

ಅಣಬೆ ಸಂಸ್ಕರಣೆಯಲ್ಲಿ ಯಾಂತ್ರಿಕತೆ ಮತ್ತು ಬೈಯೋಗಿಕರಣಕ್ಕಾಗಿ ಸರ್ಕಾರ ಮತ್ತು
ವಿವಿಧ ಇಲಾಖೆಗಳ ಸೌಲಭ್ಯಗಳು

Speaker

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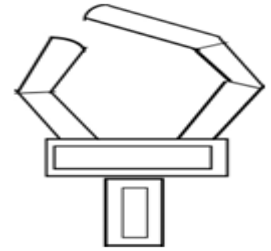
Harvesting

Mostly manual harvesting is done. Picking of mushroom is similar to picking a apple

Picking them at right stage using a twist-pull method to avoid damaging the substrate



Two finger robot

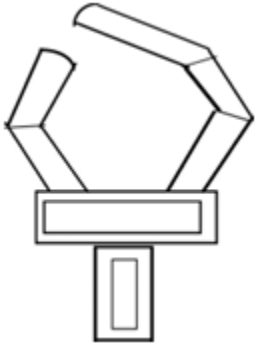


A mushroom harvesting robot is explored that uses inverse kinematics at the target position..

To compute the state of a robotic hand for grasping a ripening mushroom and plucking it.

The speed of harvesting is greater, so the duration of harvesting is less

Two finger robot



The speed of harvesting is greater, so the duration of harvesting is less

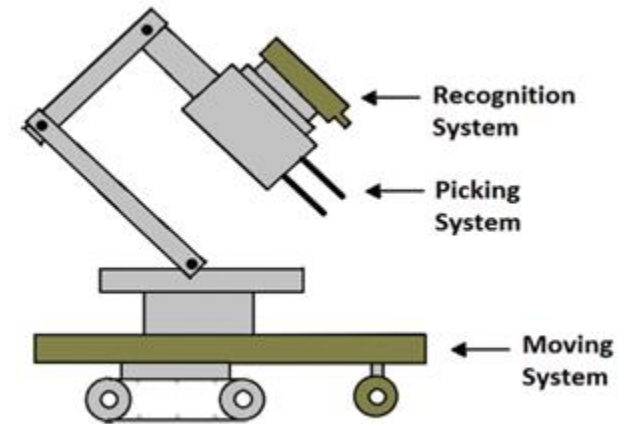
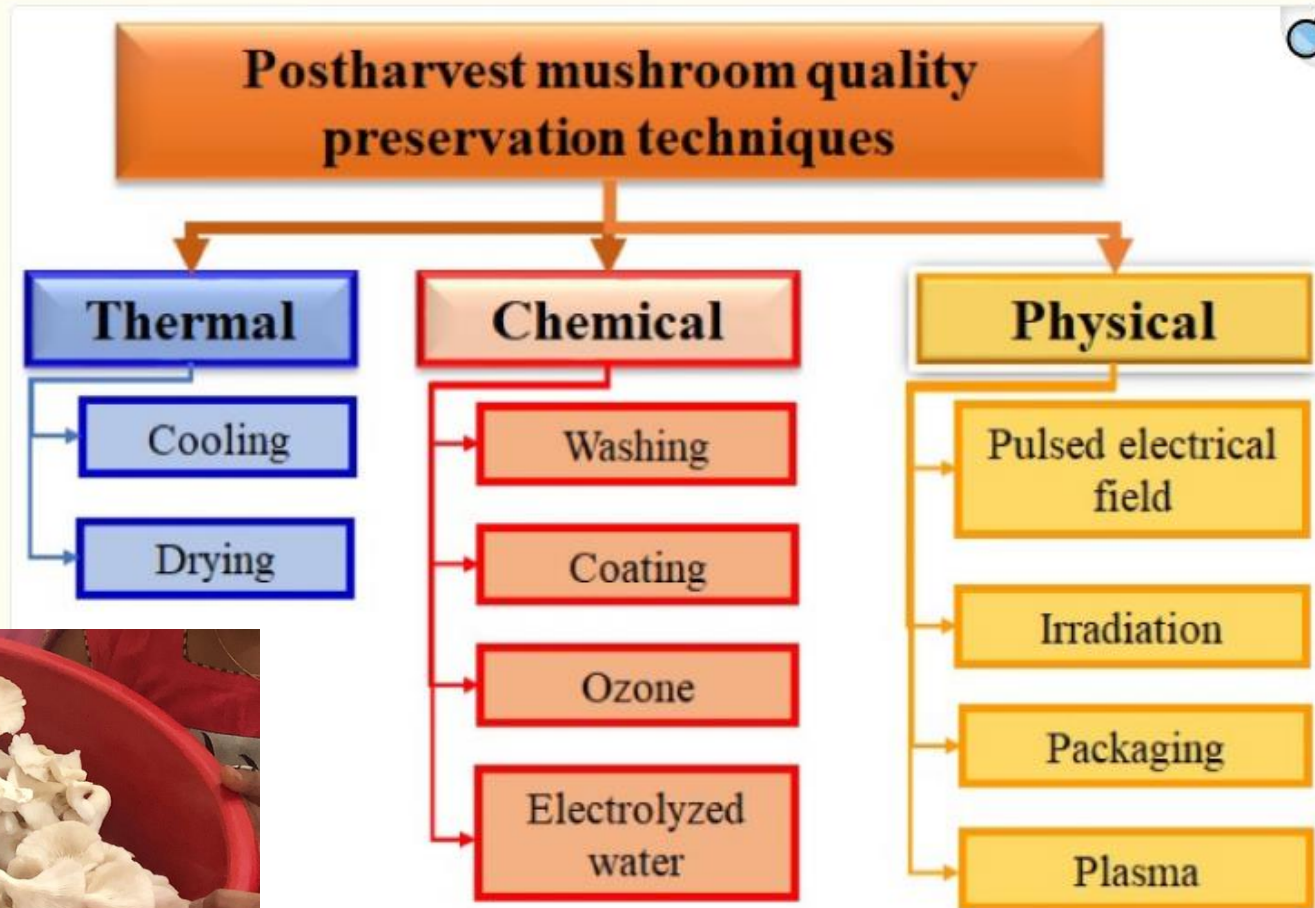


