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## Early potatoes — Guide to cooling and refrigerated transport

*Pommes de terre de primeur — Guide pour la réfrigération et le transport réfrigéré*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9376 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

Annex A is for information only.

# Early potatoes — Guide to cooling and refrigerated transport

## 1 Scope

This International Standard lays down general guidelines for the cooling and refrigerated transport of early potatoes of the species *Solanum tuberosum* Linnaeus, intended for direct consumption or food manufacture.

It applies to potatoes harvested before complete maturation, to be marketed immediately, and the skin of which can be easily removed by rubbing.

## 2 Cooling

**2.1** Early potatoes intended for long-distance transport after harvesting or to be kept for longer than 2 or 3 days before sale shall be cooled in order to maintain their quality and appearance.

**2.2** Potatoes intended for cooling or refrigerated transport shall be protected during harvesting, avoiding exposure in the open to the damaging effects of sun, wind and rain.

**2.3** After harvesting, the potatoes shall be transported directly to the sorting, packaging, cooling and dispatch stations in transport vehicles equipped with canvas covers. Potatoes sorted and packed at the point of harvesting shall be transported immediately in refrigerated vehicles to the cooling and dispatch stations.

NOTE — Freshly harvested produce under tropical (or sub-tropical) climates should be kept stacked in the field in shade at 20 °C and 70 % humidity for 3 to 5 days in order to allow the skin of tubers to become more resistant to mechanical damage.

**2.4** Cooling is suitable only for adequately packed potatoes compatible with the maintenance of the minimum quality conditions and sizes laid down in the relevant commercial standards.

**2.5** Potatoes intended for cooling and refrigerated transport shall be packed in mesh-bags, jute sacks or cardboard boxes, with a package unit mass of up to 50 kg, or in plastic bags containing up to 2 kg, perforated to permit aeration during the short-term storage.

**2.6** The minimum cooling temperature shall be between 10 °C and 14 °C. This temperature allows healing of epiderm damaged during conditioning operations (washing, selection, sizing and packing), and inhibits browning, and physiological and pathological deterioration.

NOTE — Transport of produce in tropical countries should be preceded by a curing period as indicated in the note in 2.3.

## 3 Refrigerated transport

**3.1** The optimum temperature of transport is between 10 °C and 12 °C. The relative humidity shall be 85 % to 95 %. It is recommended not to reduce the temperature below 10 °C, or to raise the relative humidity above 95 %.

**3.2** The bags, boxes or other packages shall be arranged in the transport vehicles so as to allow aeration of the total load and maintenance of the optimum temperature level and relative humidity during transport.

**3.3** During transport, it is necessary to monitor the temperature and relative humidity continuously in order to avoid deviations from the established values.