

# CODEx ALIMENTARIUS COMMISSION



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

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Agenda Item 7.1

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## JOINT FAO/WHO FOOD STANDARDS PROGRAMME

### CODEX COMMITTEE ON FATS AND OILS

Twenty-Seventh Session

Virtual, 18 - 26 October 2021

### PROPOSALS FOR NEW WORK

(Replies to CL 2019/54-FO)

### PART I - PROPOSED AMENDMENT/REVISION TO THE CODEX STANDARD FOR

#### NAMED VEGETABLE OILS

#### (CXS 210-1999), - INCLUSION OF CAMELLIA SEED OIL

#### DISCUSSION PAPER

(Submitted by the People's Republic of China)

## INTRODUCTION

Codex Alimentarius Secretariat issued CL 2021/36/OCS-FO, Request for comments on the proposals for new work and or amendments to existing Codex Standards, in which China submitted the Proposed amendment/revision to the codex standard for named vegetable oils (CXS 210-1999), - inclusion of camellia seed oil. Upon reviewing the comments from Codex member countries (CX/FO 21/27/8 Add.1), China revised the proposal adding the camellia seed oil production and international trade data as well as some peer-reviewed research papers.

Therefore, China submits this revised and updated proposal for amending/revising the codex standard for named vegetable oils (CXS 210-1999), - inclusion of camellia seed oil.

## RECOMMENDATION

The committee is invited to consider the revised proposal for amending/revising the codex standard for named vegetable oils (CXS 210-1999), - inclusion of camellia seed oil. The project document is attached as Appendix to this document.

**PROPOSED AMENDMENT/REVISION TO THE CODEX STANDARD FOR NAMED VEGETABLE OILS  
(CXS 210-1999), - INCLUSION OF CAMELLIA SEED OIL  
PROJECT DOCUMENT**

New text is indicated in **bold/underline**. Text to be removed is indicated in ~~strikethrough~~.

## 1. PURPOSE AND SCOPE

The purpose of this new work is to amend the Codex Standard for Named Vegetable Oils (CXS 210-1999) to include camellia seed oil derived from the seed of camellia (*Camellia oleifera Abel ~~Abeel~~*), which has **been scientifically proven to enhance** ~~enhanced~~ functionality **and benefit health** due to its high oleic acid content (68–87%) and abundant natural antioxidants<sup>1 2 3</sup>. The amendment would enable Codex member countries and the food industry to appropriately characterize, name, and market camellia seed oil developed for ~~improved functional and~~ nutritional benefits for consumers and **diverse uses for** the food processing industry.

The scope of this work is the addition of camellia seed oil in the Codex Standard for Named Vegetable Oils (CODEX STAN 210-1999). The compositional characteristics will be provided for associated tables in the Standard.

## 2. RELEVANCE AND TIMELINESS

~~With its extremely similar fatty acid profiles and physicochemical properties to those of olive oil, camellia seed oil is therefore honored as the “oriental olive oil” and “the king of cooking oil”.~~ **Camellia seed oil is derived from the seeds of camellia (*Camellia oleifera Abel*). Camellia has a long cultivation history, spanning over 2300 years, and has been cultivated extensively as an oil crop in many countries, including China, the Philippines, India, Brazil and South Korea<sup>3</sup>. Unlike other seed-oil plants that are grown on arable land, camellia normally grow on mountain slopes, which allows new crops to make full use of marginal land. Today, Camellia seed oil serves as the main cooking oil in China’s southern provinces. Camellia seed oil** is rich in oleic acid (68–87%). ~~Meanwhile, camellia seed oil also~~ **and** contains a multitude of natural antioxidants, such as squalene, phytosterol ( $\beta$ -sitosterol, campesterol and stigmasterol), polyphenols, fat-soluble vitamins (Vitamins A, ~~B~~, E), sasanquasaponin, and other functional substances<sup>1-3</sup>. These components with various biological activities are useful for lowering triglycerides and cholesterol, thus preventing hypertension, heart disease, arteriosclerosis, and other diseases. Also, it could be used as a base oil for high-level skin care oil through further intensive processing.



