CODEX ALIMENTARIUS COMMISSION

E

Food and Agriculture Organization of the United Nations

World Health Organization

Viale delle Terme di Caracalla, 00153 Rome, Italy - Tel: (+39) 06 57051 - E-mail: codex@fao.org - www.codexalimentarius.org

**PROJECT DOCUMENT**

# PROPOSAL FOR NEW WORK ON DEVELOPMENT OF A STANDARD FOR FRESH BROCCOLI

(Prepared by Mexico)

## 1. Introduction

Broccoli is an agricultural crop native to the Mediterranean region. This plant in the *Brassicaceae* family is believed to be a domesticated form of a wild species known as wild cabbage, which grew in the coastal regions of Italy and Greece.

Broccoli is a vegetable that possesses edible fleshy flower heads (flowers or nicolars) and tender parts of stems where the flower heads attach. It is consumed both raw and cooked. It is currently produced all over the world, both in open-field production systems and in greenhouses. There is a range of varieties of broccoli that are differentiated by their organoleptic characteristics (color, shape, size and flavor).

Broccoli is an agricultural crop that is of great importance both socially and economically. From a social point of view, the consumption of fresh broccoli has increased significantly. From an economic point of view, the cultivation of broccoli generates significant benefits for producers and the agricultural industry in general. It is a profitable crop due to its high demand and price in the markets. Its relatively short growth cycle allows farmers to obtain harvests in a relatively short time, allowing them to earn income quickly. In addition, broccoli can be grown in a wide range of climates and regions, allowing it to be produced in various parts of the world. This contributes to job creation in the agricultural sector and strengthens the local economy. In many regions, broccoli cultivation has become an important source of income for farmers and has contributed to the economic development of rural communities.

Broccoli cultivation presents promising prospects for growth in the agricultural market. In recent years, there has been a significant increase in consumer demand for broccoli.

The growth of the broccoli market is supported by the expansion of growing areas and the adoption of modern farming practices. Farmers are investing in improved cultivation techniques, such as selecting more resistant broccoli varieties adapted to different climatic conditions and soils. In addition, efficient production techniques are being implemented to maximize yield and minimize costs. These practices allow farmers to grow high-quality broccoli in sufficient quantities to meet growing demand.

The growth prospects of broccoli cultivation are also boosted by its export potential. Broccoli is a highly marketable product in international markets due to its nutritional value and popularity in global cuisine.

| **Raw broccoli (edible parts)<br>Nutritional value per 100 g.** | |
|---|---|
| Carbohydrates | 6.64 g |
| Sugars | 1.7 g |
| Dietary fibre | 2.6 g |
| Fats | 0.37 g |
| Proteins | 2.82 g |
| Water | 89.3 g |
| Retinol (vitamin A) | 31 µg (3%) |
| β-carotene | 361 µg (3%) |
| Thiamine (vitamin B1) | 0.071 mg (5%) |
| Riboflavin (vitamin B2) | 0.117 mg (8%) |
| Niacin (vitamin B3) | 0.639 mg (4%) |
| Pantothenic acid (vitamin B5) | 0.573 mg (11%) |
| Vitamin B6 | 0.175 mg (13%) |
| Vitamin E | 0.78 mg (5%) |
| Vitamin k | 101.6 µg (97%) |
| Calcium | 47 mg (5%) |
| Iron | 0.73 mg (6%) |
| Magnesium | 21 mg (6%) |

| | |
|---|---|
| Manganese | 0.21 mg (11%) |
| Phosphorus | 66 mg (9%) |
| Potassium | 316 mg (7%) |
| Zinc | 0.41 mg (4%) |
| % of the recommended daily allowance for adults | |
| Source: Raw Broccoli (Edible Parts) in United States Department of Agriculture (USDA) Nutrient Database | |

Many countries are increasing broccoli production to take advantage of export opportunities and generate additional revenue. In addition, broccoli is a versatile crop that can adapt to different climates and regions, expanding its reach and growth potential in various markets.

The emergence of the value-added fresh produce sector, which includes fresh broccoli pre-cut and packaged in florets, is contributing to the expansion of markets and helping to expand the future of the basic consumer basket globally.

