
INTERNATIONAL STANDARD



2167

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

Headed cabbages — Guide to storage

Choux-pommés — Guide pour l'entreposage

First edition — 1974-08-15

STANDARDSISO.COM : Click to view the full PDF of ISO 2167:1974

UDC 664.83

Ref. No. ISO 2167-1974 (E)

Descriptors : agricultural products, vegetables, cabbages, food storage.

Price based on 3 pages

FOREWORD

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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.

International Standard ISO 2167 was drawn up by Technical Committee ISO/TC 34, *Agricultural food products*, and circulated to the Member Bodies in November 1970.

It has been approved by the Member Bodies of the following countries :

Australia	Hungary	Romania
Austria	India	South Africa, Rep. of
Belgium	Iran	Sweden
Chile	Israel	Thailand
Czechoslovakia	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
France	Poland	
Germany	Portugal	

No Member Body expressed disapproval of the document.

Headed cabbages — Guide to storage

1 SCOPE AND FIELD OF APPLICATION

This International Standard describes methods for obtaining conditions for the successful keeping, with or without artificial cooling, of headed cabbages of the varieties derived from *Brassica oleracea* Linnaeus, var. *capitata* Linnaeus¹⁾, and from *Brassica oleracea* Linnaeus, var. *sabauda* Linnaeus.

It applies only to varieties which ripen late and are suitable for prolonged storage.

See also the limits of application given in the annex.

2 REFERENCE

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

3 CONDITIONS OF HARVESTING AND PUTTING INTO STORE

3.1 Varieties

For storage purposes, only the late varieties having firm heads with tightly attached leaves are recommended.

3.2 Harvesting

For storage purposes, it is advisable to select cabbages which have been harvested when ripe and in dry weather (firm "head"). Premature lifting may cause an excessive tendency to withering and, conversely, belated lifting induces bursting of the cabbages.

The cabbages should be free from disease and physiological defects. Cabbages with damaged or frozen stalks should be rejected. The stump of the head should be cut off slightly below the point from which the leaves originate, the latter remaining firmly attached; the cut should be clean in order to prevent the cabbages from being damaged by mechanical action during handling.

If the cabbages are harvested in wet weather, they should be allowed to dry for the necessary period before being stored.

3.3 Quality characteristics for storage

The cabbages intended for storage should be fresh in appearance, whole, not run to seed, clean (in particular free from earth) and free from any trace of liquid water.

3.4 Putting into store

In order to avoid separation of the leaves from the stump during storage, the cabbages should not be put into storage with fruits which produce ethylene.

3.5 Method of storage

The cabbages may be stored loose or in crates.

If the cabbages are stored loose, the system of ventilation must secure a satisfactory air circulation through the layers of the product.

In order to facilitate circulation of air between the crates, it is recommended that the latter should not be closely stacked.

The cabbages should be arranged in rows with the stumps facing upwards.

4 OPTIMUM STORAGE CONDITIONS²⁾

4.1 Temperature

A temperature of 0 to + 2 °C is generally recommended as being optimum, but white cabbage will tolerate a temperature of – 0,8 °C.

Lowering the temperature below – 0,8 °C may cause the tissues of the leaves to decompose.

4.2 Relative humidity

The relative humidity should be kept at between 90 and 95 %.

1) The Latin name of this variety is under examination.

2) For definitions and measurement of the physical quantities affecting storage, see ISO 2169.

4.3 Air circulation

4.3.1 *Mixing*

The mixing of air in a closed circuit makes it possible to render the temperature and relative humidity uniform. An air-circulation ratio of between 20 and 30 is recommended.

4.3.2 *Air change*

Changing of the atmosphere is desirable in order to remove heat and to prevent an excess of carbon dioxide due to respiration.

4.3.2.1 When natural cooling is used, and during periods when it is no longer possible to effect ventilation by the admission of outside air, it is necessary to renew frequently the atmosphere in the store. A mixture of outside air and store air can be used if the temperature of this mixture is above 0 °C.

4.3.2.2 When artificial cooling is used, with mixing in a closed circuit, renewal of the atmosphere should be carried out at regular intervals throughout the storage period.

4.3.2.3 In both cases a flow of 100 m³ per cubic metre of product per hour is recommended.

4.4 Storage life

The expected storage life for late varieties, under the conditions indicated above, is from 3 to 6 months according to the region, variety and conditions in the store.

4.5 Operations at the end of storage

The cabbages should be inspected and stripped of the outermost leaves, which may have deteriorated or withered; the stump should also be cut again. They may then be kept for 2 to 3 weeks at temperatures up to + 10 °C.

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