



Punjab Horticultural Postharvest Technology Centre Punjab Agricultural University, Ludhiana

PHPTC Newsletter

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Postharvest Handling Techniques for Okra

Introduction

Okra (*Abelmoschus esculentus*), widely known as lady's finger, is a versatile and nutritious vegetable valued for its tender pods. In the year 2023-24, the area under okra cultivation in India was 5.54 lakh hectares, with a total production of 72.88 lakh metric tonnes and a productivity of 13.14 metric tonnes per hectare (India stat, 2024). India, as the world's largest producer of Okra (contributing about 62% of global production), has significant export potential for this vegetable, driven by increasing international demand, particularly in North America, Europe, and the Middle East. In the year 2023-24, India has exported 1.64 lakh metric ton of okra worth USD 24.31 million. The primary destinations for Indian okra exports include United States, United Kingdom, Canada, Australia, United Arab Emirates etc (APEDA, 2024).

Nutritional importance:

Okra, a low-calorie vegetable, is a nutritional powerhouse packed with essential nutrients. The following nutritional profile is based on data from the United States Department of Agriculture (USDA)

Nutrient	Amount per 100g
Calories	33 kcal
Protein	1.9 g
Total Fat	0.2 g
Carbohydrates	7.5 g

Dietary Fiber	3.2 g
Calcium	82 mg
Iron	0.6 mg

Its culinary appeal and health benefits have made it a staple in global cuisines, driving demand in both fresh and processed markets. However, okra's high perishability poses significant challenges in maintaining its quality after harvest. Effective post-harvest handling techniques are essential to preserve the pod freshness, texture and nutritional integrity. Harvesting at the optimal stage, careful handling to prevent bruising, rapid cooling and storage are critical practices to minimize moisture loss, prevent discoloration and extends shelf life. By adopting these techniques, stakeholders can reduce post-harvest losses, meet market standards and enhance the economic value of this nutrient-dense crop.



Fig. 1. Flow chart of okra post-harvest operations

Maturity indices

- Okra pods are harvested within 6-7 days after flower opening/pod set.

- The pods should be harvested when the pods are
 - ✓ young, green, tender, crisp, and with less fiber content (not higher than 7%)
 - ✓ not more than seven days after pod set
 - ✓ Pod tips (blossom ends) snap readily when bent

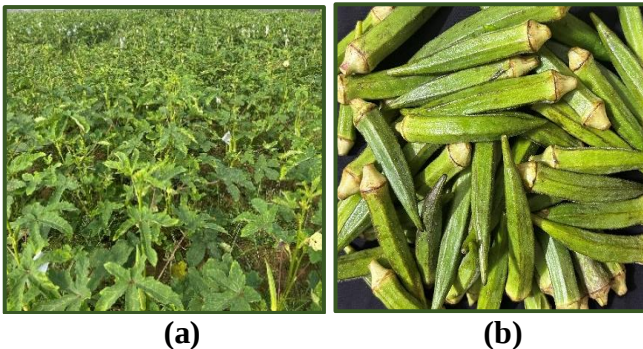


Fig. 2. (a) Field view of okra (b) Okra after harvesting

Harvesting

- The pods have to be harvested every one or two days due to the rapid rate of growth and specific pod size requirements
- For export purpose, the okra pods should be green, tender, 4–5 ridged and about 6–8 cm in length
- Cut the stem just above the cap with a knife. If the stem is too hard to cut, the pod is probably too old and should be tossed.
- Okra pods are commonly harvested by hand with approximately 0.5 to 1 cm of pedicel and placed in a suitable container.



Fig.3. Harvesting of okra

- Sacks or bags should not be used as these incur damage and cause heat build-up as the respiration rate of okra is very high
- Bamboo baskets damage the pods and cause blackening of edges.

- Clean ventilated shallow crates should be used for collecting the pods and place them in the shade.
- Polyethylene film liners are used in filled containers to reduce the rate of dehydration.
- Okra should not be harvested in the rain or when excessively wet.
- The pods should be harvested by clipping instead of pulling, to avoid damage and darkening of pod edges. Pods should be handled with care and rubber or cotton hand gloves can be used while harvesting and handling to avoid mechanical injury which later show up as dark discoloration of pod edges lowering the marketing quality.

Cleaning and Sorting

- Oversize and damaged pods are to be removed from the plant and sorted out in the field. Pods showing discoloration, bruising (blackening of the ridges), chemical residue or insect damage, are sorted out while grading. Okra fruits are graded by hand on moving conveyors or standard grading tables.
- The pods should be fresh, green, firm, free from debris.
- Should have tender tips that snap readily. Length of the pod should be 8-12 cm free from dark discoloration.
- Free from disease, bird or insect damage.
- Should have stalks cut cleanly.



Fig.4.Sorting of okra in pack-house

Grading

- Okra can be graded according to following classes as per Directorate of Marketing and Inspection (DMI):-

Size Code	Length (cm)
A	4.01 – 6.50
B	6.51 – 9.00
C	9.01 – 11.50
D	11.51 and above



Fig. 5. Okra before grading



Fig. 6. Okra after grading

- The pods can be pre-packed in polyethylene bags of 100gauge thickness having 0.5% ventilation and master packed in CFB boxes using paper shreds as cushioning at the bottom for storage at ambient temperature.

Storage

- Okra is sensitive to both high and low temperatures during storage and marketing resulting in rapid deterioration of the pods.
- At high temperature okra exhibit high rates of respiration resulting in rapid production of heat and subsequent deterioration.
- The okra can be stored for 7-10 days at 7-10°C temperature and 90-95% relative humidity.