## 2. The purpose and the scope of the standard

The aim of this proposal is to establish a global quality standard to protect consumer health and facilitate fair practice in international trade in broccoli (*Brassica oleracea* L. var. italica Plenck), hereinafter referred to as broccoli, in its fresh state. It addresses essential quality provisions, such as minimum requirements, quality classes, gauge sorting practices, quality and gauge tolerances, uniformity, and packaging and labeling requirements. In addition, safety issues applicable to this product will be addressed by cross-referencing relevant Codex texts developed by horizontal safety committees, e.g. hygiene, contaminants, pesticides, etc. (see point 3 for details).

The scope of the standard will cover fresh broccoli obtained from commercial varieties of *Brassica oleracea* var. italica, which will be supplied to consumers after preparation and packaging. Broccoli intended for industry is excluded.

**Relevance and opportunity:** Fresh broccoli is produced, marketed and consumed globally. It is not limited to any geographical region, which justifies the development of an internationally agreed standard covering commercial quality, labelling and aspects that ensure the innocence of fresh broccoli.

## 3. Main aspects to be covered

The most relevant points that will be considered are related to:

- Product Definition: Definition of the product as fresh broccoli, including common, commercial, and scientific name.
- Provisions relating to quality: including the minimum requirements to be met independently of the category.
- Size provisions: to be determined by the weight of the broccoli.
- Provisions relating to tolerances with respect to the quality and size allowed for packaging.
- Provisions relating to presentation: including uniformity of the contents of the packaging and the packaging used.
- Provisions for labelling and marking of the product in accordance with or in addition to the General Standard for the Labelling of Pre-Packaged Foods.
- Contaminant provisions with reference to the General Standard for Contaminants and Toxins in Food and Feed.
- Hygiene and handling provisions with reference to the Code of Hygienic Practice - General principles of food hygiene and other codes as appropriate.

## 4. Assessment against the Criteria for the Establishment of Work priorities

### General criterion

The development of a standard for broccoli would benefit all countries, in particular major producers, exporters and consumers. Broccoli quality needs to meet global trade and consumer demand, including minimum food safety requirements. The development of this standard will cover, among others, protecting the health of consumers and ensuring fair practices in the food trade.

**Criteria applicable to commodities**

**(a) Volume of production and consumption in each country, and volume and pattern of trade between countries**

**Broccoli production and trade data are combined with cauliflower and recorded and reported together. In addition, they share the same Harmonized Tariff Code (CAT) 0704.10.** Therefore, it is difficult to obtain more detailed international data sources on production and trade, which are necessary to support this proposal. However, the following data is available:

**Global production based on broccoli and cauliflower combined:** The global trend in broccoli production has increased between 2019 and 2023, as can be seen in the table below, according to FAO reports for 2019-2023.

**Table 1 - World broccoli/cauliflower Production 2019-2023**

| Year | Global broccoli production in thousands of tons. | Harvested area hectares. |
|---|---|---|
| 2019 | 26,042,771 | 1,382,919 |
| 2020 | 25,781,814 | 1,374,835 |
| 2021 | 26,205,412 | 1,393,136 |
| 2022 | 26,461,349 | 1,399,357 |
| 2023 | 26,472,040 | 1,404,930 |

Source: https://www.fao.org/faostat/es/#data/QCL

The top eleven producing countries as of 2023 were mainland China, India. United States of America, Mexico, Spain, Italy, Turkey, Bangladesh, Pakistan and France, as reported in Table 2:

**Table 2 - Main broccoli/cauliflower producing countries in the year 2023.**

| No. | Country | Harvested area (ha) | % | Production (ton) | % |
|---|---|---|---|---|---|
| 1 | China, Mainland | 495,859 | 35 | 9,712,996 | 37 |
| 2 | India | 491,000 | 35 | 9,548,000 | 36 |
| 3 | United States of America | 62,605 | 4 | 1,056,734 | 4 |
| 4 | Mexico | 41,722 | 3 | 768,354 | 3 |
| 5 | Spain | 39,630 | 3 | 637,080 | 2 |
| 6 | Italy | 14,157 | 1 | 367,566 | 1 |
| 7 | Türkiye | 14,720 | 1 | 355,200 | 1 |
| 8 | Bangladesh | 12,653 | 1 | 346,929 | 1 |
| 9 | Pakistan | 22,853 | 2 | 343,758 | 1 |
| 10 | France | 9,594 | 1 | 268,700 | 1 |
| 11 | Other | 200,138 | 14 | 3,062,053 | 12 |
|  | World | 1,404,930 |  | 26, 472,040 |  |