Figure 1. Schematic of a harvesting robot.





Post Harvest Management



Traditional Methods followed (Washing, Blanching and Drying)



Traditional Methods followed



Preparing for Drying



Shade dried Oyster Mushroom



Cooling



To extend their shelf life.

To reduce the respiration rate of mushrooms, and minimizing their moisture loss.

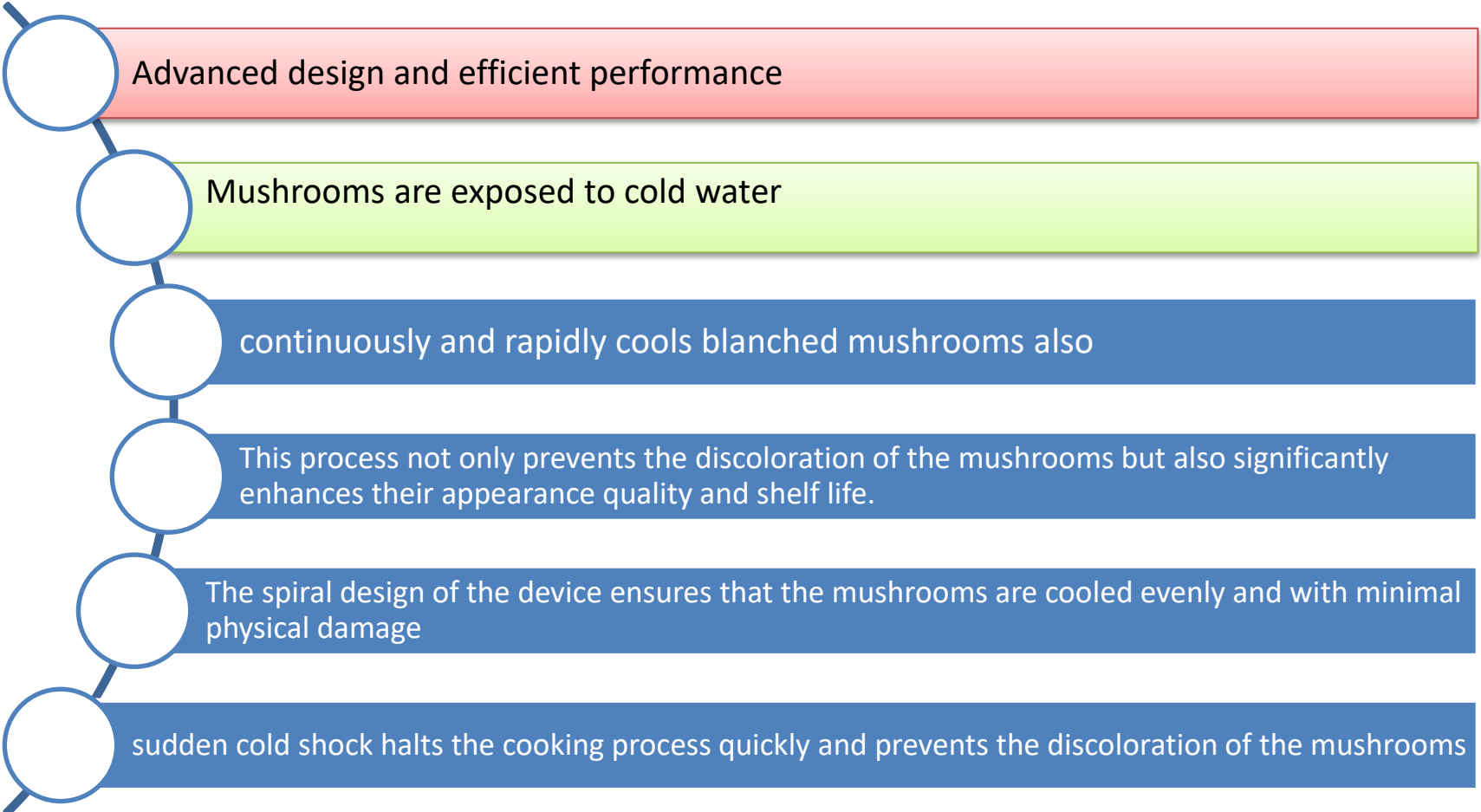
To reduce storage temperature from 25 to 3 °C, (75% less browning was obtained in the mushrooms)

To increase the total phenols content in mushrooms stored under fluorescent light increased significantly during 10 days of refrigeration.