The flower and fruits of Camellia



The Camellia fruits



Camellia seed oil

**Figure 1 The Camellia plant and Camellia seed oil**

To facilitate international trade in food products and ingredients, Codex standards often are used as the basis for names and specifications for such products to ensure fair trade practices. ~~It has been confirmed that~~

~~camellia seed oil enhances functionality attributes as above.~~ **With its health benefits**, Camellia seed oil usage is expected to experience rapid growth over the next several years<sup>4</sup>. ~~Since this oil will be utilized in expanded amounts due to its favorable characteristics,~~ **Therefore**, it is important for it to have consistent naming and specifications to ensure **the product quality and fairness** for international trade.

### 3. MAIN ASPECTS TO BE COVERED

The proposed new work to amend the Codex Standard for Named Vegetable Oils (CXS 210-1999) to include camellia seed oil I will include the following aspects :

- Description
- Essential composition and quality factors
- Establishment of general requirements for camellia seed oil derived from the seed of camellia (*Camellia oleifera* ~~Abel~~*Abel*)
- Establishment of specific requirements for camellia seed oil
- 2.1 Product definition. Include the description camellia seed oil
- 3.0 Composition and quality factors
- Table 1. Include the fatty acid composition of camellia seed oil
- Table 2 Quality characteristics of camellia seed oils
- Other quality and compositional factors
- Table 3, and Table 4 the content of sterol and tocopherol will be proposed.

~~The preliminary results indicate that the contents of  $\beta$ -sitosterol and  $\alpha$ -tocopherol in camellia seed oils are 106-820 mg/kg and 153-771 mg/kg, respectively.~~

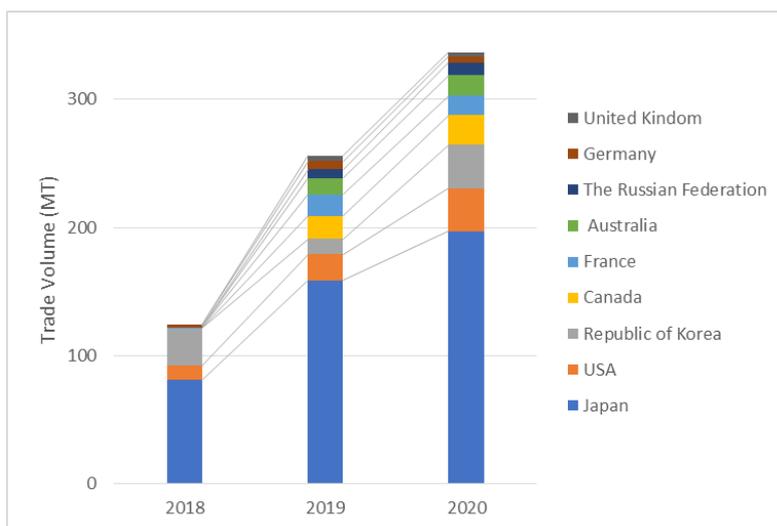
### 4. ASSESSMENT AGAINST THE CRITERIA FOR THE ESTABLISHMENT OF WORK PRIORITIES

*This proposal is consistent with the Criteria for the Establishment of Work Priorities applicable to both commodities and general subjects.*

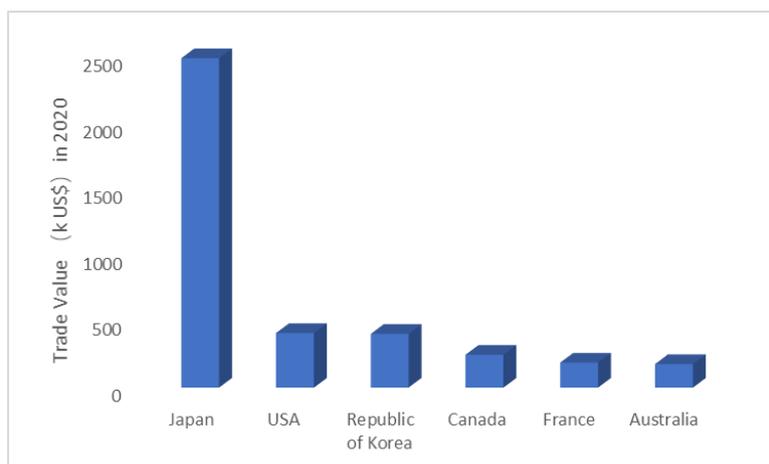
**(a) Volume of production and consumption in individual countries and volume and pattern of trade between countries.**

