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Technologies for Processing of Tender Jackfruit, Grape Raisins, and Minimal Processing of Vegetables

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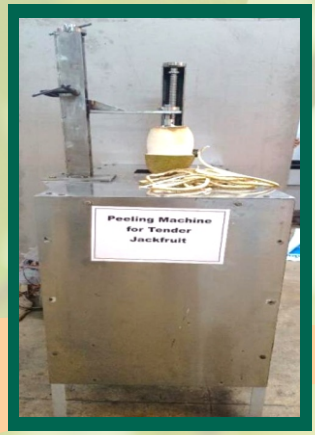
Technology Package for Tender Jackfruit Processing

Salient Features of the Technology

- Suitable for minimal processing and powder production from tender jackfruit
- Plant machinery consists of Peeling machine, Cutting cum anti-browning treatment system, Shredding machine and Cold grinding unit
- Plant input capacity: 120-130 kg/h
- Capital cost: 5 lakhs
- Cost of production: Rs. 26/kg (for minimal processing); Rs. 115/kg (for powder)

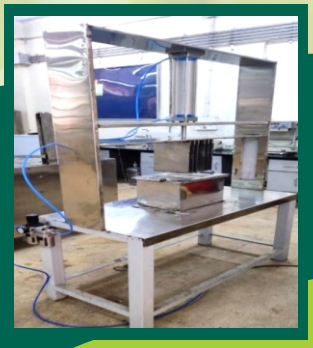


Peeling Machine

- Power source: Electric motor (0.74 kW)
- Capacity: 120 -130 kg/h
- Peeling efficiency: 96.57 %
- Peeling loss : 2.80 %

Washing cum Ozone Treatment System

- Capacity: 100-120 kg/h
- Aqueous ozone treatment (1 ppm, 10 min)
- Environment friendly treatment



Cutting cum Anti-browning Treatment

- Pneumatically operated
- Operating Pressure: 70 kN/m2
- Capacity: 130 -135 kg/h
- Anti-browning treatment: Ascorbic acid

Minimally Processed Tender Jackfruit

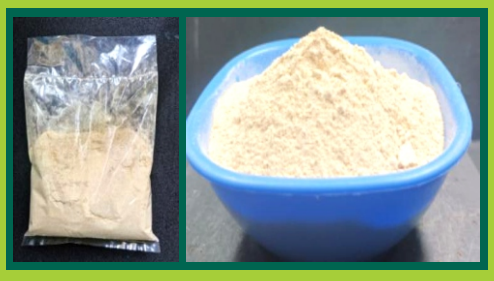
- Processed with green techniques (Ozone and ascorbic acid)
- Shelf life: 9 days at refrigerated conditions

Shredding Machine

- Power source: Electric motor (0.74 kW)
- Capacity: 100 -110 kg/h
- Operating speed: 175 rpm

Cold Grinding Unit

- Capacity: 25 kg/h
- Power source: Electric motor (0.37 kW)
- Cooling medium: Chilled water



Tender Jackfruit Powder

- Nutrition rich (ascorbic acid, total phenolic content and dietary fiber)
- Applications: Bread and bakery products
- Storage life: 10 months at ambient content
- No artificial preservatives

Equipment and Process Technology for Production of Chemical Free Grape Raisin

Salient Features of the Technology

- No use of chemicals in the process of raisin production
- Reduction in drying time by 30-40%
- Reduction in processing cost (by 20-25 %) compared to chemical process
- Suitable to produce organic raisins (if production is organic)

Process Flow Chart

Harvested Grapes

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De-bunching

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Abrasive Pre-treatment

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Drying

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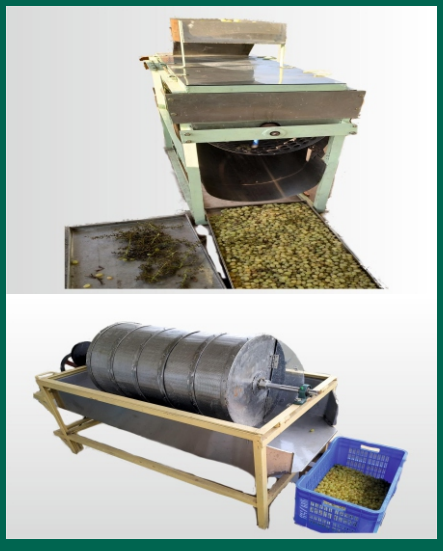
Raisins