Mushroom spiral cooling machine



Mushroom spiral cooling machine



Advanced design and efficient performance

Mushrooms are exposed to cold water

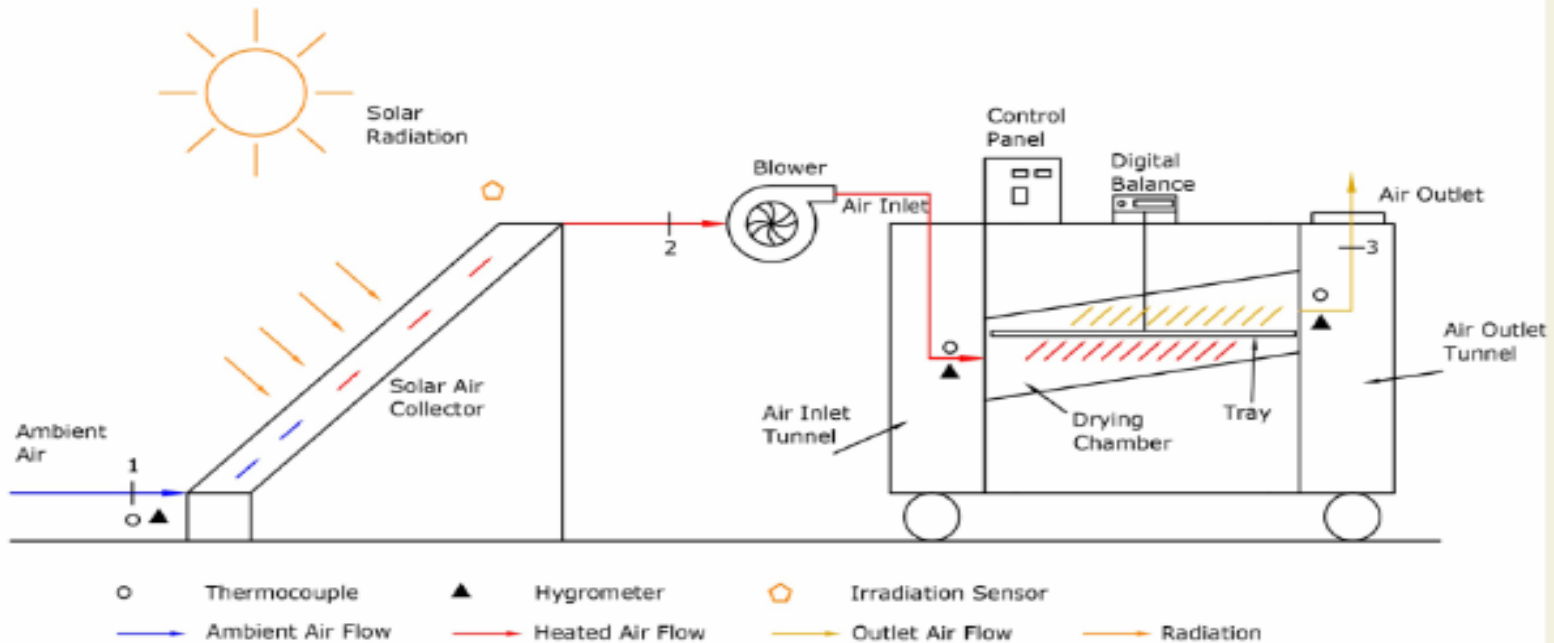
continuously and rapidly cools blanched mushrooms also

This process not only prevents the discoloration of the mushrooms but also significantly enhances their appearance quality and shelf life.

The spiral design of the device ensures that the mushrooms are cooled evenly and with minimal physical damage

sudden cold shock halts the cooking process quickly and prevents the discoloration of the mushrooms

Solar Drying (45-50°C)



Solar Tunnel Dryer





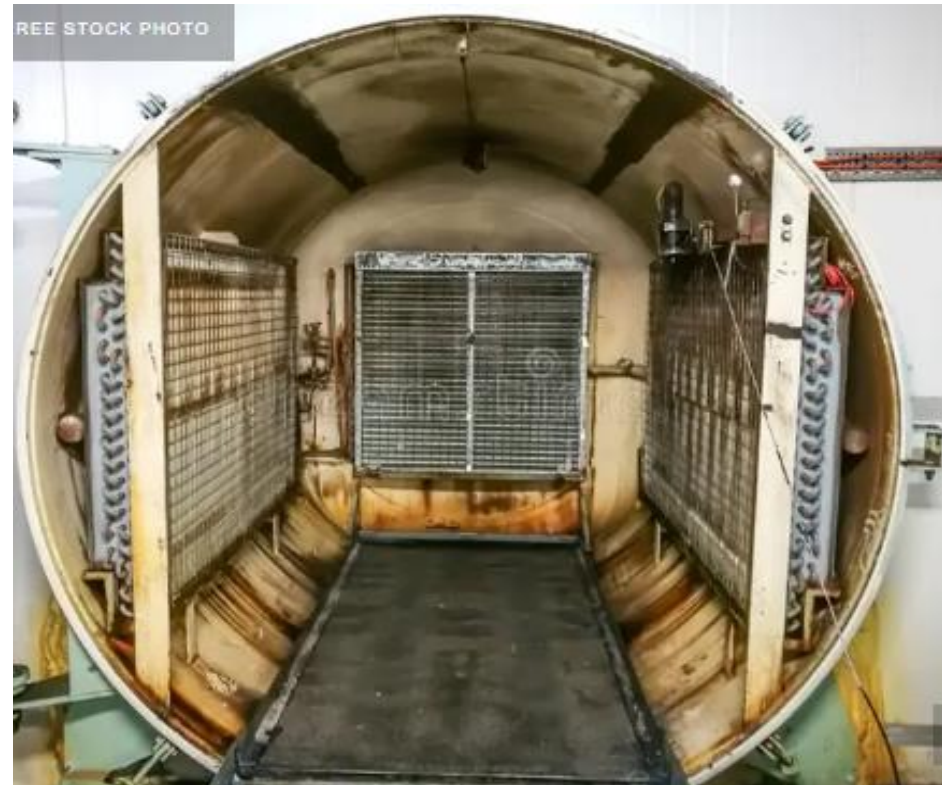
Solar Tunnel Dryer developed at Junagadh (Gujarat)-Heat intensity is increased from 30to 45% than open heat sun's heat (30 to 45% drying period is reduced)