**Camellia is a kind of evergreen tree cultivated in subtropical region. It is one of the four largest woody oil plants (others are oil palm, olive, coconut) in the world. Affected by geographical and climatic conditions, Camellia is mainly grown in East Asia and Southeast Asia, such as China, Japan, Vietnam, Thailand, etc. In China, the area under Camellia cultivation has increased each year, from 45 million mu in 2008 to 68 million mu in 2019 (1mu = 666.667m<sup>2</sup>)<sup>5</sup>.** In China, the production of camellia seed has been increased year by year, and reached 2.68 million tons in 2019, Around 700 kilo tons of camellia seed oil were produced **in 2019** for different purpose, and 600 kilo tons of camellia seed oil is estimated to be consumed in food market.

According to the data from the General Administration of Customs of China, in 2018 and 2019, a total of 171 and 262 tons of camellia seed oil was exported, of which worth \$2.05 million (USD) and \$3.24 million (USD). These numbers went up to 338 tons and \$4.17 million (USD) in 2020, **almost doubled compared to 2018**. More than 15 countries import camellia oil from China, the top trading partners are Japan, USA, **Republic of Korea**, Canada, France, and Australia ~~and Korea~~.



**Figure 1 Camellia seed oil exports in Metric ton by main destinations from 2018 year to 2020 year.**  
**(Data from the General Administration of Customs of China)**



**Figure 2. The trade value of Camellia seed oil by top trading partners in 2020.**  
**(Data from the General Administration of Customs of China)**

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

The voluntary National Standard for camellia seed oil (GB/T 11765) in China was first published in 2003 and revised in 2018, which establishes the general specifications of camellia seed oil for domestic market. **Food Chemicals Codex (FCC) responsible by United States Pharmacopeia published the standard of Camellia Seed (*Camellia oleifera*) Oil in 2018.**

**According to feedback from main camellia seed oil export companies, the current international market has different requirements for Camellia Seed specifications.** With the potential increased demand in international market, the proposed amendment for camellia seed oil to the Codex Standard for Named Vegetable Oils (CODEX-Stan 210-1999) will help to promote the wide-recognized, science-based standards, **assure product quality, protect consumer's health,** and facilitate global trade in camellia seed oil. Without such a standard, it is expected that national legislations or standards will differ, which may affect international trade in this product. In addition, it is expected that the lack of a Codex standard might trigger proliferation of

private standards for this oil and contribute to the confusion and deceptive practices in trade in oils that are unsuitable for their intended uses.

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

As indicated above, a significant international and regional market potential exists, especially as global health authorities call for the use of nutritionally preferred alternatives to edible oils that are high in saturated fatty acids. **A report published by ABSOLUTE REPORTS in 2019 showed that in the coming years there will be an increasing demand for Camellia Oil in the regions of USA, Europe and China, the worldwide market for Camellia Oil is expected to grow at a CAGR of roughly 5.6% over the next five year<sup>6</sup>.**

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

This is a proposed amendment to the Codex Standard for Named Vegetable Oils (CODEX-Stan 210-1999) to include camellia seed oil. The addition of this oil including essential factors related to composition, health and quality would enable the standardization of oils of this type and contribute to consumer protection.

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

As indicated above, development of a Codex standard for camellia seed oil will enhance consumer protection by discouraging food fraud practices and the development of private standards.

