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CODEX COMMITTEE ON FATS AND OILS
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**PART VI - PROPOSED AMENDMENT/REVISION TO THE CODEX STANDARD, FOR NAMED
VEGETABLE OILS**

(CXS 210-1999), - INCLUSION OF HIGH OLEIC ACID SOYA BEAN OIL

DISCUSSION PAPER

(Submitted by the United States of America)

The United States appreciates the opportunity to update the following new work proposal to address Members' comments found in CX/FO 21/27/8 Add.1. Specifically, the United States has updated the proposal to include additional information on the volume and patterns of trade of high oleic soyabean oil and essential composition and quality factors (fatty acid composition to show high oleic acid value). The updated sections are highlighted below.

BACKGROUND

1. The proposal for new work to amend the Codex standard for named vegetable oils, to include a standard for high oleic soyabean oil, was submitted by the United States of America in previous sessions of CCFO22 and CCFO23.
2. In CCFO24, the Committee agreed to discontinue consideration of new work on including high oleic acid soya bean oil to the standard for named vegetable oils, pending resubmittal "when higher volumes of HOSO would be traded internationally" (para 82 of CCFO24 report).
3. The production and international trade for high oleic acid soya bean oil has significantly increased in the last few years and it is expected to continue rising further.

INTRODUCTION

1. Soya bean is a highly traded commodity as evident by the import (Figures 1) and export (Figure 2) values (million USD) in 2020. The world production of soya beans in 2019-20 was 339.42 million metric tons, which is more than half of world production for total oilseeds (580.6 million metric tons).

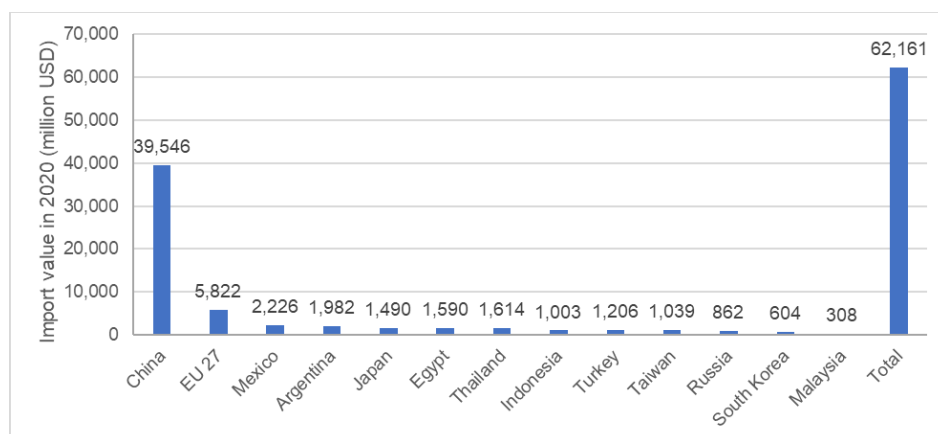


Figure 1. Soya bean import value in 2020.

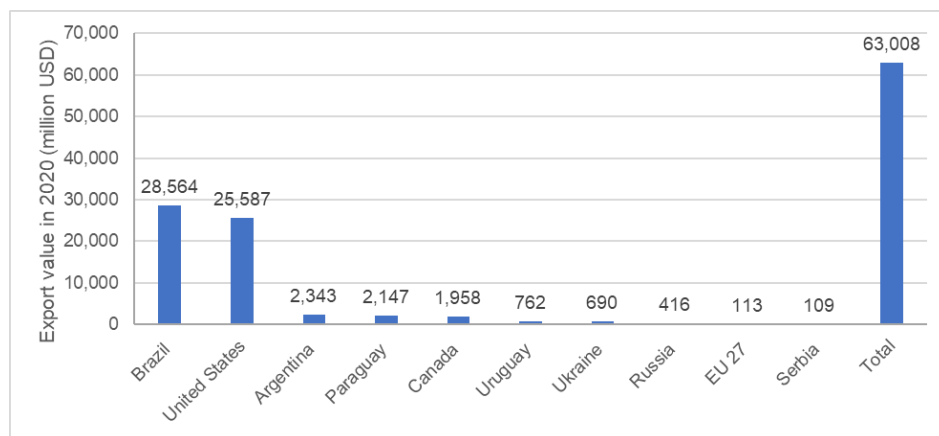


Figure 2. Soya bean export value in 2020.