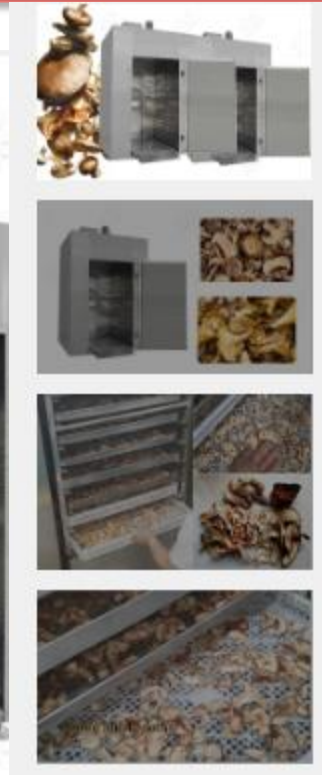
Solar Tunnel Drying of Red chilies, turmeric and ginger

Vacuum Cooling Machine

A Vacuum cooling machine for mushroom, process works by the rapid evaporation of water from produce under low-pressure situations. The Vacuum cooling machine for mushroom, process works by the rapid evaporation of water from produce under **low-pressure situations** is extremely fast reducing cooling times in 15 minutes.



Mushroom Dehydrator/Drying Machine



Features of Mushroom Drying/Dehydrated Machine



The machine is automatic and computer control system

Normal steam pressure: 0.2-0.8Mpa.

Demand for operating temperature is higher than 140°C or lower than 60°C

Drying trollies and trays are standard size and can be exchanged for other usage

Features of Mushroom Drying/Dehydrated Machine



uses a low noise and high temperature proof axial flow blower and an automatic temperature control system.

The whole circulation system is the fully enclosed

Heat efficiency of the drying oven increases from 3%~7% of the traditional drying oven to 35~45%.

It takes about 11 hours to dry mushrooms.

Chemical Processing

Mushroom Washing Device



proper and hygienic washing of products is a critical step that directly impacts the final quality, consumer health, and product shelf life

This device utilizes a combination of bubble-making technology and water pressure to thoroughly and hygienically wash mushrooms

The device's unique design, including a double-walled washing tank and hinged doors, ensures ease of washing and cleaning

These features not only enhance the washing quality but also increase productivity and user convenience

The output vibration system helps separate broken or sliced mushroom pieces and directs the final product for further processing

Mushroom Washing Machine



Mushroom Packing Machine

High Speed Mushroom Packing machine 60pcs/min

Wrapping Speed: 20 – 60 packs per minute

Compact Design: Space-saving & highly efficient

User-Friendly Interface: Color touch panel with multilingual support



※ This photo is the machine with online



Mushroom Packing Machine

- **Versatile Use:** Suitable for eggplants, bell peppers, asparagus, cucumber, pumpkin, mushroom bunches, cut vegetables, and other tray-packed items
- **Smart Features:** Error display, memory for 100 product settings, auto feeder compatibility, optional labeller and shrink options
- **Tool-Free Cleaning:** Detachable and washable conveyor system



Technical Specifications:

Mushroom Packing Machine

Machine Dimensions: L 3050 mm × W 890 mm × H 1235 mm

Power Consumption: 3-Phase, 3.3 KVA

Wrapping Film Speed: Up to 30 m/min

Max. Film Width: 500 mm

Max. Tray Size: L 150–400 mm, W 80–210 mm, H 15–60 mm

Product Height: 10–90 mm

Machine Weight: 500 kg

Air Supply: Not required

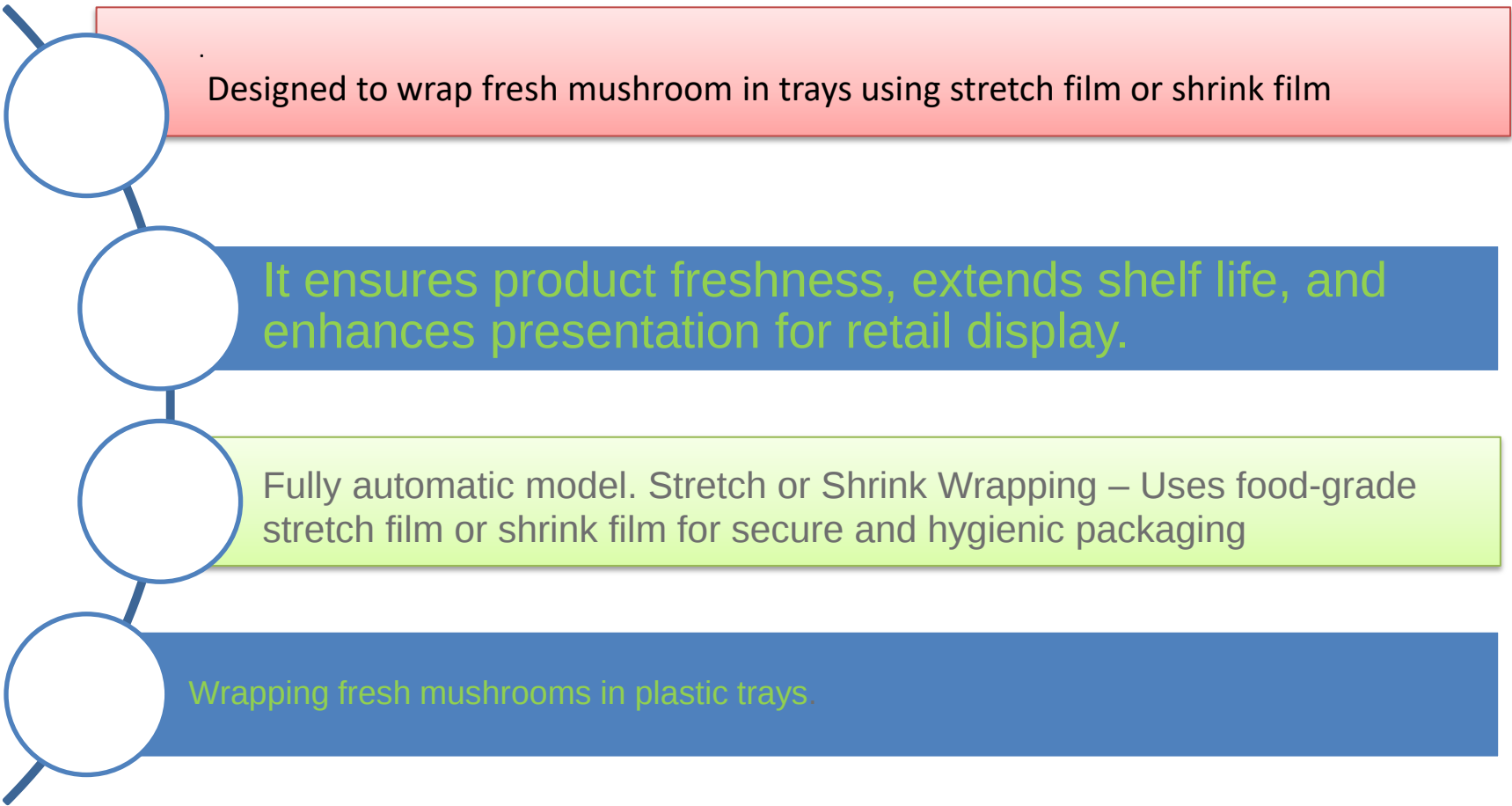
Automatic Mushroom Wrapping Machine

To wrap fresh mushrooms in trays using stretch film or shrink film.

It ensures product freshness, extends shelf life, and enhances presentation for retail display.



Automatic Mushroom Wrapping Machine



The diagram illustrates the process of an Automatic Mushroom Wrapping Machine. It features a vertical line of four white circles connected by a blue line. Each circle is connected to a colored rectangular box containing text. The boxes are colored red, blue, light green, and blue from top to bottom. The text describes the machine's purpose, benefits, and operation.

