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On behalf of:
Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
the Federal Republic of Germany

CCL Cold Chain Logistics Resource Centre

CII Confederation of Indian Industry

Post-Harvest Management Protocols

CHILLIES

Green Chilli is the most common spice cultivated in India that is grown nearly in all parts of the country, including hills and plains. The important chilli growing states are Andhra Pradesh, Orissa, Maharashtra, West Bengal, Karnataka, Rajasthan and Tamil Nadu.

MATURITY INDICES

Green Chillies are mature when they turn their final colour. They are green when immature and can be harvested at that time. The best temperature for ripening is 22-25°C and direct sunlight is to be avoided since this can result in development of white patches. The ripened pods should be dried in the sun spreading them on clean dry polythene sheets, cemented drying yard. Moisture content of dry pods should be kept at 8-10%. Green Chillies should be stacked at 50 to 60 cm way from the wall. During Harvest, care should be taken to hold stalks firmly and fruit should be pulled upward gently by breaking the base of the stalks.

POST-HARVEST HANDLING

The harvested fruits should be heaped indoor for 2-3 days, so that the partially ripe fruits, allows the whole produce to develop a uniform red colour. Periodic fumigations during storage with methyl bromide and phosphine is useful to control insects. The product should not be stored for longer period except in case of cold storage with moisture proof plastic liners (polythene bags) preferably between 0-10°C with 65 to 70 percent humidity. If possible while transporting from field, plastic field crates in places of sacks may be used to avoid mechanical damage.

POTENTIAL POST-HARVEST LOSSES

Mechanical Damage

Green Chillies are susceptible to mechanical damage particularly if transported in sacks or bags. Mechanically damaged Green Chillies, shown by cracks, splits and punctures, will deteriorate rapidly.

Physical Factors

Contact with moisture which remains on the Green Chillies when packed will cause rapid deterioration. Harvesting during rain is to be avoided.

Pathological Factors

Infection from micro-organisms generally occurs as secondary infection after the fruit has commenced deterioration and collapsed because of over-ripening and softening.

GRADING

Grading is a pre-requisite for development of the modern marketing, trade and economy of any commodity. The Indian Green Chillies are graded mostly by farmers based on colour and size before they are brought in the market. The damaged discoloured and immature pods are removed depending on market demand. However, at traders' level the other important quality parameter are moisture and stalks. Excess moisture add weight to the pods but give room to various fungi to grow.

Similarly, if the stalk of the pods is broken, exposing the seeds entirely, the seeds may fall out. On the other hand, in absence of optimum moisture the pods may break and let off the seeds. Thus, the seed and pod ratio in a lot is also a valuable parameter of grade. Fresh, green coloured Green Chillies graded with 70 -100 mm diameter is of good quality in the market.

End users are mainly of two types. These include domestic retail users and industrial wholesale users. Industrial users who prepare Chilli powder gives preference for colour-pungency, fleshly skin and less seeds. Whereas the domestic users prefer all varieties for different occasions. There are several local and conventional grades followed by the farmers, village merchants and itinerant merchants. The visual assessment of grades by seeing the lots/heaps and by picking hand full of pods and analysing them to enable the traders to adequate and assess the prices both in open and closed auction.

PACKAGING

Packaging is an important function for every produce and so is in marketing of Chilli. It is a practice to protect the produce from any damage during storage, transportation, and other marketing aspects. It is required at every stage of marketing from the producer to the consumer. In recent years, packaging plays an important role in marketing of produce. Good packaging of chilli not only facilitates convenience in transportation and storage but also attracts consumer to pay more.

The packaging reduces the marketing cost and protects the quality. Green Chillies are packed in the same 40 x 30cm wooden trays as tomatoes, with a cardboard cover. They can also be packed in either half- or full-telescopic fiber-board cartons with butter paper at the top and the bottom. If full boxes are used, a central divider should be inserted. The net weight of Green Chillies varies. Open or ventilated boxes are preferred to closed ones because the latter cause gas to build up, temperature to rise, and condensation to form, which hastens deterioration.

STORAGE

Storage is a very important component of marketing which has a direct impact on the prices. Adequate storage facilities will help in effectively always distributing and marketing and in all places. Storage function thus is responsible for balancing supply and demand situation. In India, different states follow different methods of storage.

In some states the Green Chillies are stored in markets with the commission agents in their shops for 5 to 30 days. The farmer also stored chilli in the houses for about 5 to 15 days.

The Green Chillies are mostly stored in gunny bags by the producers, wholesaler, and exporters for a period of 1 to 6 months depending upon the market conditions. The farm level storage capacity among the Chilli growers is not adequate in the country. Well maintained storage units in the market yards with low and uniform storage charges would encourage more farmers to store Green Chillies in the marketplaces and improve their bargaining capacity. Storage structures can range from Containers to Open spaces, Shelves and Underground storage chambers. Community based storage facilities owned by farmers/ cooperatives is also established.

Storage Parameters

Recommended Temperature (in degree Celcius)

6 to 7

Recommended Relative Humidity (in %)

90 to 95

Shelf Life

2-3 Weeks

Extended Storage Temperature (in degree Celcius)

3 to 8

Chilling Injury	At Storage below 7°C
Accelerated Ripening and Bacterial Soft Rot stress	At Storage above 2°C
Others	High Sensitivity to Ethylene gas