2. Vegetable oils are increasingly traded based on functionality in formulations and as cooking mediums of foods. Further, vegetable oil type mixtures are being used to enhance functional stability without using chemical hydrogenation. There also has been a shift in endpoint usage of vegetable oils and fats. Soya bean oils are used in a wide variety of processed foods. In 2020, about 66 percent of all vegetable oils used in edible products in the United States was soya bean oil (source: STATISTA.com). Soya bean oil is used in food manufacturing and frying, where increased oil stability and extended shelf life in processed foods are critical.
3. The food industry is continuously developing oils and fats to meet the functional and/or nutritional needs of its end users. High oleic acid soya bean oil entered the U.S. marketplace in limited quantities for performance testing by food companies in 2010. Such testing by food manufacturers and restaurants confirmed that high oleic acid soya bean oil enhances functional attributes.
4. Due to the desirable attributes of high oleic acid soya bean oil, a shift in the soya bean oil market can be expected similar to that observed for sunflower and safflower oil in the past, indicating further potential for increased production and trade of high oleic acid soya bean oil.

HIGH OLEIC ACID SOYA BEAN OIL – PROPERTIES AND VARIETIES

5. High oleic acid soya bean oil is nutritionally enhanced as it contains high monounsaturated fatty acids while both saturated fatty acids and undesirable trans fats are reduced. The functional properties of the high oleic soya bean oil include improved oil stability performance in high heat applications such as deep frying, and improved shelf-life.
6. High oleic acid soya beans and their products are segregated from conventional soya beans in production, crushing and refining, and are marketed under identity preservation systems. High oleic acid soya bean varieties have been produced by advanced plant breeding, biotechnology-based methods or their combination. There are at least three varieties developed or grown in the United States. Additional varieties are either developed or grown in other countries such as Canada, Ukraine and India. Because of the improved functional properties of high oleic acid soya bean oil, it is anticipated that the new oil will continue to develop rapidly and commercialize further.

HIGH OLEIC ACID SOYA BEAN OIL – PRODUCTION AND TRADE

7. The production of high oleic acid soya bean oil has increased in recent years and the rise is expected to continue (Figure 3).

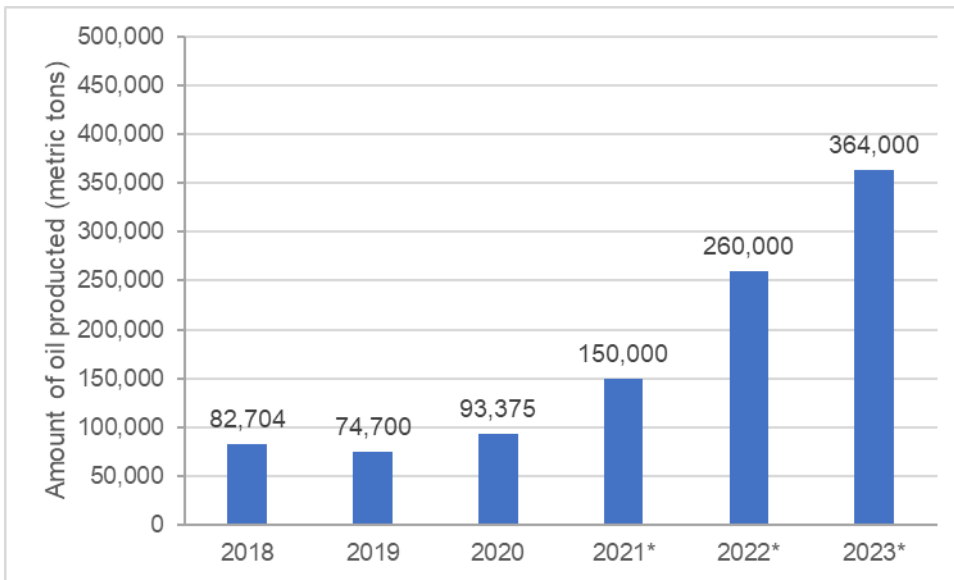


Figure 3. Production of high oleic acid soya bean oil in the United States (*estimates).

