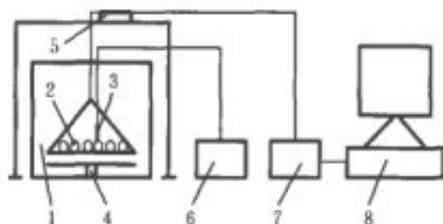


Effects of drying methods on hydration characteristics and antioxidant capacity of purple potato powder



Abstract: the effects of [microwave drying equipment](#), freeze drying, hot air drying and spray drying on the hydration characteristics and antioxidant capacity of the whole powder of purple sweet potato "Wan Zi 56" were studied. The results showed that the water holding capacity and rehydration ability of the purple sweet potato powder prepared by freeze-drying were higher than that of hot air drying, microwave drying and spray drying, but the water solubility was the worst.

Drying resulted in a loss of 27.64% to 52.66% of anthocyanins in purple sweet potato powder. The maximum retention rate of anthocyanins in freeze dried and spray dried purple sweet potato powder was significantly higher than that in other two drying methods (P

Key words: [Purple potato microwave drying](#), drying methods, hydration characteristics, antioxidant capacity



Purple potato is a new type of cultivated sweet potato. Its flesh is dark purple. It is also called purple sweet potato, purple sweet potato, purple sweet potato or purple sweet potato. Purple potato is different from ordinary sweet potato varieties, and its nutrient content is significantly higher than that of ordinary sweet potato. The market development of purple potato mainly concentrates on pigment extraction, fresh food, whole powder and leisure food processing.

Purple potatoes are processed into powder after peeling, drying and crushing. They have beautiful color and rich nutrition. They are mainly used as raw materials and accessories of bread, steamed bread, puffed food, soup, granulation and other products. They are also widely used in the processing and manufacturing of convenience food, frozen food and conditioning food.

However, in the production practice of purple potato powder at home and abroad, there is no comparatively consistent and advanced drying technology, and the drying technology is very immature. The hydration characteristics and antioxidant capacity of purple potato powder treated by different drying methods were investigated and compared in order to provide a

theoretical basis for the processing of purple potato powder in food industry.

The effects of drying methods on the basic components, hydration characteristics, antioxidant capacity and antioxidant capacity of purple potato powder were studied. After drying, there was no significant difference between crude protein and crude fat in purple potato powder, but there were significant differences in starch, crude fiber, total phenol content and antioxidant content.

The unit water energy consumption of the four drying methods is from freezing to drying, hot air drying, spray drying, and microwave drying. From the perspective of water holding capacity and rehydration, the following are: freeze drying, hot air drying, microwave drying, spray drying, and the water solubility index increases in turn.

The DPPH free radical scavenging and reducing power of the purple sweet potato solid powder obtained by spray drying is the highest, which indicates that spray drying can keep the nutrition and structural integrity of purple sweet potato as far as possible, thereby showing better quality, making it better processed in food raw materials or excipients processing, while the DPPH free radical scavenging and reducing power of the products obtained by hot air drying are the lowest.

From these two antioxidant models, flavonoids and total phenols are the main antioxidants. The order of inhibition of lipid peroxidation is freeze drying, spray drying, microwave drying and hot air drying. The main reason is that vacuum freeze-drying has little damage to anthocyanins which inhibit lipid peroxidation. From the perspective of the quality of purple sweet potato powder, freezing and spray drying are better. From the point of view of energy saving, microwave and spray drying are better. Comprehensive consideration, spray drying effect is better.