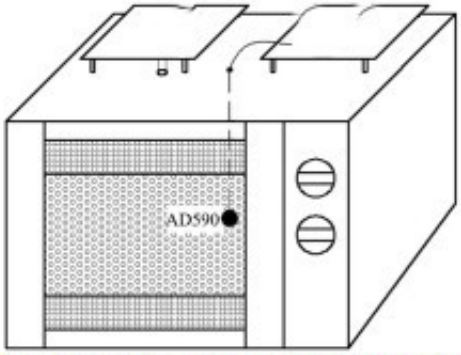
Effect of hot air, microwave and its joint drying on the quality of garlic slices



Schematic diagram of microwave drying temperature control system

Abstract: In order to study the effects of hot air, microwave and its joint drying on the quality of garlic slices, the garlic tablets were used as raw materials, and the drying rate, thiosulfinate content, sensory score, color L value, rehydration ratio and comprehensive score were Index, compare the effects of different hot air temperature and microwave drying equipment on the drying characteristics and quality of garlic slices, and design the L (33) orthogonal experiment on hot air microwave combined with hot air temperature, dry point water content and microwave power as experimental factors. The process conditions of the dried garlic pieces are optimized.

The results showed that: 60 ? hot air drying and a higher total score 550 W microwave drying apparatus resulting dry product garlic, 83.64 and 80.74 minutes, respectively. The effect of hot air temperature and microwave power on the comprehensive score of combined dried garlic tablets was extremely significant (p

Under these conditions, the drying rate of the dehydrated garlic slices was the fastest, the highest thiosulfinate content was 1.7739 mmol /100 g, and the comprehensive score was 92.21, and the sensory quality was better. Therefore, hot air microwave combined drying technology is a better method for drying garlic slices.

Key words: garlic microwave drying, hot air drying, combined drying, drying quality

Garlic (Allium sativum) is a perennial herb of the family Allium sativum. It is rich in nutrients, has antibacterial and anti-inflammatory properties, enhances immunity, prevents arteriosclerosis and cancer and other health functions, and can alleviate and treat diseases such as hyperlipemia, high cholesterol and diabetes. The main active ingredient of garlic is eight thiosulfinate compounds.

Allicin (diallyl thiosulfinate) is the most important thiosulfinate, accounting for about 70% of the total thiosulfinate of broken garlic. However, garlic has a short dormancy period, is easy to germinate and rot, and is not resistant to storage. Dehydrated garlic maintains the original color,

aroma, taste and nutrients, and prolongs the storage period. 80% of the garlic harvested in developed countries is used to produce dehydrated garlic.

Combined drying has the characteristics of improving the quality of dried fruits and vegetables, shortening drying time, energy saving, safety and high efficiency, and overcomes the shortcomings of single drying. Wang Jing et al. used hot air and vacuum microwave to dry the garlic slices. In the early stage, vacuum microwave was used for 20 min, and hot air drying was used for 60 min. The product quality was higher and the drying rate was improved.

However, there are few reports on the combination of hot air and microwave drying garlic. For this reason, the experiment explored the effect of hot air, microwave and hot air microwave drying on the drying quality of garlic slices, aiming to determine the drying parameters of garlic slices and seek joint drying suitable for garlic. The method improves the quality of garlic slices and provides theoretical data for the drying of fruits and vegetables.