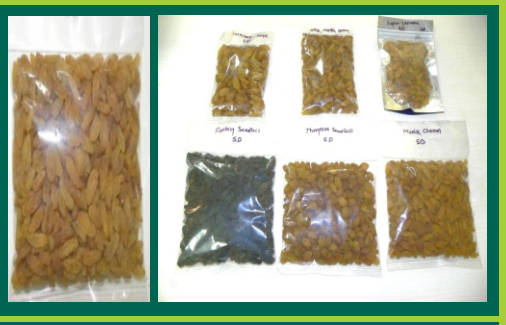


Grape De-bunching Machine

- Purpose: Detachment of intact berries from grape bunch
- Output capacity: 140-150 kg/h
- Power source: 1.5 kW motor
- Rotational speed: 80-100 rpm
- De-bunching efficiency : 95-96 %

Abrasive Pre-treatment Equipment

Purpose: Removal of waxy cuticle layer from surface of grape berries.
Output capacity: 140-150 kg/h
Power source: 0.745 kW motor
Rotational speed: 15-17 rpm
Treatment time: 3-5 min
Abrasive treatment efficiency: 97.65 %



Drying of Grapes

- Drying time: 5-7 days (solar drying); 2-3 days (Tray drying, Temperature: 50-55°C)
- Overall 30-40 % reduction in drying time compared to conventional chemical process

Cost Details

- Grape de-bunching machine : Rs. 70,000/-
- Abrasive pre-treatment equipment : Rs. 1,50,000/-
- Processing cost: 30 % lesser compared to chemical process due to saving of cost of chemicals

Potential User

- Raisin processors, New entrepreneurs

Commercialization

- Licensed to M/s Vishwarup Agro Foods Pvt., Ltd, Sangli, Maharashtra,

Pilot Plant for Minimal Processing of Fruits and Vegetables

Process Flow Chart

Harvested fresh fruits/vegetables

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Preparation (Removal of inedible portions)

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Cutting/peeling/Trimming

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Washing cum ozone treatment

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Surface drying (Spin dryer)

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Weighing, sealing into pouches and sealing

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UV treatment

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Storage/Marketing

Salient Features of the Technology

- Plant is suitable for minimal processing of fruits and vegetables
- Pilot plant includes plant machinery like Vegetable washer, Cutter/Slicer, Ozone treatment system, Basket centrifuge, UV treatment system and packaging machine.
- Plant capacity: 100 kg/h
- Use of non-thermal green processing techniques like Ozone and UV light
- Capital investment: 10 lakhs
- Working capital: 5 lakhs/month
- Cost of production: Rs. 25.80/kg

Washing cum treatment tank

- Suitable for washing and ozone treatment
- Titanium dome ozone diffuser is fixed in the tank for making ozonated water
- It has also provision for air bubbles for proper agitation of materials during treatment

Ozone treatment system

- Oxygen Concentrator: Capacity: 5 l/min
- Ozone Generator: Capacity: 10 g/h

Cutting machine

- Cauliflower floret cutter
- Suitable for cutting the cauliflower into florets (20-40 mm size)
- Operated by 0.37 kW electric motor
- Multipurpose cutter cum slicer
- Suitable for cutting, slicing, shredding and dicing of fruits/vegetables

Centrifuge basket

- Removes the water accumulated in the cut vegetables by means of the centrifugal action
- Operating speed: 700 rpm

UV treatment system

- UV-C light (wavelength: 254 nm) for surface treatment of the packaged food.
- UV has germicidal effect hence it sterilizes the product

Packaging unit

- Band sealer
- Seals the packet while it is vertically passing over the belt

Commercialization

- Offered in ABI and adopted by M/s Avl's Hazfree Farm Products, Bhopal