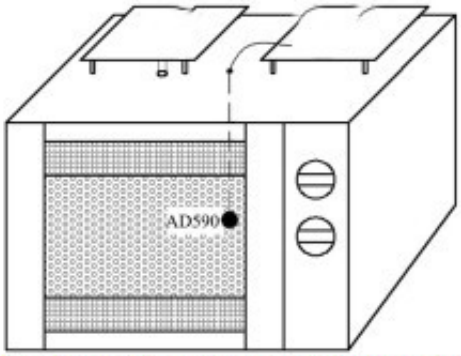
Abstract: This paper reviews the research on microwave drying technology of fruits and vegetables at home and abroad. It compares microwave with other drying methods, introduces the application of microwave combined with other drying methods, and expounds the characteristics and laws of microwave drying fruits and vegetables.

Key words: microwave drying equipment; fruits and vegetables

Fruits and vegetables are an indispensable part of people's daily lives, and they provide abundant nutrients and minerals for human beings. Due to the high water content of fruits and vegetables, it is generally preserved by drying. With the improvement of living standards and the accelerated pace of life, people began to have a special liking for nutrient-rich portable fruit and vegetable chips, and the demand for it is increasing.



However, the processing methods of fruit and vegetable chips in the market mostly use the traditional frying and drying method, which not only causes the loss of nutrients of fruits and vegetables, but also produces some toxic and harmful substances such as acrylamide during processing. Therefore, it is necessary to find a method for drying fruits and vegetables that can better maintain the nutrients of fruits and vegetables and avoid toxic and harmful substances to the products. Microwave is an electromagnetic wave that produces high-frequency



Schematic diagram of microwave drying temperature control system

electromagnetic fields.

When the material is dried by microwave, the polar molecules in the dielectric material change

polarity orientation with the frequency of the electromagnetic field in the electromagnetic field, causing the molecules to vibrate back and forth to generate frictional heat; since the dielectric constant of the liquid water in the material is large, the water is preferentially heated and evaporated. At this time, a large amount of microwave energy is absorbed and converted into heat energy, so that the temperature of the material is continuously increased, and the microwave inside the material is heated integrally, that is, heating both inside and outside, thereby avoiding the phenomenon of "outside focus, endogenous" phenomenon. Further, a better drying effect is obtained.

Microwave drying of fruits and vegetables has the characteristics of sensitive reaction, easy control, high thermal efficiency, no residual heat, no pollution, etc. Therefore, the use of microwave drying technology in the field of fruit and vegetable processing has the advantages of fast drying, high production efficiency, high drying quality, high energy utilization rate and both. The advantages of sterilization, product rehydration and so on. Microwave drying is an ideal method for drying fruits and vegetables. The following is a further description of the research and application of microwave technology in dry fruit and vegetable chips in recent years.