

Mushroom processing and preservation

Post-harvest technology involves all treatments or processes that occur from time of harvesting until the foodstuff reaches the final consumer. Efficient techniques for harvesting, conveying/ transportation, handling, storage, processing/ preservation, packaging, etc are components of the post-harvest chain. It reduces the post harvest and storage losses; adds value to the product, generate employment in village and re-establishes agro-industries in rural sector. Fresh mushrooms need to be properly stored to retard post-harvest deterioration till these are consumed. In India only 2% of fruits and vegetables produced are processed as against 65% in the USA, 70% in Brazil etc.

To overcome post-harvest losses, especially during peak season, suitable post-harvest management/ practices are to be followed to retard the deterioration in quality, to increase the shelf life and marketability of mushrooms (Wakchaure, 2011a). There are two important methods of preservation

- *Short term preservation (cooling)*
- *Long term preservation*

Short term preservation (cooling)

Straw mushroom can be stored for 2days at 10 - 15°C in polythene bags (100 gauge) with 5% vent area. Other mushrooms like button, oyster and milky mushrooms are preserved at 5°C in 100 gauge polythene bags (button and milky in non-perforated and oyster in perforated). In this condition, button and milky mushroom can be stored for one week where as oyster for 3-4 days. Pre-washing may/may not be taken up before packaging. It leads to decline in shelf life and spoilage of mushroom by bacteria. However, some antimicrobial and reducing agents are used to extend shelf life.

Long term preservation

- **Brine preservation:** Mushrooms are sorted, washed, trimmed and blanched for 3 minutes in 2% salt solution and 0.1% acetic acid and stored in 5% salt solution containing 0.2% acetic acid and 0.1% potassium meta bisulphate in glass bottles.



- **Drying:** Mushroom contains about 90% moisture at the time of harvesting and are dried to maintain 10-12%. Drying at 55-60°C, the insects and microbes are killed. The dehydrated product at low moisture percentage increases the shelf life of mushroom. Oyster, shitake, paddy straw and black ear are being dried in sun or in cabinet drier which increases the shelf life upto 6months.



- **Canning:** Canning is the technique by which the mushrooms can be stored for longer periods up to a year. The caning process can be divided into various unit operations namely cleaning, blanching, filling, sterilization, cooling, labeling and packaging.

In this process the whole mushrooms are washed 3-4 times in cold running water to remove adhering substances. The mushrooms are blanched with a solution of 0.1% citric acid and 1% common salt from 5-6 minutes at 95-100°C to inhibit polyphenol oxidase enzymes activity, inactivate microorganisms, remove the gases from the mushroom tissue and reduce bacterial counts. Thereafter, blanched mushrooms are filled in tin cans in brine solution (2% salt and 0.1% citric acid) at 90°C. The cans are exhausted for 10-15m after lidding loosely, sealed, sterilized at 15psi for 25-30minute, cooled and labeled.



Value added soup powder



Pickles

Flow chart for canning

Mushrooms–Grading- Brining-Storage-Slicing- Labeling-Drying-Washing- Packaging

CLEANING AND WASHING

(in water containing 0.1% citric acid / 0.3% sodium meta bi-sulphite)



BLANCHING

(cooking in steam or hot water at about 98° C for 7-8 minutes in water containing 1% sodium chloride and 0.1% citric acid).



CANNING (FILLING, WEIGHING, BRINING AND EXHAUSTING)

(in brine solution, 1% sodium chloride and 0.25% citric acid or ascorbic acid - Temp 78 -98°C)



SEALING



SEAMING



STERILIZATION



COOLING

(to bring down the temperature to 35°C)



LABELING



PACKAGING