International Standard 4187

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Horse-radish — Guide to storage

Raifort — Guide pour l'entreposage

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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 4187 was developed by Technical Committee ISO/TC 34, *Agricultural food products*, and was circulated to the member bodies in April 1978.

It has been approved by the member bodies of the following countries :

Australia	Iran	Romania
Austria	Israel	South Africa, Rep. of
Bulgaria	Korea, Rep. of	Spain
Canada	Mexico	Turkey
Czechoslovakia	Netherlands	USA
France	New Zealand	Yugoslavia
Hungary	Poland	

No member body expressed disapproval of the document.

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Horse-radish — Guide to storage

1 Scope and field of application

This International Standard describes methods for obtaining conditions for the successful keeping of roots of the species *Armoracia rusticana* Gaertner, B. Meyer and Scherbius, intended, after storage, for direct consumption or for industrial processing.

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 Harvesting

The horse-radish roots should be lifted during the winter dormancy; lifting should start in late autumn as the roots are very hardy, but should be finished before frosts begin, in countries and locations prone to heavy frosts.

3.2 Quality characteristics for storage

All horse-radish cultivars grown in any region are suitable for long-term storage; no distinction among them is therefore necessary in respect of storage.

The product should correspond to the standards which are valid in the producing country, and should be of high quality.

The roots should appear fresh and should be clean, sound, whole, not stringy, and free from secondary roots, bruises, deep fissures, and visible damage caused by insects or diseases.

3.3 Putting into store

The roots should be cleaned, sorted by quality classes immediately after lifting, and put into cold store within one or two days so that their fresh and pungent state can be maintained. The cold rooms should be pre-cooled to 0 °C to obtain rapid cooling of the roots.

3.4 Methods of storage

The roots may be stored in containers, boxes or pallet boxes; these may be lined with polyethylene film to prevent moisture loss.

In practice, for example about 25 kg of horse-radish can be put in a box of dimensions 40 cm × 60 cm × 33 cm.

The thickness of polyethylene film liners commonly used is 0,1 to 0,2 mm. The polyethylene film lining should fit the box; the part of the film remaining free should be folded over the roots in such a way as to ensure some circulation of air. Unlined boxes can be covered with polyethylene film of appropriate dimensions.

The containers shall be free from contamination and foreign odour. No product other than horse-radish shall be stored, even temporarily, in the room intended for storage of horse-radish. The room should be clean and free from pests and diseases. The store should be filled continuously and quickly; if it is only partly filled, a suitable partition should be used to separate the filled and unfilled areas.

4 Optimum storage conditions[1)]

4.1 Temperature

The optimum temperature is between 0 and −2 °C; the temperature should not rise above 0 °C.

4.2 Relative humidity

The optimum relative humidity is between 90 and 95 %.

4.3 Air circulation

The containers and the way in which they are stacked should permit free circulation of air, in order to maintain a uniform temperature.

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