
UNECE STANDARD FFV-24

concerning the marketing and
commercial quality control of

CULTIVATED MUSHROOMS

2023 EDITION



UNITED NATIONS
New York and Geneva, 2023

NOTE

Working Party on Agricultural Quality Standards

The commercial quality standards developed by the Working Party on Agricultural Quality Standards of the United Nations Economic Commission for Europe (UNECE) help facilitate international trade, encourage high-quality production, improve profitability and protect consumer interests. UNECE standards are used by Governments, producers, traders, importers and exporters, and other international organizations. They cover a wide range of agricultural products, including fresh fruit and vegetables, dry and dried produce, seed potatoes, meat, cut flowers, eggs and egg products.

Any member of the United Nations can participate, on an equal footing, in the activities of the Working Party. For more information on agricultural standards, please visit our website <http://www.unece.org/trade/agr/welcome.html>.

The present revised Standard for Cultivated Mushrooms is based on documents ECE/TRADE/C/WP.7/GE.1/2010/10 and ECE/TRADE/C/WP.7/2012/8, reviewed and adopted by the Working Party at its sixty-sixth and sixty-eighth sessions.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations Secretariat concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Mention of company names or commercial products does not imply endorsement by the United Nations.

All material may be freely quoted or reprinted, but acknowledgement is requested.

Please contact us at the following address with any comments or enquiries:

Agricultural Standards Unit
Economic Cooperation and Trade Division
United Nations Economic Commission for Europe
Palais des Nations
CH-1211 Geneva 10, Switzerland
Email: agrstandards@un.org

UNECE standard FFV-24 concerning the marketing and commercial quality control of cultivated mushrooms

I. Definition of produce

This standard applies to the carpophores (fruiting bodies) of strains grown from the genus *Agaricus* (syn. *Psalliota*)¹ to be supplied fresh to the consumer, mushrooms for industrial processing being excluded.

Cultivated mushrooms are classified into the following commercial types, whereas these first of all are classified into two groups:

- uncut mushrooms, which have the lower part of the stalk uncut
- cut mushrooms, which have the lower part of the stalk cut.

In both groups, a distinction is made between the stages of development:

- closed mushrooms, i.e. mushrooms with the cap completely closed
- veiled mushrooms, i.e. mushrooms whose cap is connected to the stalk by the veil
- open mushrooms, i.e. mushrooms with an open cap (open cap or flat; a slight downturn of the edges of the cap is required)
- flat mushrooms, i.e. mushrooms that are fully open (but the edges of the cap are neither too cupped nor inverted).

Cultivated mushrooms are further classified into two colour groups:

- “white”
- “brown” or “chestnut”.

II. Provisions concerning quality

The purpose of the standard is to define the quality requirements for cultivated mushrooms after preparation and packaging.

However, if applied at stages following export/dispatch, products may show in relation to the requirements of the standard:

- a slight lack of freshness and turgidity
- for products graded in classes other than the “Extra” Class, a slight deterioration due to their development and their tendency to perish.

The holder/seller of products may not display such products or offer them for sale, or deliver or market them in any manner other than in conformity with this standard. The holder/seller shall be responsible for observing such conformity.

A. Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the cultivated mushrooms must be:

- intact; in case of cut mushrooms the cut must be clean

¹ However, for mixed packages as defined in Chapter V, A. (Uniformity), the cultivated mushrooms of species other than *Agaricus* must meet the minimum requirements.

- sound; produce affected by rotting, severe browning in the stalk or deterioration such as to make it unfit for consumption is excluded
- clean, practically free of any visible foreign matter, other than casing material
- fresh in appearance, account should be taken of the typical gill colour of the strain and/or commercial type
- practically free from pests
- practically free from damage caused by pests
- free of abnormal external moisture
- free of any foreign smell and/or taste.

The development and condition of the cultivated mushrooms must be such as to enable them:

- to withstand transportation and handling
- to arrive in satisfactory condition at the place of destination.

