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## Evaluation of Processing Parameters for Hot-Air Drying to Obtain High Quality Dried Mushrooms in the Mediterranean Region

DIMITRIOS ARGYROPOULOS, ALBERT HEINDL, JOACHIM MUELLER

*University of Hohenheim, Institute of Agricultural Engineering, Tropics and Subtropics Group, Germany*

### Abstract

Mushroom is an important commodity in the Mediterranean region and appreciated for its delicacy, nutritional and medicinal characteristics. In Greece, approximately 1150 species of fungi have been identified as mushrooms and at least 400 species have shown various degrees of edibility. In mountain and hilly areas, mushroom foraging followed by picking, cooking and eating is not only a recreational habit but also a source of a seasonal income for the local population. Owing to Mediterranean climate, the seasons are wet with mild temperatures in spring and autumn favouring suitable environmental conditions for fungal growth. Specifically, Epirus and West Macedonia regions located in northwestern Greece have a large potential of various wild-growing mushrooms for production and consumption. However, fresh mushrooms are highly perishable commodities with short shelf life and their commercialisation becomes difficult. Among the various techniques employed for the preservation of mushrooms, drying seems to be an effective approach to enhance storability and ensure distribution.

The aim of this study was to investigate the drying behaviour of mushrooms and to evaluate the effect of drying parameters on quality in terms of colour, texture and rehydration capacity. Prior to drying, button mushrooms were soaked in a solution of 0.25 % potassium metabisulfite and 0.1 % citric acid for 5 min at room temperature. Treated mushroom slices were dried in a through flow laboratory dryer at Hohenheim University in Stuttgart, Germany under industrial drying temperatures (30/60°C, 60°C, 80/60°C and 80°C) maintaining 10.0 g kg<sup>-1</sup> of absolute humidity and 0.9 m s<sup>-1</sup> of air velocity. Trials were carried out at 15 and 20 g kg<sup>-1</sup> absolute humidity maintaining a temperature of 60°C to examine the effect of relative humidity. The results indicated that the air temperature and slice thickness were significant factors affecting the drying characteristics of mushrooms. Quality was negatively affected by higher temperatures and duration of the drying process. Stage drying at 30/60 °C showed improved quality characteristics. Additionally, hot-air dried samples were compared with those dried by freeze drying and the combination of microwave-vacuum and hot-air drying. Freeze drying gave superior quality products while the combined technique produced a unique texture property.

**Keywords:** Mushroom, hot-air-drying, quality