SLOVENSKI STANDARD
SIST ISO 7560:1996

01-december-1996

Kumare - Skladiščenje in hlajen transport

Cucumbers -- Storage and refrigerated transport

Concombres -- Entreposage et transport réfrigérés

Ta slovenski standard je istoveten z: **ISO 7560:1995**

ICS:

67.080.20	Zelenjava in zelenjavni proizvodi	Vegetables and derived products

SIST ISO 7560:1996 **en**

INTERNATIONAL STANDARD

ISO 7560

Second edition
1995-10-01

Cucumbers — Storage and refrigerated transport

Concombres — Entreposage et transport réfrigérés

Reference number
ISO 7560:1995(E)

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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7560 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 14, *Fresh fruits and vegetables*.

This second edition cancels and replaces the first edition (ISO 7560:1983), which has been technically revised.

Annex A of this International Standard is for information only.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

Cucumbers — Storage and refrigerated transport

1 Scope

This International Standard gives guidance on conditions for the successful storage and long-distance transport of cucumbers (*Cucumis sativus* L.), intended either for direct consumption or for industrial processing.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2169:1981, *Fruits and vegetables — Physical conditions in cold stores — Definitions and measurement.*

3 Conditions for harvesting and storage

3.1 Harvesting

Cucumbers should be cut from the plant and handled carefully. Mechanical damage should be avoided, especially around the stalk of the fruits.

3.2 Characteristics for storage

Cucumbers intended either for consumption in the fresh state or for industrial processing should be harvested at a development stage corresponding to the quality requirements specified in the relevant product standard.

They should be characteristic of the variety and suitable for the intended use.

Cucumbers should

— be intact and sound;

— be free from any visible foreign matter;

— be of fresh appearance;

— be firm and free of abnormal external moisture;

— be free of any foreign odour or taste;

— have seeds which are soft and undeveloped.

Cucumbers should not be withered, senescent, yellowish or yellow ripened.

NOTE 1 Quality requirements for cucumbers produced under conditions of forced growth for transport for direct consumption are given in UN-ECE Standard No. 23.

3.3 Classification

Cucumbers are classified into three classes as follows (see UN-ECE Standard No. 23).

a) **"Extra" class**

Cucumbers in this class should be of superior quality. They should have all the characteristics of the variety. They should

— be well developed;

— be well shaped and practically straight (maximum height of the arc 10 mm per 10 cm of length of the cucumber);

— have a typical colouring for the variety; and

— be free of defects, including all deformations and particularly those caused by seed formation.

b) **Class I**

Cucumbers in this class should be of good quality. They should

— be reasonably developed;

— be reasonably well shaped and practically straight (maximum height of the arc 10 mm per 10 cm of length of the cucumber).

The following defects are allowed:

— a slight deformation, but excluding that caused by seed formation;

— a slight defect in colouring, especially the light coloured part of the cucumber where it touched the ground during growth;

— slight skin blemishes due to rubbing and handling or low temperature, provided that such blemishes have healed and do not affect the keeping quality.

c) **Class II**

This class comprises cucumbers which do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified above. However, they may have the following defects:

— deformation other than serious seed development;

— defects in colouring up to one-third of the surface (in the case of cucumbers grown in glasshouses, considerable defects in colouring in the affected part are not allowed);

— healed cracks;

— slight damage caused by rubbing and handling which does not seriously affect the keeping quality and appearance;

— straight and slightly crooked cucumbers may have deformations other than serious seed development;

— crooked cucumbers are allowed if they have only slight defects in colouring and have no other deformations;

— slightly crooked cucumbers may have a maximum height of the arc of 20 mm per 10 cm of length;

— crooked cucumbers may have a greater arc and, if packed, shall be labelled "crooked cucumbers".

3.4 Sizing

Size is determined by the mass of the cucumbers. The minimum mass for all outdoor cucumbers is 180 g, and for all forced glasshouse cucumbers it is 250 g. Sizing is compulsory for Extra Class and Class I. The difference in mass between the heaviest and lightest fruit in the same package should not exceed 50 g.

3.5 Packing

The methods of packing should be such as to maintain the quality of the cucumbers during storage, transportation and handling.

