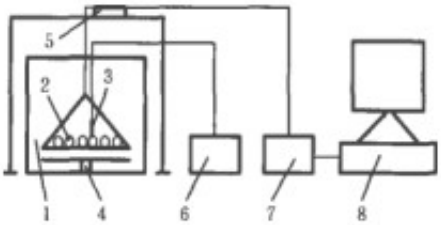
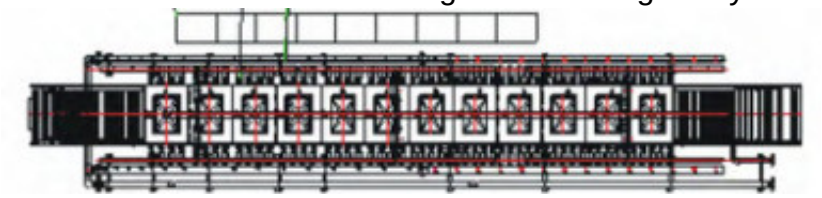
Research progress on new fruit and vegetable drying technology



Abstract: This paper discusses the development trend of deep processing technology of fruits and vegetables and drying technology of new fruits and vegetables. The characteristics of vacuum freeze drying, microwave drying equipment and vacuum frying drying technology are compared. Finally, the characteristics of variable temperature and temperature differential expansion drying technology and the development trend at home and abroad are introduced. It is expected to provide some reference for the research and development of fruit and vegetable drying technology.

Key words: microwave drying of fruits and vegetables; drying technology; temperature difference

At present, countries such as the United States, Western Europe and Japan use fresh fruit and vegetable juices to formulate or process fruit juice beverages, which have a good effect on maintaining normal metabolism, preventing disease and inhibiting the formation and development of cancer cells. The results of modern epidemiological studies have confirmed that the intake of fresh fruits and vegetables is negatively correlated with the incidence of cancer.



Kiwi, garlic, seabuckthorn and some common vegetable juices can effectively block the synthesis of strong carcinogens, N-nitroso compounds (NC), in vitro and in vivo. The antioxidant activity of some fruit and vegetable juices showed that fresh fruit and vegetable juice can also block the formation of thiobarbituric acid reactant (TBAS) and scavenge superoxide radicals.

Fruits and vegetables contain many natural phytochemicals that have important physiological activities. For example, blueberries are called “No. 1 Antioxidant” in fruits and vegetables. It has the functions of preventing dysfunction, improving short-term memory, and improving the balance and coordination of the elderly. Separating, extracting and concentrating these functional ingredients from fruits and vegetables, making capsules or adding these functional ingredients to various foods has become a new trend in the current processing of fruits and

vegetables.

Compared with traditional drying, microwave drying can inhibit browning and better preserve product color; microwave dried product has porosity, and its bulk density is smaller than that obtained by conventional drying; microwave drying reduces the maximum stress that can be withstand the product. And maximum strain, increased elasticity, reduced viscosity, combined with vacuum drying, the elastic increase is more significant.
The microwave drying effect is affected by the microwave dose, in combination with other drying methods, temperature, and the like.
There are 3 ways to use microwave with other drying:
1) Use microwave energy before dehydration.
2) Use microwave energy when the drying rate begins to drop.
3) Microwave energy is used in the drying rate reduction stage or the low moisture content stage for final drying.

In the process of puffing of fruits and vegetables, most fruits and vegetables need to be peeled and denucleated. In industrial production, a large amount of peels and cores are produced. If they are not used well, they will not only increase production costs but also pollute the environment. If it can be used well, it can increase the added value and improve the economic and social benefits of the enterprise.
For the drying process of fruits and vegetables, water mass transfer and its heat transfer mechanism need further research and discussion.