8. The international trade of high oleic acid soya bean oil is relatively high compared to other specialty oils. The United States export of high oleic acid soya bean oil or beans of this variety for 2021 is 7,325 metric tons, which is about 4.9% of total high oleic acid soya bean oil estimated to be produced by the United States in that year. This is over 20-fold increase as compared to the 300 metric tons exported in 2020. There is a high domestic demand for this oil and therefore it commands a higher price over soybean oil, providing a favorable market for domestic sale. Though the oil production has consistently increased over years (Figure 3), its demand outpaces the supply. As more planted area for soybeans producing high oleic acid oil increases, international trade is expected to increase further.

9. The international trade of 7,325 metric tons includes countries such as Canada, Costa Rica, Dominican Republic, Japan (oil extracted from exported whole beans), Mexico and South Korea (Figure 4). In addition, some high oleic acid soya beans or its oil will be exported to Malaysia later this year. The high oleic acid soya bean oil market is expected to rise rapidly as other countries begin production or trade of high oleic acid soya bean oil. Currently, Canada trades approximately 1000 metric tons of high oleic acid soya beans grown in the country. In addition, high oleic acid soya beans are also grown in Ukraine and India. Including high oleic acid soya bean oil in CXS 210-1999 is essential to facilitate fair trade of this oil and promote trade.

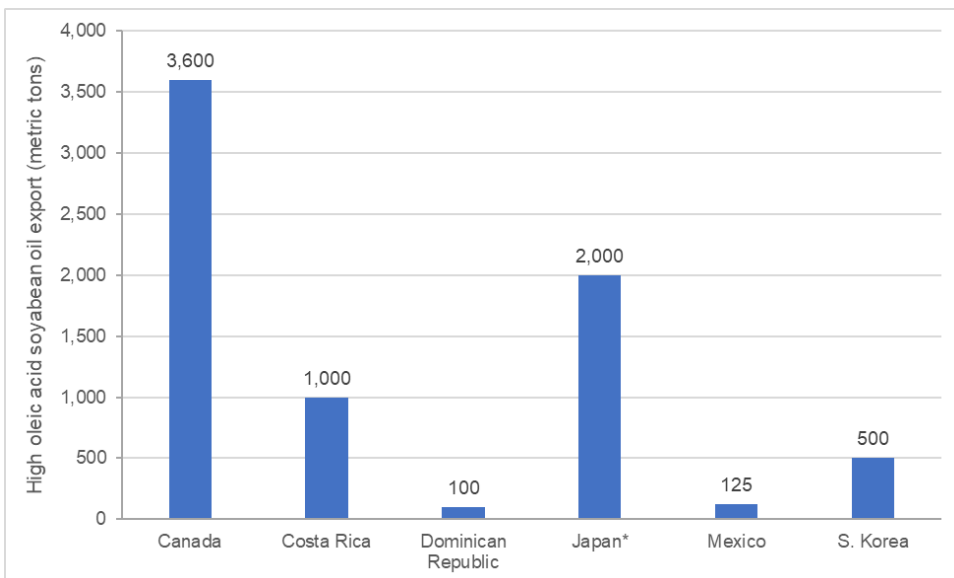


Figure 4. Export of high oleic acid soya bean oil (*volume from exported soya beans).

RECOMMENDATION

10. It is recommended that the Codex Committee on Fats and Oils agree to amend/revise the Codex Standard for Named Vegetable Oils (CXS 210-1999) to include high oleic acid soya bean oil. The Project Document is provided along with the proposed Essential Composition and Quality Factors in the Annex.

PART VI - PROPOSED AMENDMENT/REVISION TO THE CODEX STANDARD, FOR NAMED VEGETABLE OILS**(CXS 210-1999), - INCLUSION OF HIGH OLEIC ACID SOYA BEAN OIL****PROJECT DOCUMENT**

(Submitted by the United States of America)

This project document has been developed according to the Codex Alimentarius Commission Procedural Manual 27th Edition, 2019 Section II, Procedures for the Elaboration of Codex Standards and Related Texts, part 2. Critical review, proposals to undertake new work or to revise a standard (page 31).