Medium-long salad cucumbers intended for consumption in the fresh state, and pickling cucumbers for industrial processing, may be packed in wooden crates or perforated fibreboard boxes.

Very small pickling cucumbers (from 3 cm to 6 cm long) and salad cucumbers grown under conditions of forced growth should be packed in wooden crates or perforated fibreboard boxes; the salad cucumbers should be packed in layers in the wooden crate or perforated fibreboard box, which should not contain more than 10 kg to 15 kg. Wrapping individually in film or cellophane or waxing the cucumbers is recommended.

4 Optimum storage and transport conditions

For measurement of the physical quantities affecting storage, see ISO 2169.

4.1 Temperature

The optimum temperature for the storage and transport of cucumbers is between + 7 °C and + 10 °C. Because of the susceptibility of cucumbers to chilling, the temperature should only temporarily be allowed to fall bellow + 7 °C. Above + 10 °C, cucumbers turn yellow within 10 days, and at + 15 °C even sooner, depending on the stage of development of the cucumbers. Once yellowing has begun, the product is no longer suitable for storage and transport.

Cucumbers should be packed as soon as possible after harvesting, and put into the cold store so that they are cooled to + 7 °C to + 10 °C until loading.

4.2 Relative humidity

The optimum relative humidity is between 90 % and 95 %. Air with a lower relative humidity would favour wilting and loss in mass of the cucumbers. In the case of cucumbers for direct consumption, wrapping individually in film or cellophane, or waxing, serves to maintain this relative humidity.

4.3 Other conditions

During storage and transport, circulation of air should be assured so that constant temperature and relative humidity are maintained.

Yellowing of the cucumbers will be hastened by ethylene; products producing ethylene (such as apples, pears, peaches, bananas, tomatoes, melons and citrus fruits) should not be present in the same store or transport vehicle.

4.4 Duration of storage and transport

Cucumbers are highly perishable and they should therefore be stored and transported for the shortest time possible. The quality can be maintained for about 10 days at the optimum temperature of + 7 °C to + 10 °C and at 90 % to 95 % relative humidity.

If each fruit is packed separately in polyethylene film, cucumbers produced under conditions of forced growth can be stored at + 12 °C to + 13 °C for 2 weeks. Cucumbers stored or transported at temperatures below + 7 °C should be used within 2 to 4 days, or immediately after storage, or on arrival as, at higher temperatures, fruits previously kept at low temperatures soon show signs of damage caused by chilling (shallow surface pits followed by decay, caused by microorganisms).

4.5 Putting into storage

Cucumbers packed in wooden crates or fibreboard boxes may be placed in a precooled cold store in stacks, according to the load-bearing capacity of the containers.

5 Transportation

5.1 Means of transport

Refrigeration of the cucumbers should be maintained during transport. For this purpose, ice-refrigerated or mechanically refrigerated railway trucks or refrigerated lorries may be used.

5.2 Requirements for the transport vehicle and loading

For the transportation of cucumbers, the vehicle used shall not have previously carried materials harmful to health (for example, fertilizers, plant protection materials or other chemical substances). It should be in good technical condition, for example, fans should be in working condition, drains should be free in ice-refrigerated railway trucks, and floor racks assuring the circulation of air in railway trucks or lorries should be in position.

Before loading, the temperature of the loading space in the vehicles should be cooled to that required, either by icing the bunkers or by mechanical refrigeration.

Wooden or fibreboard boxes containing cucumbers should be stacked lengthwise (facing forward), and only boxes necessary for filling spaces between the stacks to prevent them from moving during transport should be put crosswise. Similarly, any remaining gaps should be filled with empty boxes or crates for the same purpose. (For further information, see ISO 6661.)

The ice bunker if ice-refrigerated railway trucks should be re-iced to capacity after loading.

If, as a consequence of warm weather or a long transit period, the ice melts in ice-refrigerated railway trucks during transport, 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.

6 Operations on arrival

After unloading, cucumbers should be continuously cooled or used immediately, depending on the storage and transport conditions. Cucumbers stored or transported at temperatures between + 12 °C and + 14 °C may be stored up to the recommended duration of storage.