Source: https://www.fao.org/faostat/es/#data/QCL

The annual increase in broccoli production is directly attributed to the increase in international consumption, driven by awareness of its health benefits. This increase in production is facilitated by the expansion of cultivation areas and the adoption of modern agricultural practices. Farmers are investing in improved cultivation techniques, such as selecting disease- and drought-resistant broccoli varieties, adapted to different geoclimatic conditions. Likewise, new efficient production techniques are being implemented, both in the field and in greenhouses, to maximize yield and minimize costs. These practices allow farmers to grow high-quality broccoli in sufficient quantities to meet the growing demand.

**Exports/Trade:** Broccoli has seen significant growth in international agricultural trade in recent years. The largest trade flows of broccoli are mainly observed between the United States, Mexico and Spain. The United

States is recognized as the main exporter of broccoli, supplying various countries, while Mexico and Spain also stand out as important producers and exporters. These countries have established strong business relationships in the broccoli market, mutually benefiting from the growing demand for this crop around the world.

The top eleven exporting countries as of 2023 were Spain, Mexico, the United States of America, France, Italy, mainland China, the Netherlands, Canada, Guatemala, Iran, and Poland, among others:

**Table 3 – Main broccoli/cauliflower exporting countries**

| No. | Country | 2023 | | Average annual growth rate 2019-2023 % | | Share of exports % in 2023 |
|---|---|---|---|---|---|---|
| | | Tons | 1000 USD | TON | 1000 USD | |
| 1 | Spain | 376,386 | 685,504 | -1 | 9 | 29 |
| 2 | Mexico | 366,967 | 458,640 | 5 | 7 | 19 |
| 3 | United States of America | 108,519 | 134,388 | -3 | -5 | 6 |
| 4 | France | 273,756 | 290,640 | 23 | 30 | 12 |
| 5 | Italy | 83,017 | 152,735 | 4 | 16 | 6 |
| 6 | Mainland China | 159,873 | 262,494 | 14 | 34 | 11 |
| 7 | Netherlands (Kingdom of the) | 48,295 | 101,096 | 4 | 14 | 4 |
| 8 | Canada | 43,710 | 45,029 | 16 | 18 | 2 |
| 9 | Guatemala | 23,297 | 22,421 | -9 | 0 | 1 |
| 10 | Iran (Islamic Republic of) | 31,833 | 12,622 | -2 | -8 | 1 |
| 11 | Poland | 19,828 | 25,057 | 3 | 11 | 1 |
| | Other | 207,960 | 191,713 | -1 | -1 | 8 |
| | World | **1,743,441** | **2,382,339** | | | |

Source: https://www.fao.org/faostat/es/#data/TCL

**(b) Diversification of national legislation and apparent resultant or possible impediments to international trade**

There is currently no international standard for broccoli. However, two regional governmental organizations, the United Nations Economic Commission for Europe (UNECE) and the Association of Southeast Asian Nations (ASEAN), have developed a standard for broccoli. This demonstrates the relevance of this product for trade, so the harmonization of certain aspects, such as storage and quality, has already been achieved at the regional level. These aspects can be taken into account when developing the Codex standard for fresh broccoli.

Due to the lack of a global standard, international trade has been severely affected. Importers and exporters often prefer to market fresh fruit and vegetables based on a Codex standard. Therefore, this new work would provide an internationally harmonized quality standard to improve international trade in accordance with the Codex Manual of Procedures.

**(c) International or regional market potential**

As shown in Tables 1, 2 and 3, both broccoli production and trade are increasing globally. Therefore, the development of a quality standard will contribute to boosting trade by identifying common quality factors and harmonizing them across regions, relevant to the protection of consumer health and trade facilitation.

