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## Post Harvest Handling of Mushroom

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### Abstract

The present agricultural scenario of India has to emerge as an economic power in the world in terms of agricultural productivity by adapting new technologies leading to the economic power of the world. In India, any mushroom is used as a non-traditional cash crop and commonly cultivated species are white button mushroom, oyster, shiitake mushrooms and other mushrooms cultivated in small scale are paddy straw, milky and reishi mushrooms. Though around 20 genera of mushrooms are being cultivated for commerce throughout the world, only four types, viz., white button mushroom (*Agaricus bisporus*), oyster mushroom (*Pleurotus* spp.), milky mushroom (*Calocybe indica*) and paddy straw mushroom (*Volvariella volvacea*) are grown commercially in India with the white button mushroom contributing about 85% of the country's production against its global share of about 31 per cent. The production of mushroom is done throughout the year by the environmentally controlled units, but the seasonal growers come into play during the winters and the supply at the local market exceeds causing less profit due to fall in price and spoilage due to market surplus. Mushrooms are highly perishable and get spoiled due to browning, wilting, liquefaction, loss of texture, aroma, flavour, etc, making it unsaleable. Most of the mushrooms, being high in moisture and delicate in texture, it cannot be stored for more than 24 hours at the ambient conditions prevailing in the tropics. There fore it becomes imperative to adopt scientific post harvest management practice to extend its shelf life. This paper is thus aimed at to provide brief information of Post harvest Management practices to be adopted to improve its shelf life and quality.

**Keywords:** Mushroom, Handling, Shelf life, Quality, Spoilage

### 1. Introduction

Mushrooms are long been valued as high medicinal and nutritional food by many societies around the world. Mushrooms are consumed as a medicine in Asian countries and many researcher works have been done on medicinal aspects (Halpern and Miller, 2002) <sup>[1]</sup>. Mushrooms are used in Ayurveda and folk medicine in India (Jitendra and Vaidya, 2000) <sup>[2]</sup>. India is a largely agricultural country and producing a huge quantity of agro-wastes every year approximately 620 million tons (Singh and Sidhu, 2014) <sup>[4]</sup>. The present agricultural scenario of India has to emerge as an economic power in the world in terms of agricultural productivity by adapting new technologies leading to the economic power of the world. In India, any mushroom is used as a non-traditional cash crop and commonly cultivated species are white button mushroom, oyster, shiitake mushrooms and other mushrooms cultivated in small scale are paddy straw, milky and reishi mushrooms. Button mushroom accounts for approximately 95 % of total production and exports. Button mushroom is cultivated in temperate regions of Himachal Pradesh, Jammu and Kashmir, however the oyster, milky, paddy straw mushrooms are cultivated in the tropical and subtropical regions. Mushroom cultivation has become a business and export-oriented.

Mushrooms are a rich source of good quality protein, having most of the essential aminoacids, minerals and vitamins with low calories. Though around 20 genera of mushrooms are being cultivated for commerce throughout the world, only four types, viz., white button mushroom (*Agaricus bisporus*), oyster mushroom (*Pleurotus* spp.), milky mushroom (*Calocybe indica*) and paddy straw mushroom (*Volvariella volvacea*) are grown commercially in India with the white button mushroom contributing about 85% of the country's production against its global share of about 31 per cent. The production of mushroom is done throughout the year by the environmentally controlled units, but the seasonal growers come into play during the winters and the supply at the local market

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Supply at the local market exceeds causing less profit due to fall in price and spoilage due to market surplus. Mushrooms are highly perishable and get spoiled due to browning, wilting, liquefaction, loss of texture, aroma, flavour, etc, making it unsaleable. Most of the mushrooms, being high in moisture and delicate in texture, it cannot be stored for more than 24 hours at the ambient conditions prevailing in the tropics. There fore it becomes imperative to adopt scientific post harvest management practice to extend its shelf life.

### Harvesting

Mushrooms should be harvested and picked during the cooler periods of day (preferably morning or evening), while harvesting the fruiting body fingers should be used (Thumb and Fore finger) by giving clockwise and counter clockwise twist for separating the fruiting body.

Care should be taken by the growers to prevent any mechanical injury that may lead to deterioration in the quality on account of self-decomposition due to any enzymatic activity. White button mushrooms (*Agaricus bisporus*) should be harvested when the cap size of fruiting body reaches 30-45mm. Oyester mushrooms should be harvested when the margins of fruiting body curls inwards, with well-defined gills.

### Washing

Washing mushrooms in a solution consisting of oxine (50 ppm), sodium erythorbate (0.1%), and calcium chloride (0.5%) resulted in significantly lower bacterial populations and less colour deterioration during the storage. Based on experiment done at this organization and its co-coordinating centers, it has been found that washing of mushrooms in 0.05% potassium metabisulphite improved the initial whiteness, which lasted longer during the storage. Even though many farmers are adapting this approach of washing, but selling clean unwashed properly packed mushroom may be a better option, as many people prefer mushroom not just because of health benefit, but also considered it a more chemical free food. Harvested mushrooms should also be washed with sodium hypochloride (100ppm) solution to prevent microbial decomposition.

### Pre Cooling, Grading and Packaging

Harvested crop should be precooled preferably by shade cooling, forced air cooling if possible.
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Grading of mushrooms should be strictly followed as per guidelines issued by directorate of marketing and inspection as A, B and C grade
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Packaging in polyethylene pouches not less than 100 gauge with 0.5 % venting area should be followed. Other suitable packages like polyvinyl chloride and poly propylene may be preferred.
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### Storage

Storage at a temperature of 2 to 3 degree celcius is essential in refrigerated chambers for the large growers. It Prevents deterioration and microbial decomposition. Improves the colour and maintains the quality of the crop. Prevents loss of water, liquification due to enzymes, loss of texture and aroma. Maintains the nutritional status and freshness of crop. Fetches better market returns and hence improves the profitability.

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