B. Classification

The cultivated mushrooms are classified in three classes, as defined below:

(i) “Extra” Class

Cultivated mushrooms in this class must be of superior quality. They must be characteristic of the commercial type. They must be well formed.

The cultivated mushrooms must be practically free of casing material; uncut mushrooms may also have traces of casing material on the foot.

In the case of cut mushrooms, the cut must be approximately perpendicular to the longitudinal axis.

They must be free from defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

(ii) Class I

Cultivated mushrooms in this class must be of good quality. They must be characteristic of the commercial type.

In the case of cut mushrooms, the cut must be approximately perpendicular to the longitudinal axis.

The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- a slight defect in shape
- slight defects in colouring
- slight superficial bruising
- very slight internal moisture of the stalk
- slight traces of casing material; uncut mushrooms may also have some casing material on the foot.

(iii) Class II

This class includes cultivated mushrooms that do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified above.

The following defects may be allowed, provided the cultivated mushrooms retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects in shape
- defects in colouring
- slight bruising
- slight damage to the stalk
- slight internal moisture of the stalk
- discoloured feathering
- hollow stalks
- traces of casing material; uncut mushrooms may also have some casing material on the foot.

III. Provisions concerning sizing

Size is determined by the maximum diameter of the cap and the length of the stalk, according to the following specifications. The length of the stalk is measured from:

- the gills under the cap for open and flat mushrooms
- the veil for closed and veiled mushrooms.

The minimum size shall be:

- 15 mm for closed cap, veiled and open mushrooms
- 20 mm for flat mushrooms.

To ensure uniformity in size, the range in size between produce in the same package shall not exceed:

(a) Closed, veiled and open mushrooms

<i>Size</i>	<i>Diameter of cap</i>		<i>Maximum length of stalk</i>	
	<i>Size limits</i>		<i>Cut mushrooms</i>	<i>Uncut mushrooms</i>
Small	15 – 45 mm)		
Medium	30 – 65 mm)	1/2 of cap diameter	2/3 of cap diameter
Large	50 mm and over)		

(b) Flat mushrooms

<i>Size</i>	<i>Diameter of cap</i>		<i>Maximum length of stalk</i>	
	<i>Size limits</i>		<i>Cut mushrooms</i>	<i>Uncut mushrooms</i>
Small	20 – 55 mm)		
Large	50 mm and over)	2/3 of cap diameter	2/3 of cap diameter

Uniformity in size is compulsory for cultivated mushrooms of Class “Extra”. Cultivated mushrooms of Classes I and II must meet the specified size ranges if the terms “small”, “medium” or “large” are indicated.

IV. Provisions concerning tolerances

At all marketing stages, tolerances in respect of quality and size shall be allowed in each lot for produce not satisfying the requirements of the class indicated.²

A. Quality tolerances

(i) “Extra” Class

A total tolerance of 5 per cent, by number or weight, of cultivated mushrooms not satisfying the requirements of the class but meeting those of Class I is allowed. Within this tolerance not more than 0.5 per cent in total may consist of produce satisfying the requirements of Class II quality.

(ii) Class I

A total tolerance of 10 per cent, by number or weight, of cultivated mushrooms not satisfying the requirements of the class, but meeting those of Class II is allowed. Within this tolerance not more than 1 per cent in total may consist of produce satisfying neither the requirements of Class II quality nor the minimum requirements, or of produce affected by decay.

(iii) Class II

A total tolerance of 10 per cent, by number or weight, of cultivated mushrooms satisfying neither the requirements of the class nor the minimum requirements is allowed. Within this tolerance not more than 2 per cent in total may consist of produce affected by decay.

