

# Study on the characteristics and quality of drying with hot air and microwaves of the germinated brown rice

The effect of the hot air drying equipment and the [microwave drying equipment](#) on the drying characteristics, main nutrients, enzymatic power. The hardness and color of the sprouted brown rice were established. The mathematical model provides a basis for the prediction of microwave drying quality and the control of drying conditions.

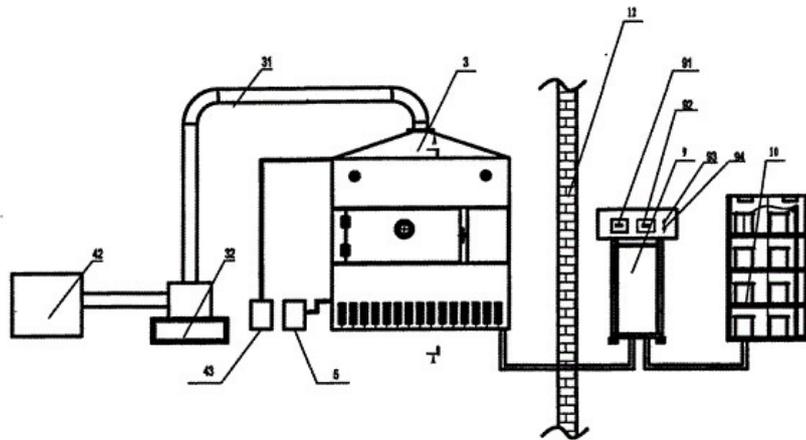
The dry model and the Page equation based on the Fick diffusion law can be well adjusted to the hot air curves and microwave drying of the sprouted brown rice. With the increase of the temperature of the hot air or the increase of the specific power of the microwave, the speed of constant drying and the effective diffusion The energy of activation of the drying of hot air of the germinated brown rice was of 55.76 kJ / mol. The drying conditions have a significant effect on the main nutrient content, the enzymatic hydrolysis and the hardness of the sprouted brown rice. The sprouted brown rice undergoes a browning reaction during the drying process, and the color is probably yellow. The reddening of the germinated brown rice is obtained by drying with microwaves. It is greater than that of hot air drying.

Keywords: germinated brown rice; drying with hot air; drying with microwaves; mathematical model;  $\gamma$ -aminobutyric acid

It was germinated to obtain germinated brown rice under suitable environmental conditions such as temperature and humidity. During the germination process, the endogenous enzyme is activated, the outer layer of the crude fiber is softened enzymatically, the protein is degraded into polypeptides and amino acids. And the starch becomes sugar. Phytase degrades phytic acid in inositol and phosphoric acid, and also produces  $\gamma$ -aminobutyl. Physiologically active ingredients such as acid, ferulic acid and hexa-inositol phosphate improve the nutritional composition and taste of brown rice. .

Among them, GABA is a widely existing inhibitory neurotransmitter, which has the effects of preventing Alzheimer's disease, hypertension, anxiety and the search for lipid metabolism.

Fresh sprouted brown rice has a high water content, rich nutrition and mold, and drying is the key technology to improve the shelf life of sprouted brown rice. Currently, the research on the drying of the sprouted brown rice focuses mainly on the effect of the drying process on the speed of drying, the composition of nutrients, the processing properties and the color of the



sprouted brown rice.

The study has shown that germinated brown rice can be stored safely in the water content after proper drying with hot air or microwaves, and has good nutritional, sensory and processing properties. Drying with hot air has the characteristics of simple operation of drying equipment and large scale. Microwave drying has the characteristics of high speed, high efficiency and high safety. Microwave drying has the characteristics of high speed, high efficiency and high safety.

At that time, the mathematical model of drying by thin layer of hot air germinated. Brown rice has been studied, but the mathematical model and drying quality of [microwave drying of sprouted brown rice](#) are not yet clear.

In this paper, the drying characteristics of the hot air of germinated brown rice and browning of brown rice were studied, and a dry mathematical model was established to investigate the effective water diffusion coefficient, the activation energy, the sugar reducer, the free amino acid and the GABA content of Sprouted whole rice and characteristics of starch digestion, hardness and color. The impact of the prediction of the quality of the germinated brown rice and the control of the drying conditions.