

Effect of pretreatment, drying temperature and intermittent drying technique on physical properties of oyster mushroom

H.T. JADHAV AND S.T. PATIL

Accepted : August, 2008

ABSTRACT

The oyster mushroom (*Pleurotus sajor caju*) was dehydrated using various pretreatments viz., control, CaCl₂ solution, sulphuring and CaCl₂ solution + sulphuring. The drying of Mushroom was carried out intermittently using tray dryer. Three cycles of intermittent drying viz., 1: 0.5 h, 1: 1 h and 1.5: 1 h for on and off the dryer were used for the dehydration. Two drying temperatures 50^o C and 60^o C were used during study. The effect of different combinations of pretreatments, drying temperatures and intermittent drying techniques on physical properties viz., bulk density, true density and porosity of dehydrated mushroom was studied. Initial values of bulk density, true density and porosity of fresh mushroom were found between 218 to 232 kg/m³, 1250 to 1335.30 kg/m³ and 81.99 to 82.56 %, respectively. The bulk density of dehydrated mushroom samples was maximum (140.71 kg/m³) for CaCl₂ + sulphuring, 50^oC, 1: 0.5 h treatment, while it was minimum (50.33 kg/m³) for control, 50^oC, 1.5: 1 h treatment. The true density was found maximum (2426.49 kg/m³) for sulphuring, 60^oC, 1.5:1 h treatment and it was minimum (1739.57 kg/m³) for control, 60^o C, 1:1 h treatment. The porosity was maximum (97.42 %) for control, 50^oC, 1.5:1 h treatment, while it was minimum (91.99 %) for CaCl₂ + sulphuring, 50^oC, 1: 0.5 h treatment.

See end of the article for authors' affiliations

Correspondence to:

H.T. JADHAV

Department of Agricultural Engineering
College of Agricultural Engineering and Technology, Dapoli, RATNAGIRI (M.S.) INDIA

Key words : Mushroom, intermittent drying, Bulk density, True density, porosity.

Mushrooms are large reproductive structure of edible fungi that has fascinated man around the world since ancient times and such edible fungi belong to either Ascomycotina or Basidiomycotina groups. Mushrooms are popular for their delicacy and flavour and can be regarded as the vegetable of the future. The protein content of fresh mushrooms is as high (20-35% dry weight basis) as that of most of the vegetables. Mushrooms contain vitamins not occurring in green plants such as B1, B2, B6, B12 and C. Therefore, mushrooms can be treated as a healthy and nutritive food supplying good amount of proteins, minerals and vitamins (Chelwal and Chaudhary, 1994).

Mushrooms are highly perishable because of their high moisture content and delicate nature and can not be stored for more than 24 h at ambient temperature. The development of appropriate storage and processing technology in order to extend their marketability and availability to consumers is a major goal of food processing. Of the different available techniques of preservation, dehydration is probably the oldest method of food preservation practiced by mankind. The removal of moisture prevents the growth and reproduction of microorganisms. The present study was undertaken with a view to study the effect of drying temperature, pretreatments and intermittent drying technique on physical properties of dehydrated mushroom.

METHODOLOGY

The present research work was carried out at department of Agricultural Process Engineering, Faculty of Agricultural Engineering, M.P.K.V., Rahuri.

Sample preparation:

Freshly harvested mushrooms of *Pleurotus sajor caju* variety were cleaned manually to remove trashes of wheat straw and other undesirable matter. Whole fresh mushrooms were used for dehydration.

Pretreatments:

Control: Fresh cleaned mushrooms without any pretreatment were considered as control.

CaCl₂ Solution: Fresh cleaned mushrooms were soaked in 0.5 % calcium chloride solution for 10 minutes (Sonar and Sonawane, 2000).

Sulphuring: The sulphuring was carried out by burning 2 g sulphur powder per kg of mushrooms for 2 hours in a fumigation chamber (Chavan *et al.*, 1993).

CaCl₂ solution + sulphuring: Fresh cleaned mushrooms were soaked in 0.5 % calcium chloride solution for 10 min. After 10 min mushrooms were taken out from calcium chloride solution and spread on blotting paper to get surface CaCl₂ solution drained off. Then sulphuring was carried out by burning 2 g sulphur powder per kg of soaked mushroom for 2 hours in a fumigation chamber.