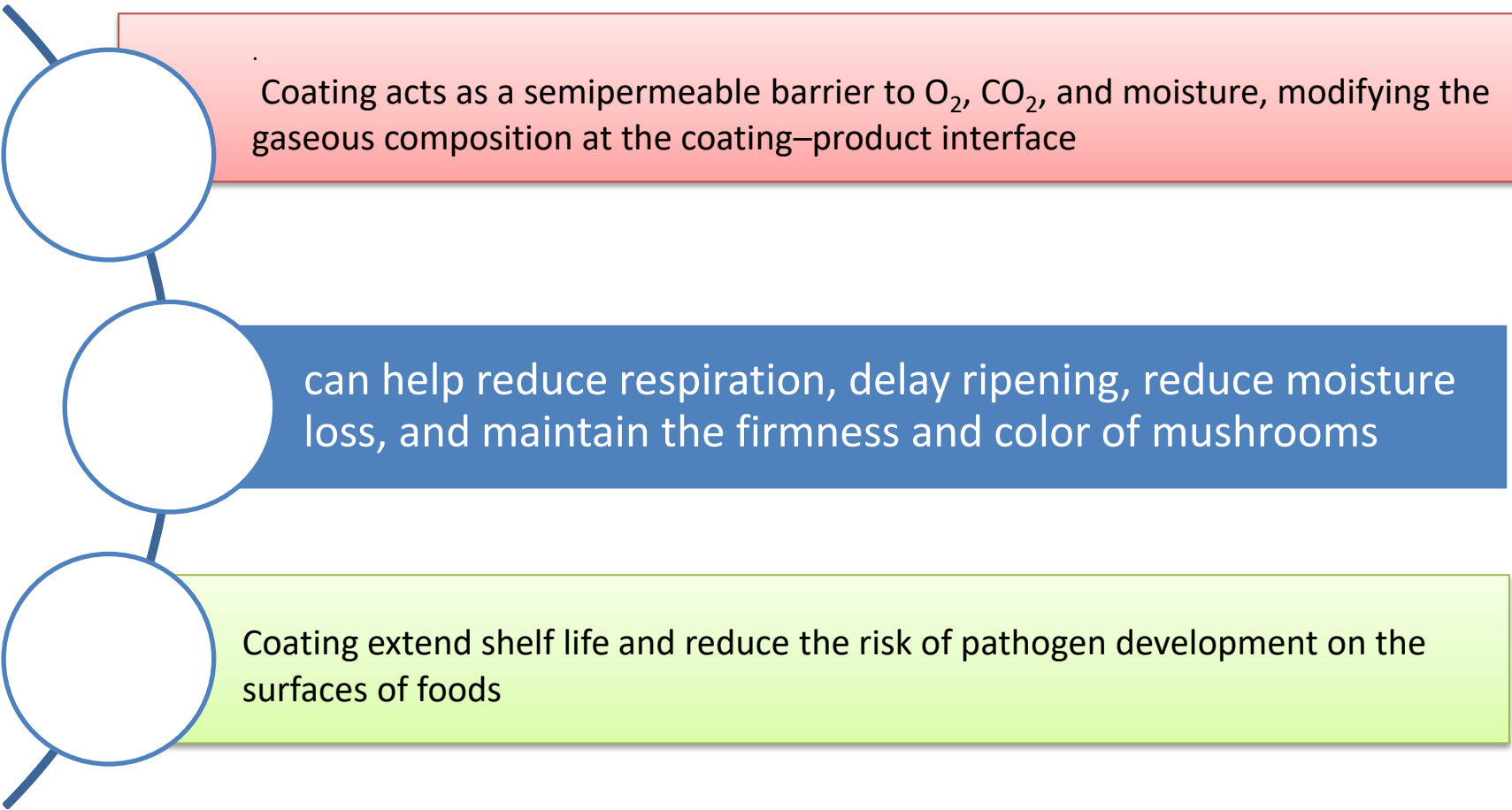
Designed to wrap fresh mushroom in trays using stretch film or shrink film

It ensures product freshness, extends shelf life, and enhances presentation for retail display.

Fully automatic model. Stretch or Shrink Wrapping – Uses food-grade stretch film or shrink film for secure and hygienic packaging

Wrapping fresh mushrooms in plastic trays.

Mushroom Coating



Coating acts as a semipermeable barrier to O_2 , CO_2 , and moisture, modifying the gaseous composition at the coating-product interface

The diagram features three white circles with blue outlines, each with a short blue line extending from its top-left. These circles are connected by a vertical line and are positioned to the left of three colored rectangular boxes. The top box is light red, the middle is blue, and the bottom is light green. Each box contains text describing a benefit of mushroom coating.

can help reduce respiration, delay ripening, reduce moisture loss, and maintain the firmness and color of mushrooms

Coating extend shelf life and reduce the risk of pathogen development on the surfaces of foods

Mushroom Ozone treatment

The ozone pre-treatments combined with the packaging condition was effective in extending the shelf life of the mushrooms up to 10 days

Ozone is a powerful antimicrobial agent used to extend the shelf life of food. Due to its strong oxidizing ability, ozone produces rapid microbial inactivation by reacting with intercellular enzymes and cellular components.

Electrolyzed water

Electrolyzed water is a promising broad-spectrum disinfectant that can be used in the food industry . It is generated by electrolysis of a saline solution, and its antimicrobial activity is determined by the concentration of free available chlorine that forms hypochlorous acid (HClO),

Pulsed light

Pulsed light (PL) is a non thermal technology used for rapid inactivation of pathogenic microorganisms to prevent food spoilage. It has been approved as a decontamination technology by the FDA. This technique consists of applying short-duration, intense pulses of a broad spectrum of light onto the surface of the food for microbial inactivation

Gamma irradiation treatment

Gamma irradiation of several products has been approved as safe by the FDA. A dose of up to 1 kGy has proven useful to maintain the quality and extend the shelf life of edible mushrooms, producing a decrease in enzymatic browning due to a delay in the activity of polyphenol oxidase

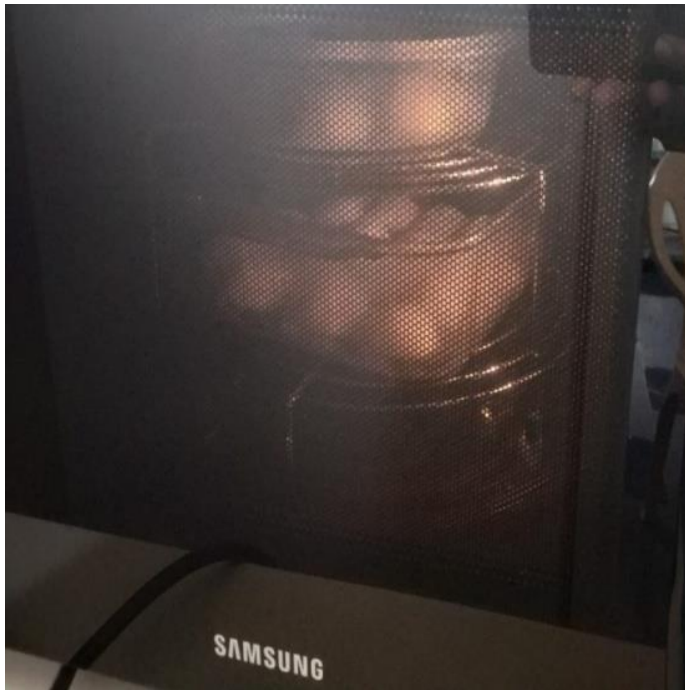
Plasma

Cold plasma is considered an emerging technology that can be a potential alternative to conventional preservation techniques . Plasma is an **ionized gas** that is produced by the application of **an electric or electromagnetic field** to a gas (air, oxygen, nitrogen, argon, helium), making the electrons collide with the molecules or atoms of the gas and producing ionization.