(a)



(b)



(c)

Fig.7. Packaging of okra in (a) CFB Cartons (b) Polyethene bag (c) polynet bag

Processing

- The okra fruits blanched at 60 °C + dipping in 0.1% KMS solution + Cabinet Drying could be stored significantly for a period of 60 days at ambient conditions without much loss of nutritional qualities of the product.



Fig.7. Dehydrated okra slices

Precooling

- Unless okra is rapidly cooled soon after harvesting, the heat build-up will accelerate spoilage and cause pod blackening.
- Precooling to 10°C before packing extends the storage life to 12 days.
- Forced air cooling with high humid air is essential for quick cooling without causing desiccation.
- Hydro cooling should not be used as it causes water spotting.

Packaging

- Okra pods can be loosely packed into one or two-piece self-locking fiber board cartons. However, the pods packed without film liners shrivel very fast and become unmarketable within 2 days.

PHPTC Activities

Visit of S. Gurmeet Singh Khuddian Hon'ble Minister of Agriculture and Farmers' Welfare, Punjab and Sh. K.A.P. Sinha, Chief Secretary Punjab alongwith other dignitaries of Punjab :

S. Gurmeet Singh Khuddian Hon'ble Minister of Agriculture and Farmers' Welfare, Punjab; Sh. K.A.P. Sinha, IAS, Chief Secretary Punjab, Sh. Manish Sisodia, Former Deputy Chief Minister, Delhi; Sh. Mohammad Tayaab, IAS Administrative Secretary Horticulture, Punjab; Dr. Satbir Singh Gosal, PAU Vice-Chancellor and other officers of the Government of Punjab as well as the officers of the P.A.U. visited Punjab Horticultural Postharvest Technology Centre on 18th May, 2025. Dr. B.V.C. Mahajan, Director PHPTC conducted the visit of the dignitaries and explained the various research and development activities going on in the Centre. All dignitaries took a round of different laboratories and interacted with the scientists regarding postharvest management of horticultural produce, testing of food commodities in NABL accredited quality control laboratory.



Training programme on pear processing: A training program on postharvest handling and value addition of pear fruits was organized by Punjab Horticultural Postharvest Technology Centre, P.A.U. Ludhiana on 22-08-2025 in

collaboration with Reviving Green Revolution Cell (an associated organization of TATA Trust) under PRANA programme. A total of 20 women from the districts of Amritsar and Tarn Taran attended the programme. The participants were given hands-on-training for preparation of pear jam, pear bar, pear candy and pear nectar. They were also made aware about importance of quality testing of processed products for their better marketing.



Visit of Japan International Cooperation Agency (JICA) delegation to PHPTC:

A team of Japan International Cooperation Agency (JICA) delegates visited Punjab Horticultural Postharvest Technology Centre on 26-8-2025. They were shown the ongoing research, laboratory testing and training activities. The JICA members were highly impressed to see the postharvest laboratory and Quality Control Laboratory infrastructure established at PHPTC.





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Testing of Drinking Water

Sr. No.	DRINKING WATER TESTING (PACKAGE DETAILS)	TESTING CHARGES PER SAMPLE (RS.)
		Govt. Institutions / Farmers / Students
<u>PACKAGE I</u>		
1.	Microbiological analysis (Total Coliforms, Faecal Coliforms, E.coli)	500.00
2.	Total Hardness	250.00
3.	Total Residual Chlorine (mg/L)	250.00
4.	TDS, pH, Color, Odour	250.00
	Total	1250.00
<u>PACKAGE II</u>		
1.	Microbiological analysis (Total Coliforms, Faecal Coliforms, E.coli)	500.00
2.	Total Hardness	250.00
3.	Total Residual Chlorine (mg/L)	250.00
4.	TDS, pH, Color, Odour	250.00
5.	Heavy metal analysis (5 in No.)	2000.00
	Total	3250.00
<u>Package III</u>		
1.	Drinking Water Analysis as per IS : 10500 (Aluminum, Barium, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Selenium, Silver, Zinc, Cadmium, Lead, Mercury, Nickel, Cobalt, Chromium, Arsenic, Molybdeum, TDS, pH, color, odour, Temporary / Permanent Hardness, Chlorine as Chloride, Free Residual Chlorine, Flouride, Alkalinity, Sulfate, TDS, Faecal Coliform as MPN, E. coli, Total Coliforms)	10000.00
<u>Package IV</u>		
1.	Proximate analysis of food samples (Energy, total protein, crude fat, crude fibre, total ash, and carbohydrates)	3000.00

Instructions for collecting water sample

1. For microbiological analysis : 100-250 ml water sample in clean Glass Bottle (washed with hot water) to be fully filled and capped.
2. For other parameter analysis : 2.5 litre sample in a Plastic Bottle.

PAYMENT RELATED INFORMATION : Testing charges are payable in advance through Digital Mode/E-payment / Cash through RTGS/ NEFT with bank details as below :-

Account Name : Director, Punjab Horticultural Postharvest Technology Centre,
Punjab Agricultural University, Ludhiana
Bank : State Bank of India, PAU Branch Ludhiana
Account No. : 10088206121
IFSC Code : SBIN0001482
GST No. : 03AAAJPO627N2Z5

18% GST (extra) will be charged for all the above mentioned test charges. **PHPTC is exempted from Income Tax u/s 10(23C(iiiab) of Income Tax Act 1961.**