**(f) Number of commodities which would need separate standard indicating whether raw, semi-processed or processed**

Not relevant.

**(g) Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental body(ies)**

None known.

**5. RELEVANCE TO THE CODEX STRATEGIC OBJECTIVES**

***~~The proposed amendment to the Codex Standard 210 is appropriate to Goal 1, Promoting Sound Regulatory Frameworks.~~***

~~As indicated in this Goal, “the CAC will provide essential guidance to its members through the continued development of international standards and guidelines relating to food safety and hygiene, nutrition, labeling, and import/export inspection and certification and quality of the food stuff.”~~

~~Specifically, as stated in bullet #1, “the CAC will develop international standards, guidelines and recommendations based on scientific principles...that can serve as a model for member of the CAC to pursue food regulatory systems that provide consumers with safe food and ensure fair practices in the food trade.”~~

~~Further, under bullet #2, it is noted that “Codex standards for food quality should focus on essential characteristics of products to ensure that they are not overly prescriptive and that the standards are not more trade restrictive than necessary.” The proposed amendment to Codex Standard 210 will facilitate fair trade in camellia seed oil.~~

~~The work would also focus on essential characteristics, taking into consideration the technical and economic implications for all Codex members.~~

**As the focus and needs of establishing a Codex standard for camellia seed oil is observed in international trade, this proposed amendment is in accordance with the Goal 1 of Codex Strategic Plan 2020-2025: Address current, emerging and critical issues in a timely manner.**

**Specifically, regarding objective 1.1, “Identify needs and emerging issues”, this proposed amendment serves as a proper respond to the need of promoting fair trade of camellia seed oil.**

**Further, regarding objective 2.2, “Prioritize needs and emerging issues”, with current time manner, the proposed amendment will become the essential standard for Codex members with camellia seed oil trade, meanwhile the potential of camellia seed oil trade will be observed by all Codex members.**

#### **6. INFORMATION ON THE RELATION BETWEEN THE PROPOSAL AND OTHER EXISTING CODEX DOCUMENTS**

None.

#### **7. IDENTIFICATION OF ANY REQUIREMENT FOR AND AVAILABILITY OF EXPERT SCIENTIFIC ADVICE**

**None. If expert scientific advice is required, we’re committed to provide the contact of experts who are responsible for the proposed text and the research papers.**

#### **8. IDENTIFICATION OF ANY NEED FOR TECHNICAL INPUT TO THE GUIDELINES FROM EXTERNAL BODIES THAT CAN BE PLANNED**

**None. Relevant SDOs, such as ISO, AOCS, are expected to participate in the review of the Codex standard.**

#### **9. PROPOSED TIMELINE FOR COMPLETION OF THE NEW WORK, INCLUDING THE START DATE, THE PROPOSED DATE FOR ADOPTION AT STEP 5/8, AND THE PROPOSED DATE FOR ADOPTION BY THE COMMISSION**

Timeline:

- Project document and new work agreed **introduction** at 27th Session of CCFO27
- Approval of new work by CAC44
- **Discussion**-Consideration of the Proposed Draft **at two CCFO Session**
- Adoption of the Draft Amendment to CXS 210 – 1999 ~~at Step 5/8 by CAC 46 (2023)~~ .



## PROPOSED DRAFT CODEX STANDARD FOR CAMELLIA SEED OILS

### 2. DESCRIPTION

#### 2.1 Product definition

Camellia seed oil is derived from the seed of camellia (*Camellia oleifera* Abel). ~~Abel~~

### 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

#### 3.1 GLC ranges of fatty acid composition (expressed as percentages)

Samples falling within the appropriate ranges specified in Table 1 are in compliance with this Standard.

Table 1 Fatty acid composition of camellia seed oils (expressed as percentage of total fatty acids)

Fatty acid	<b>Proposed</b> Content (%)
C14:0	ND-0.8
C16:0	3.9-14.5
C16:1	ND-0.2
C18:0	0.3-4.8
C18:1	68.0-87.0
C18:2	3.8-14.0
C18:3	ND-1.4
C20:0	ND-0.5
C20:1	ND-0.7
C22:1	ND-0.5
C24:1	ND-0.5

ND - Non-detectable, defined as  $\leq 0.05\%$ .