PURPOSE AND SCOPE OF THE REVISION TO THE CODEX STANDARD

The purpose of this new work is to revise the Codex Standard for Named Vegetable Oils [CXS 210-1999, Adopted 1999. Revisions 2001, 2003, 2009, 2017, 2019. Amendment 2005, 2011, 2013, 2015, 2019] to include high oleic acid soya bean oil (also called high oleic acid soybean oil or high oleic soybean oil), which has enhanced functionality due to its relatively high oleic acid content. The revision would enable Codex member countries and the food industry to characterize, name, and market appropriately high oleic acid soya bean oil developed for improved functional and nutritional benefits for consumers and the food processing industry. Another purpose is to facilitate fair trade practices and to provide a new standard that is consistent with the two current Codex Standards for high oleic acid sunflower oil and high oleic acid safflower oil.

Functional benefits for high oleic acid soya bean oil include improved oil stability performance where high heat applications are involved (deep frying), longer shelf life for foods in which it is an ingredient (snack foods), and "neutral flavor" for foods prepared using the oil. Nutritional benefits include an increase in monounsaturated fatty acids and a decrease in both saturated fatty acids and undesirable trans fats.

The scope of work is an assessment of the changes in the named fatty acids when compared with the soya bean oil currently listed in the Codex Standard for Named Vegetable Oils [CXS 210-1999]. Other compositional characteristics for high oleic acid soya bean oil will be provided for in the Standard, including new columns in the tables of fatty acid composition (Table 1), chemical and physical characteristics (Table 2), desmethylsterol composition (Table 3), and tocopherol and tocotrienols (Table 4).

RELEVANCE AND TIMELINESS

To facilitate international trade in food products and ingredients, Codex standards are often used as the basis for names and specifications for such products to ensure fair trade practices. Since high oleic acid soya bean oil will be utilized in increasing amounts due to its favorable characteristics, it is important for it to have consistent naming and specifications to ensure fair trade domestically and internationally. Consideration to revise CXS 210-1999 to include high oleic acid soya bean oil would require relatively little time and would make efficient use of limited CCFO resources since the major factor affected is fatty acid composition.

It is important that Codex consider new work to include high oleic acid soya bean oil in CXS 210-1999. Codex has already developed standards for oils from other enhanced oleic acid oilseed varieties (e.g., high oleic acid sunflower seed, mid-oleic acid sunflower seed, high oleic acid safflower seed), thus recognizing the need for individual standards to distinguish the oils in the marketplace. High oleic acid vegetable oils have significantly improved oxidative stability providing favorable functionality in a variety of foods as ingredients or cooking mediums. High oleic acid soya bean oil contributes significant stability to foods in which it is used as well as avoids the development of undesirable components such as trans fats by eliminating the need for chemical hydrogenation. High oleic acid soya bean oil also has lower levels of saturated fat, which many countries have identified as a food component that should be reduced in the diet. High oleic acid soya bean oil has a distinctive fatty acid profile and other characteristics that are significantly different than the soya bean oil currently listed in the standard and should be appropriately reflected as a separate commodity in the Codex standard.

MAIN ASPECTS TO BE COVERED

The proposed new work to add high oleic acid soya bean oil to CXS 210-199 will be developed according to existing procedures for Codex standards and will include, but not be limited to, the following:

- Scope
- Description
- Essential composition and quality factors
- Food additives
- Contaminants
- Hygiene
- Labeling

- Methods of analysis and sampling
- Other quality and compositional factors

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.

Data of the U.S. Department of Agriculture (USDA) indicate that:

- In 2019-20, world production of total oilseeds was 580.6 million metric tons.
- In 2019-20, world production of soya beans was 339.42 million metric tons.
- In 2019-20, global production of soya bean oil was 56.78 million metric tons

These data are provided to indicate the large market share of soya beans in the total global marketplace of oilseeds. New soya bean varieties whose oil contains new traits to improve health and functionality in foods are expected to gain significant market share of that currently held by traditional soya beans. High oleic acid soya bean oil is currently being favorably received in the United States and its trading partners and will likely experience considerable growth within the next several years.

Mid-oleic acid sunflower oil became commercially available in 1998. By 2005, it gradually captured a majority of the sunflower oil market in North America. High oleic acid sunflower oil similarly became available in the mid-2000s. Codex Standards for both were adopted. Because the improved functionality of mid- and high oleic acid oils is now more widely recognized than it was in the 1990s and 2000s, especially for use in frying and processed foods, it is anticipated that demand for high oleic acid soya bean oil will increase rapidly as it did for mid- and high-oleic sunflower oils.

