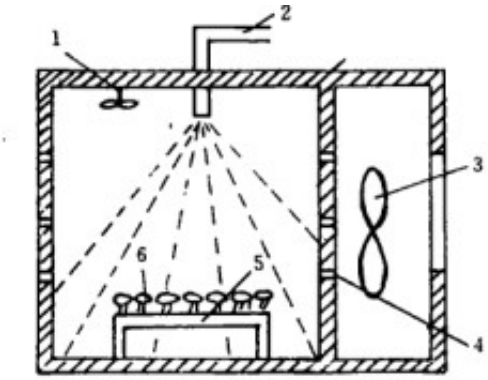
# Effects of different drying methods on the functional properties of peanut protein




Effect of 2.1 microwave drying equipment on water holding capacity and oil absorption of peanut protein

The oil absorption of peanut protein by different drying methods was MD-VD > MD > VD > RD, and the water holding capacity of peanut protein by different drying methods was MD-VD > VD > MD > RD. Peanut treated with MD- VD
The oil absorption and water holding capacity of the protein were the highest.
From the microscopic point of view, the oil and water holding capacity of protein is related to the properties of lipophilic hydrophilic groups on the surface of protein molecules and the physical interception of protein molecules. The larger the volume density, the smaller the oil holding capacity and water holding capacity. The volume density of peanut protein dried by hot air is high, so the oil-holding capacity and water-holding capacity are low; the volume density of vacuum drying sample is small, but the oil-holding capacity and water-holding capacity are not high, which may be caused by the long time of vacuum drying, the growth of microorganisms in it and the denaturation of protein; the microwave drying time is short, but the moisture content decreases to a certain extent. MD-VD products, which combine the advantages of microwave drying and vacuum drying, have high oil and water holding capacity.
Determination of oil absorption and water holding capacity of peanut protein
The 0.5 g sample was placed in a centrifugal tube, added salad oil 5 g, and stirred evenly. After standing for 30 minutes, the volume of free oil was measured by 3000 r/min and centrifuged for 25 minutes. The oil absorption capacity of the sample was calculated.
Oil absorption capacity = 5 g- free oil mass * 100%
0.5 g
0.5 g samples were dispersed in 10 mL of water, 80 bath at 60.
After cooling to room temperature for 10 minutes, the supernatant volume was measured and the water holding capacity of peanut protein powder was calculated.
Water holding capacity = 10 g- supernatant quality * 100%
0.5 g
Determination of emulsification and emulsion stability
The 3 G protein product was dissolved in 50 mL distilled water, adjusted pH 7.0, added 50 mL cottonseed oil, homogenized for 2 min at the speed of 10 000 r/min to 12 000 r/min in a high speed tissue rammer, transferred into a 50 mL centrifugal tube, centrifuged for 5 min at the speed of 1500 r/min, and the emulsification was calculated according to the height of the

emulsified layer.
Emulsification = emulsification layer height * 100%
Total height
The emulsion was then homogenized in a 10 mL calibration tube and placed in a 50 C water bath for 30 minutes. The volume of the lower water phase was recorded. The emulsification stability was calculated as follows:
Emulsification stability = 30 min after static water volume 100% *
Total volume
Determination of foaming and foaming stability
The 2 g sample was dissolved in a 100 mL buffer solution, the pH value was adjusted to 7.0, and then homogenized in a high-speed tissue mill (10 000 r/min ~ 12 000 r/min) for 2 min to make emulsion. After homogenization stopped for 1 min, the foam volume V1 (mL) was recorded and the foaming property (FI) was calculated. After homogenization stopped for 20 min, foam volume V2 (mL) was recorded and foam stability (FS) was calculated.
FI= V1 * 100%;
100 mL
FS= V2 x 100%
V1

Effect of 2.2 peanut microwave drying equipment on emulsifying property and stability of peanut protein

Emulsifying property refers to the area of oil-water interface where the protein of unit mass can stabilize when promoting oil-water mixing, while emulsifying stability refers to the ability of the protein to maintain the emulsifying property of oil-water mixing and resist strain to external conditions. These two properties are related to the distribution of hydrophilic and lipophilic groups on the molecular surface. Protein drying methods are different, protein denaturation is different, and the exposure degree of hydrophobic groups in the protein is different. Therefore, the emulsification and emulsifying stability are different.

3 conclusion

Different drying methods will have different effects on the structure of peanut protein, so that peanut protein has different functional properties. MD-VD drying of peanut protein retains the advantages of MD and VD. Not only the drying time is short, but also peanut protein has better functional properties, is a kind of dry peanut protein. Suitable method.