Machineries required for Mushroom product preparation



Mushroom Cookies and Soup





Thank You

All the Best

ಇದೇ ಹರವಿನಹಳ್ಳಿ ತೋಟಗಾರಿಕೆ, ತೋರಿದು ದೇಶಕ್ಕಾಗಿ ಹೋರಾಡಿ ಮರಣವನ್ನಪ್ಪಿದ ಗೌರವಿಸಲಾಗುತ್ತದೆ.

ಅಣಬೆ ಬೆಳೆದು ಆದಾಯ ಗಳಿಸಿ: ಶಶಿಕಲಾ

■ ಉದಯವಾಣಿ ಸಮಾಚಾರ

ಚಿತ್ರದುರ್ಗ: ಇತ್ತೀಚಿನ ದಿನಗಳಲ್ಲಿ ಅಣಬೆಗೆ ಹೆಚ್ಚಿನ ಬೇಡಿಕೆ ಇದ್ದು ಎಲ್ಲಾ ಬದುಕುಗಳಲ್ಲೂ ಬೆಳೆದು ಅಣಬೆಯ ಗಳಿಸಬಹುದಾಗಿದೆ ಎಂದು ಹಿರಿಯೂರು ತೋಟಗಾರಿಕೆ ಮಹಾವಿದ್ಯಾಲಯದ ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕಿ ಡಾ.ಡಿ. ಶಶಿಕಲಾ ಬಾಯಿ ಹೇಳಿದರು.

ತಾಲೂಕಿನ ಗೊಡಬನಾಳ್ ಗ್ರಾಮದಲ್ಲಿ ತಿಮ್ಮಮೊಗ್ಗದಕೆರೆದಿವಪನ್ನಾಯಕಕೃಷಿಮತ್ತು ತೋಟಗಾರಿಕೆ ವಿಜ್ಞಾನಗಳ ವಿಶ್ವವಿದ್ಯಾಲಯ ವ್ಯಾಪ್ತಿಯ ಹಿರಿಯೂರು ತೋಟಗಾರಿಕೆ ಮಹಾವಿದ್ಯಾಲಯದ ಅಂತಿಮ ವರ್ಷದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಯೋಜಿಸಿರುವ ಗ್ರಾಮೀಣ ಕೃಷಿ ಕಾರ್ಯಾನುಭವ ಕಾರ್ಯಕ್ರಮದ ಅಂಗವಾಗಿ ತರಬೇತಿ, ಪ್ರಾತ್ಯಕ್ಷಿಕೆ ಮತ್ತು ಅಣಬೆ ಬೇಸಾಯ ಹಾಗೂ ಮಾರುಕಟ್ಟೆಯ ಮಾರ್ಗೋಪಾಯಗಳು ಕಾರ್ಯಕ್ರಮ ಉದ್ಘಾಟಿಸಿ ಅವರು ಮಾತನಾಡಿದರು. ಪ್ರಧಾನಮಂತ್ರಿಗಳ ಕಿರು ಆಹಾರ ಸಂಸ್ಕರಣಾ ಉದ್ದಿಮೆಗಳ (ಪಿಎಂಎಫ್‌ಎಂಇ) ಯೋಜನೆಯಡಿ ಸಬ್ಸಿಡಿಯೊಂದಿಗೆ ಸಾಲ ಸೌಲಭ್ಯ ಪಡೆದು ಉದ್ದಿಮೆ ಆರಂಭಿಸಬಹುದಾಗಿದೆ ಎಂದರು.

ತರಕಾರಿ ವಿಜ್ಞಾನ ವಿಭಾಗದ ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕಿ ಡಾ.ಶಶಿಕಲಾ ಗೊಂಡಿಮಾತನಾಡಿ, ಸಸ್ಯಹಾರಿ ಅಣಬೆಯಲ್ಲಿ ಔಷಧೀಯ ಗುಣಗಳಿರುವುದರಿಂದ ಇತ್ತೀಚಿನ ದಿನಗಳಲ್ಲಿ ಇದರ ಬಳಕೆ ಹೆಚ್ಚಾಗಿದೆ. ವಿಟಮಿನ್, ಕ್ಯಾಲ್ಸಿಯಂ ಪ್ರಮಾಣ ಅಧಿಕವಾಗಿದೆ. ಸ್ವನ-



ಚಿತ್ರದುರ್ಗ: ತಾಲೂಕಿನ ಗೊಡಬನಾಳ್ ಗ್ರಾಮದಲ್ಲಿ ಅಣಬೆ ಬೇಸಾಯ ಕುರಿತು ತರಬೇತಿ, ಪ್ರಾತ್ಯಕ್ಷಿಕೆ ನೀಡಲಾಯಿತು.