The production and use of high oleic acid soya bean oil in the US is presented in Table 1. In 2020, high oleic acid soya beans were cultivated in 141,643 hectares and 93,375 metric tons of oil was produced (\$ 82.36 million using an average price of \$ 0.40 per pound of oil). The international trade in 2020 was 300 metric tons. In addition to the US, the high oleic acid soya beans are also cultivated in Canada, Ukraine and India. The demand for high oleic acid soya bean oil is currently greater than the supply and continues to grow in domestic and international market because of its favorable functional properties. The soya bean industry is trying to increase the supply by planting more acres of high oleic acid soya beans and it is anticipated to reach 560,000 hectares by 2023. The production and export of high oleic acid soya bean oil in 2023 is anticipated to be 364,000 metric tons and 30,000 metric tons, respectively. The international trade volume can be affected by market conditions, acreage planted, climate, demand, government programs, etc. It is estimated that 150,000 metric tons of high oleic acid soya bean oil will be produced in 2021. In 2021, at least 7,325 metric tons of high oleic acid soya beans or the extracted oil have been traded in various countries including Canada, Costa Rica, Dominican Republic, Japan (export whole beans), Mexico and South Korea. In addition, Malaysia may also be involved in its trade later this year.

Table 1. Production and use of high oleic acid soya bean oil in the United States.

| Crop year | Area of cultivation (hectares) | Amount of oil produced (metric tons) | International trade (metric tons) |
|-----------|--------------------------------|--------------------------------------|-----------------------------------|
| 2019 | 113,314 | 74,700 | NA ² |
| 2020 | 141,463 | 93,375 | 300 |
| 2021 | 242,900 ¹ | 150,000 ¹ | 7,325 ³ |

¹Estimate; ²NA – not available due to small volume; ³Includes export of high oleic acid soya beans.

- b) Diversification of national legislations and apparent resultant or potential impediments to international trade.

The proposed revision to the Codex Standard for Named Vegetable Oils (CXS 210-1999) will facilitate global trade in high oleic acid soya bean oil. Without such a standard, it is expected that national legislations will differ, which will adversely 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 and also those that contain trans fats.

d) Amenability of the commodity to standardization.

This is a proposed revision to the Codex Standard for Named Vegetable Oils (CXS 210-1999) to include high oleic acid soya bean oil. High oleic acid soya bean oil is readily amenable to inclusion in that standard; many of its characteristics are the same as high oleic acid safflower and sunflower oils, which are already in the standard. High oleic acid soya bean oil is a well characterized material and, other than oleic acid and linolenic acid, most of its characteristics are identical to soya bean oil, a material that is already listed in the standard.

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

As indicated above, development of a Codex standard that includes high oleic acid soya bean oil will enhance consumer protection by discouraging deceptive 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.

RELEVANCE TO THE CODEX STRATEGIC OBJECTIVES

The proposed revision to the Codex Standard for Named Vegetable Oils (CXS 210-1999) is appropriate to Goal 1 (Address current, emerging and critical issues in a timely manner) of the Codex Strategic Plan 2020-2025.

As indicated in Goal 1, "Codex will need to be proactive and flexible and to respond in a timely manner to the opportunities and challenges that result."

There are two objectives within Goal 1:

- (i) The outcome for objective 1.1 (Identify needs and emerging issues) is "Improved ability of Codex to develop standards relevant to the needs of its members," and the indicator is "The number of emerging issues identified by subsidiary bodies".
- (ii) The outcome for objective 1.2 (Prioritize needs and emerging issues) is "Timely Codex response to emerging issues and the needs of members," and one of the indicators is "Proportion of identified, prioritized emerging issues that lead to proposals for new work".

The proposed revision to CXS 210-1999 will facilitate fair trade in high oleic acid soya bean oil that otherwise, according to the commodity oil, would be inaccurately termed "soya bean oil".

The work would also focus on essential characteristics, taking into consideration the technical and economic implications for all Codex members and in particular for developing countries, many of which are net edible oil importers.