B. Special tolerances where the stage of development is indicated

	<i>Closed mushrooms</i>	<i>Veiled mushrooms</i>	<i>Open mushrooms</i>
“Extra” Class	5%, by number or weight, of veiled mushrooms are allowed	5%, by number or weight, of open mushrooms are allowed	5%, by number or weight, of flat mushrooms are allowed
Class I	10%, by number or weight, of veiled mushrooms are allowed	10%, by number or weight, of open mushrooms are allowed	10%, by number or weight, of flat mushrooms are allowed
Class II	25%, by number or weight, of veiled or open mushrooms are allowed	25%, by number or weight, of open mushrooms are allowed	25%, by number or weight, of flat mushrooms are allowed

C. Size tolerances

For all classes (if sized): a total tolerance of 10 per cent, by number or weight, of cultivated mushrooms not satisfying the requirements as regards sizing is allowed.

² A conformity check shall be made by assessing primary or composite samples. It is based on the principle of presumption that the quality of the randomly taken samples is representative of the quality of the lot. The OECD Operating Rules for Conformity Checks are recommended for application – also by operators – at the stages of dispatch as well as in wholesale and distribution centres and storerooms of food retail.

V. Provisions concerning presentation

A. Uniformity

The contents of each package must be uniform and contain only cultivated mushrooms of the same origin, commercial type, quality and size (if sized).

However, a mixture of cultivated mushrooms of distinctly different colours and/or species other than *Agaricus* may be packed together in a sales package, provided they are uniform in quality and, for each colour and/or species concerned, in origin. However, in case of those mixtures uniformity in size is not required.

The visible part of the contents of the package must be representative of the entire contents.

B. Packaging

The cultivated mushrooms must be packed in such a way as to protect the produce properly.

The materials used inside the package must be clean and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications, is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Packages must be free of all foreign matter including excessive casing material.

VI. Provisions concerning marking

Each package³ must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside:

A. Identification

Packer and/or dispatcher/exporter:

Name and physical address (e.g. street/city/region/postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority⁴ if the country applying such a system is listed in the UNECE Code Mark Registry⁵. In the case where there is no street address available, the physical address can be made up of the name of the farm or facility, the nearest village, town, region, and postal code; or GPS coordinates and a PO Box address together with nearest town, region and country shall be accepted as a physical address.⁶

B. Nature of produce

- If the contents are not visible from the outside:
 - “Cultivated mushrooms”

³ These marking provisions do not apply to sales packages presented in packages bearing these particulars. However, they do apply to sales packages (pre-packages) presented individually.

⁴ The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference “packer and/or dispatcher (or equivalent abbreviations)” has to be indicated in close connection with the code mark, and the code mark should be preceded by the ISO 3166 (alpha-2) country/area code of the recognizing country, if not the country of origin.

⁵ See <http://www.unece.org/trade/agr/codemarkregistry.html>.

⁶ Reservation by the United States of America on the use of a PO Box address, as it may not allow facility inspections or rapid intervention in case of recalls, and is not part of its national labelling requirement related to packer and/or dispatcher/exporter.

- “Cut” or “uncut”
- Colour if not “white”
- “Mixture of cultivated mushrooms”, or equivalent denomination, in the case of a mixture of distinctly different colours and/or species other than *Agaricus*. If the produce is not visible from the outside, the colours and/or species must be indicated.

C. Origin of produce

- Country of origin⁷ and, optionally, district where grown, or national, regional or local place name.
- In the case of a mixture of distinctly different colours and/or species, other than *Agaricus*, of cultivated mushrooms of different origins, the indication of each country of origin shall appear next to the name of the colour and/or species concerned.

D. Commercial specifications

- Class
- Size (if sized) expressed as minimum and maximum cap diameters or by the term “small”, “medium” or “large”
- Stage of development (optional).

E. Official control mark (optional)

Adopted 1970

Last revised 2012

Aligned with the Standard Layout 2023

The OECD Scheme for the Application of International Standards for Fruit and Vegetables has published an explanatory illustrated brochure on the application of this standard. The publication may be obtained from the OECD bookshop at: www.oecdbookshop.org.

⁷ The full or a commonly used name should be indicated.