ಕ್ಯಾನ್ಸರ್ ಸೇರಿದಂತೆ ಮಹಿಳೆಯರಿಗೆ ಸಂಬಂಧಿಸಿದ ನಾನಾ ಕಾಯಿಲೆಗಳಿಗೆ ಅಣಬೆ ರಾಮಬಾಣವಾಗಿದೆ. ಇತ್ತೀಚಿನ ದಿನಗಳಲ್ಲಿ ದುಡಿಯುವುದು ಹಾಗೂ ಗಳಿಸುವುದು ಹೆಚ್ಚಾಗುತ್ತಿದ್ದು ಆರೋಗ್ಯದ ಬಗ್ಗೆ ಲಕ್ಷ್ಯ ಕಡಿಮೆಯಾಗುತ್ತಿದೆ. ಹಾಗಾಗಿ ಮುಖ್ಯವಾಗಿ ಮಹಿಳೆಯರು ಅಣಬೆ ಸೇವಿಸುವುದರಿಂದ ಆರೋಗ್ಯ ಕಾಪಾಡಿಕೊಳ್ಳಬಹುದು ಎಂದು ಸಲಹೆ ನೀಡಿದರು.

ಅಣಬೆ ಉದ್ದಿಮೆದಾರ ಪ್ರಜ್ವಲ್ ಕೃಷ್ಣ ಮಾತನಾಡಿ, ಮದರ್ ಎಂಟರ್‌ಪ್ರೈಸಸ್ ಮೂಲಕಕರ್ನಾಟಕದಾದ್ಯಂತಅಣಬೆಹಾಗೂ ಅಣಬೆಪೊಡರನ್ನುಕಾಂಟ್ರಾಕ್ಟ್‌ಫಾರ್ಮಿಂಗ್ ಮೂಲಕ ಖರೀದಿಸಲಾಗುತ್ತಿದೆ. ನಮ್ಮ ಸಂಸ್ಥೆಯಿಂದ ಅಣಬೆ ಬೆಳೆ ಕುರಿತು ತರಬೇತಿ ನೀಡಲಾಗುತ್ತದೆ. ಬೆಂಬಲ ಬೆಲೆಯೊಂದಿಗೆ ಅಣಬೆಬೆಳೆಗೆಮಾರುಕಟ್ಟೆಬದಗಿಸಲಾಗುತ್ತಿದೆ.

ಹಾಗಾಗಿ ರೈತರು ಅಣಬೆ ಬೆಳೆಯಲು ಮುಂದಾಗಬೇಕು ಎಂದು ಹೇಳಿದರು. ತುಮಕೂರಿನ ರೇಣುಕಾ ಮಾತನಾಡಿ, ತುಮಕೂರು ತೋಟಗಾರಿಕೆ ಇಲಾಖೆಯಲ್ಲಿ ಒಂದು ತಿಂಗಳು ಮಾಸ್ಟರ್ ತರಬೇತಿ ಮಾಡಿಕೊಂಡಿದ್ದು ಅಣಬೆ ಬೇಸಾಯ ಮಾಡುತ್ತಿದ್ದೇನೆ. ತಿಂಗಳಿಗೆ 50ರಿಂದ 60 ಸಾವಿರ ಆದಾಯ ಗಳಿಸುತ್ತಿರುವುದಾಗಿ ತಿಳಿಸಿದರು. ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ಹಿರಿಯೂರು ತೋಟಗಾರಿಕೆ ಮಹಾವಿದ್ಯಾಲಯದ ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕಿ ಡಾ. ರಾಜಶೇಖರ ಬಾರಕೇರ, ಗ್ರಾಮದ ಮುಖಂಡರಾದ ಆಶೋಕ್, ಜಿ.ಪಿ. ಮಲ್ಲೇಶ್ವ ಪ್ರಸನ್ನಕುಮಾರ್ ಮತ್ತಿತರರು ಭಾಗವಹಿಸಿದ್ದರು. ಇದೇ ಸಂದರ್ಭದಲ್ಲಿ ಅಣಬೆ ಬೇಸಾಯದ ಕುರಿತು ರೈತರು ಹಾಗೂ ಗ್ರಾಮಸ್ಥರಿಗೆ ಪ್ರಾತ್ಯಕ್ಷಿಕೆ ನೀಡಲಾಯಿತು.



Solar Tunnel Dryer

As its name suggests, the tunnel dryer is a semi-cylindrical tunnel-shaped dryer. The frame of the structure is made of galvanized iron and covered with ultraviolet (UV) stabilized polythene sheet of 200-micron size, which maintains heat inside the dryer. While the inlets at the back end of the dryer allow fresh air to enter the dryer, the exhaust fan, fitted at its front side removes the moist air from the product. This type of dryer is used for drying sago, coconut, chillies, amla, onions, and other agricultural products

Mushroom Drying

100 kg 12 trays size 2x2 feet

Perforated trays

Cost 75,000+gst

The full form of **1 kGy** is **1 kilogray**.

- **Definition:** It is a unit of absorbed radiation dose.
- **Value:** 1 kGy equals 1,000 Gray (Gy).
- **Energy Equivalent:** 1 kGy is equivalent to 1,000
• Joules per kilogram (J/kg) or 1 Kilojoule per kilogram