### APPENDIX

#### Other Quality and Composition factors 1. Quality Characteristics

Matter volatile at 105°C	≤0.2% m/m
Insoluble impurities	≤0.2% m/m
Peroxide value	≤10 milliequivalents of active oxygen/kg oil
Acid value	≤4.0 mg KOH/g Oil

### 3. CHEMICAL AND PHYSICAL CHARACTERISTICS

Chemical and Physical Characteristics are given in Table 2.

Samples falling within the appropriate ranges specified in Table 2 are in compliance with this Standard.

Table 2 Quality characteristics of camellia seed oils

Quality characteristic	Value
Relative density (20°C/water at 20°C)	0.912-0.922
Refractive index (ND 40°C)	1.460-1.464

Saponification value (mg KOH/g oil)	193-196
Iodine value	83-89
Unsaponifiable matter (g/kg)	≤15

## 9. OTHER QUALITY AND COMPOSITIONAL FACTORS

The content of sterol and tocopherol will be proposed. The preliminary results indicate that the contents of  $\beta$ -sitosterol and  $\alpha$ -tocopherol in camellia seed oils are 106-820 mg/kg and 153-771 mg/kg, respectively.

Table 3 Content of other camellia seed oil nutrients

Quality characteristic	Value
Phytosterol	100-4000 mg/kg
Tocopherol	70-1000 mg/kg

Table 3 Tocopherol composition for camellia seed oil

<u>Tocopherol</u>	<u>Proposed value</u>
<u><math>\alpha</math>-tocopherol</u>	<u>30-950</u>
<u><math>\beta</math>-tocopherol</u>	<u>0-11</u>
<u><math>\gamma</math>-tocopherol</u>	<u>2-56</u>
<u><math>\delta</math>-tocopherol</u>	<u>0-28</u>
<u>Total</u>	<u>70-1000</u>

Table 4 Phytosterol composition for camellia seed oil

<u>Phytosterol</u>	<u>Proposed value</u>
<u>Campesterol</u>	<u>5-40</u>
<u>Stigmasterol</u>	<u>10-260</u>
<u><math>\beta</math>-sitosterol</u>	<u>30-2400</u>
<u><math>\Delta</math>5-avenasterol</u>	<u>2-95</u>
<u><math>\Delta</math>7-stigmastenol</u>	<u>40-2000</u>
<u><math>\Delta</math>7-avenasterol</u>	<u>3-130</u>
<u>Others</u>	<u>3-110</u>
<u>Total</u>	<u>100-4000</u>

## 10. METHODS OF ANALYSIS AND SAMPLING

The recommended methods in CXS 210-1999 and CXS 234-1999 are applied to Camellia seed oil.

<sup>1</sup> Yang Ruinan, et al. A review of chemical composition and nutritional properties of minor vegetable oils in China, Trends in Food Science & Technology, Volume 74, 2018, Pages 26-32.

<sup>2</sup> Xiaoqin Wang, et al. Profiling and quantification of phenolic compounds in Camellia seed oils: Natural tea polyphenols in vegetable oil, Food Research International, Volume 102, 2017, Pages 184-194.

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- <sup>3</sup> Fei Luan, et al. Recent advances in *Camellia oleifera* Abel: A review of nutritional constituents, biofunctional properties, and potential industrial applications, *Journal of Functional Foods*, Volume 75, 2020, 104242.
- <sup>4</sup> Liang, H., et al. *Camellia* as an Oilseed Crop, *HortScience horts*, 2017,52(4), 488-497.
- <sup>5</sup> Source: the website of China State Administration of Forestry and Grassland, <http://www.forestry.gov.cn/>
- <sup>6</sup> Source: <https://www.absolutereports.com/global-camellia-oil-market-13837567>