**(d) Amenability of the commodity to standardization**

The characteristics of broccoli, from cultivation to harvest, the varieties of cultivar, composition, quality and packaging, are suitable parameters for product standardization.

Considering that technical information is available and that some degree of harmonization has already been

achieved at the regional levels in certain aspects relevant to consumer protection and trade facilitation, as mentioned in item (b), further work to develop an inclusive standard on this globally traded product should be feasible and necessary to protect the health of consumers and ensure fair trade practices.

**(e) Coverage of main consumer protection and trade issues by existing or proposed general rules**

There are two regional standards that cover the essential quality factors specific to broccoli. However, they lack international legal recognition and acceptance of a Codex standard. The proposed standard will address issues related to minimum requirements, classes, size, colour, uniformity, packaging, etc. Safety issues will be addressed through cross-references to relevant Codex safety texts.

**(f) Number of products that would require independent standards, including whether they are raw, semi-processed, or processed.**

It is estimated that a single standard for fresh broccoli may cover the main varieties of fresh broccoli marketed worldwide.

**(g) Work already done by other international organizations in this field or suggested by relevant international intergovernmental bodies.**

No other international organization has developed an international standard for fresh broccoli that is inclusive of all countries or regions and encompasses essential quality and safety provisions to protect consumers' health and ensure fair business practices. However, two regional standards have been developed that could be considered during the development of the Codex Standard for broccoli:

- UNECE Standard on the Marketing and Commercial Quality Control of Broccoli, FFV-48, 01/02/1994, amendment 2023.
- Association of Southeast Asian Nations (ASEAN) Standard for Broccoli ASEAN Stan 48:2016).

## 5. Relevance to Codex strategic objectives

This proposal is consistent with the Codex Strategic Plan for 2020-2025, in particular Strategic Goal 2 (Objective 2.2) and Objective 3 (Objectives 3.1, 3.2 and 3.3).

In addition, strengthen the recognition of Codex as an international food standard-setting body to protect the health of consumers and ensure the application of fair practices in the food trade in accordance with the Codex Strategic Plan 2026-2031 Strategic Goals 1-4 as it is based on scientific considerations and contributes to establishing the minimum quality requirements of broccoli for human consumption, in order to protect consumer health and ensure fair practices in the food trade.

The Project also opens the opportunity to strengthen relations with other international organizations, promoting an integrated consensus-based approach, thereby maximizing the impact of Codex by increasing its visibility through the use of its standards, taking into consideration the transition to sustainable and resilient food systems, as well as the promotion of the "One Health" concept.

Expected accomplishments include:

- Carrying out forecasting activities to identify emerging needs.
- Strengthening scientific advice in decision-making.
- Continue to contribute to the development of food standards.
- Further harmonization of national standards with Codex standards.
- Increasing the active participation of members and observers in the project review process.

## 6. Information on the relationship between the proposal and other existing Codex documents as well as other ongoing work

The development of a Standard for fresh broccoli shall take into account references to relevant pre-existing Codex texts developed by the general committees, as follows:

- Databases related to maximum residue levels (MRLs) of pesticides published by the Codex Committee on Pesticide Residues in Food
- *Code of hygienic practice for fresh fruits and vegetables* (CXC 53-2003)
- *Code of practice for the packaging and transport of fresh fruit and vegetables* (CXC 44-1995)
- *Guidelines on the food import control system* (CXG 47-2003)
- *General standard for contaminants and toxins in food and feed* (CXS 193-1995)

- *General standard for food additives* (CXS 192-1995)
- *General standard for the labelling of pre-packaged foods* (CXS 1-1985)
- *General standard for the labeling of food packaging not intended for retail sale* (CXS 346-2021)
- *General principles of food hygiene* (CXC 1-1969)
- *Principles and guidelines for the establishment and application of microbiological criteria in food* (CXG 21-1997).

**7. Identification of any requirement for and availability of expert scientific advice**

No scientific expert opinion is currently envisaged.

**8. Identification of any need for technical input to the Standard from external bodies so that this can be planned for**

No technical input is currently envisaged.

**9. The proposed timeline for completion of the new work**

The development of this standard is expected to take place in three or fewer CCFFV sessions, depending on the agreement reached by the CCFFV.