
International Standard



7920

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Sweet cherries and sour cherries — Guide to cold storage and refrigerated transport

Cerises et griottes — Guide pour l'entreposage et le transport réfrigéré

First edition — 1984-11-01

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UDC 634.23 : 664.8.037

Ref. No. ISO 7920-1984 (E)

Descriptors: fruits, cherries, cold storage, transportation.

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. Every 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.

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 7920 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

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Sweet cherries and sour cherries — Guide to cold storage and refrigerated transport

1 Scope and field of application

This International Standard describes the optimum conditions for the cold storage and refrigerated transport of sweet cherries (*Prunus avium* L.) and sour cherries (*Prunus cerasus* L.) intended either for direct consumption or for industrial processing.

2 References

ISO 2169, *Fruits and vegetables — Physical conditions in cold stores — Definitions and measurement.*

ISO 6661, *Fresh fruits and vegetables — Arrangement of parallelepipedic packages in land transport vehicles.*

3 Conditions of harvesting and putting into store

3.1 Varieties

3.1.1 Sweet cherries

Varieties of sweet cherries having a dark colour and a crisp hard flesh are most suitable for cold storage and refrigerated transport. Varieties which ripen early and having soft flesh soon lose their commercial quality because they rapidly deteriorate and white varieties rapidly become discoloured. These types should, therefore, be used within a very short time of harvesting.

3.1.2 Sour cherries

Varieties ripening late and having a hard flesh are suitable for storage and transport over short periods. Varieties ripening early and having soft flesh are unsuitable for storage and should be processed quickly after harvesting.

3.2 Harvesting

Harvesting should not be carried out just after a period of rain.

The fruits should be harvested when they have attained the characteristic stage of development (maturity) for the variety. This can be determined by the colour, taste of the fruit and by measuring the soluble solids content.

Sweet cherries and sour cherries for direct consumption should be picked carefully, with their stems, by hand. However, in certain cases (nature of the variety, previous chemical treatment for example Ethrel), the stem dries out before harvest and it is possible to gather the fruit without its stem for industrial processing (subject to agreement between the interested parties). Such fruits are only suitable for storage or long distance transport if they do not exude juice from the point at which the stem was attached. Fruits may be packed directly when harvested to avoid loss of moisture after picking and to protect the fruits from wind, heat and sunshine during transport to the store.

3.3 Qualitative requirements for storage and transport

Fruits intended for cold storage and refrigerated transport should be whole, sound, clean, at the appropriate stage of development (maturity) for the variety, and free from mechanical injuries and injuries caused by insects. The colour of the fresh fruit should be bright, the skin should be smooth and tight, the fruit should be full and the stem should be a fresh green colour.

Fruits removed from the tree by shaking are unsuitable for storage and for long distance transport but should be cooled immediately to a minimum of 5 °C by immersion in chilled (iced) water and processed within a few hours of harvesting.

The appropriate standards of the trade and processing industry should be taken into consideration.

3.4 Packaging

The packages should protect the fruits against being crushed and bruised. Wooden boxes, in which 6 to 10 kg can be placed, either loose or in layers up to a maximum height of 10 cm, are most often used. To conserve the quality of the fruits, plastics boxes can also be used.

If fibreboard or wooden boxes are used, the use of a paper liner is appropriate. Care shall be taken, however, to ensure that the paper is not hygroscopic, as, otherwise, staining may occur on the surface of the fruits.

Boxes may be lined with polyethylene sheets which permit the accumulation of carbon dioxide, which is favourable to the maintenance of the quality.

Extreme care should be taken to minimize impact, compression, and vibrational damage during harvesting, grading or transport, to reduce fruit losses resulting from bruises, surface pitting and increased weight loss.

3.5 Putting into store

The fruits should be placed in cold storage as soon as possible after packing, in order to minimize losses in mass.

4 Optimum storage conditions

(see ISO 2169)

4.1 Temperature

The optimum temperatures are

- a) for sweet cherries: +1 to +2 °C;
- b) for sour cherries: -1 to +2 °C.

NOTE — Although the “freezing point” of sweet cherries is about -2 °C, they lose their characteristic taste more rapidly at temperatures below +1 °C.

4.2 Relative humidity

The relative humidity of the air should be 90 to 95 % for both sweet cherries and sour cherries.

4.3 Composition of the air

Sweet cherries can be kept equally well in atmospheres having high carbon dioxide contents (5 to 6 %) and those having low oxygen contents (2 to 3 %).

4.4 Storage life

4.4.1 Sweet cherries

The storage life of sweet cherries depends on the variety, but, at a temperature of 1 to 2 °C, a storage life of 2 to 3 weeks can be expected. If the temperature lies between 2 and 5 °C, the storage life will be reduced to a few days only.

4.4.2 Sour cherries

Sour cherries can be stored for not more than 5 days when the temperature is between 1 and 2 °C. They will not keep if the temperature exceeds 2 °C.

5 Refrigerated transport

5.1 Optimum conditions for transport

Taking into account their nature, the fruits should not be transported for more than 3 days.

The packages should be arranged within the transport vehicle in accordance with ISO 6661.

5.2 Means of transport

The fruits should be refrigerated continuously during transport. For this purpose, ice- or mechanically refrigerated railway trucks or refrigerated lorries may be used.

The vehicles and equipment used for transport should not have been previously used for the carriage of materials harmful to health (chemical substances, plant protection materials, fertilizers). The vehicles and equipment should be in good working order, i.e. fans should be operating, drains should be free within ice-refrigerated railway trucks and floor racks ensuring air circulation should be in position. Before loading, the loading space of the vehicles should be pre-cooled, either by icing the bunkers or by mechanical refrigeration.

5.3 Transportation, handling on arrival

If, as a consequence of warm weather or long transit periods, the ice melts during transport in ice-refrigerated railway trucks, re-icing should be carried out at an interim station to ensure that, at the destination, the trucks arrive with their bunkers not less than one-third full.

After unloading the fruit from the transport vehicle, continuous cooling should be applied until the fruits are used.