INFORMATION ON THE RELATION BETWEEN THE PROPOSAL AND OTHER EXISTING CODEX DOCUMENTS

Codex has developed standards for many other edible fats and oils found in the following Codex standards:

- Standard for Named Vegetable Oils (CXS 210-1999, Adopted 1999. Revisions 2001, 2003, 2009, 2017, 2019. Amendment 2005, 2011, 2013, 2015, 2019), including products defined as high oleic acid safflower seed oil, high oleic acid sunflower seed oil, mid oleic acid sunflower seed oil.
- Standard for Named Animal Fats (CXS 211-1999, Adopted 1999. Amendment 2009, 2013 and 2015, 2019).
- Standard for Olive Oils and Olive Pomace Oils (CXS 33-1981, Adopted 1981. Revisions 1989, 2003, 2015, 2017. Amendment 2009, 2013)]
- Standard for Edible Fats and Oils not covered by Individual Standards (CXS 19-1981, Adopted 1981. Revisions 1987, 1999. Amendment 2009, 2013, 2015, 2017, 2019).
- Standard for Fish Oils (CXS 329-2017, Adopted 2017).

IDENTIFICATION OF ANY REQUIREMENT FOR AND AVAILABILITY OF EXPERT SCIENTIFIC ADVICE

None identified.

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

None identified.

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 at CCFO27 (2021).
- Approval of new work by CAC45.
- Consideration at the Draft Provisions at Step 3 by CCFO28.
- Adoption at Step 5/8 by CAC46.

ANNEX

PROPOSED STANDARD FOR SOYA BEAN OIL – HIGH OLEIC ACID (relevant sections of CXS 210-1999 where inclusion is proposed are described below)

1. DESCRIPTION

1.1 Product definitions

Soya bean oil – high oleic acid (high oleic acid soya bean oil; high oleic acid soybean oil) is produced from high oleic acid oil-bearing seeds of varieties derived from soya beans (seeds of *Glycine max* (L.) Merr.).

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 GLC ranges of fatty acid composition (expressed as percentages)

Table 1: Fatty acid composition of high oleic acid soya bean oil (expressed as percentage of total fatty acids)

| | |
|-------|-------------|
| C6:0 | ND |
| C8:0 | ND – 0.14 |
| C10:0 | ND – 0.14 |
| C12:0 | ND – 0.1 |
| C14:0 | ND – 0.5 |
| C16:0 | 2.5 – 8.0 |
| C16:1 | ND – 0.1 |
| C17:0 | ND – 0.8 |
| C17:1 | ND – 1.5 |
| C18:0 | 3.2 – 5.0 |
| C18:1 | 65.0 – 85.0 |
| C18:2 | 1.0 – 10.6 |
| C18:3 | 1.1 – 8.0 |
| C20:0 | ND – 1.0 |
| C20:1 | ND – 1.0 |
| C20:2 | ND – 0.1 |
| C22:0 | ND – 0.7 |
| C22:1 | ND – 0.4 |
| C22:2 | ND |
| C24:0 | ND – 0.5 |
| C24:1 | ND |

ND – not detectable, defined as $\leq 0.05\%$

OTHER QUALITY AND COMPOSITION FACTORS (Appendix to CXS 210-1999)

1. CHEMICAL AND PHYSICAL CHARACTERISTICS

Table 2: Chemical and physical characteristics of high oleic acid soya bean oil

| | |
|---|-----------------|
| Relative density (x° C/water at 20°C) | 0.9092 – 0.9170 |
| Refractive index (ND 40°C) | 1.4623 – 1.468 |
| Saponification value (mg KOH/g oil) | 191.1 |
| Iodine value | 75.0 95.0 |

| | |
|-------------------------------------|----------------|
| Unsaponifiable matter (g/kg) | Max 15% |
|-------------------------------------|----------------|

2. IDENTITY CHARACTERISTICS

Table 3: Levels of desmethylsterols in high oleic acid soya bean oil as a percentage of total sterols

| | |
|------------------------------|--------------------|
| Cholesterol | 0.24 - 0.37 |
| Brassicasterol | 0.20 - 0.34 |
| Campesterol | 19.9 - 23.4 |
| Stigmasterol | 18.4 - 21.4 |
| Beta-sitosterol | 43.1 - 49.2 |
| Delta-5-avenasterol | 1.91 - 2.09 |
| Delta-7-stigmastenol | 2.21 - 2.43 |
| Delta-7-avenasterol | 1.27 - 1.51 |
| Others | 4.51 - 6.04 |
| Total sterols (mg/kg) | 2311 - 2823 |

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

Table 4: Levels of tocopherols and tocotrienols in high oleic acid soya bean oil (mg/kg)

| | |
|--------------------------|-----------------------|
| Alpha-tocopherol | 27.1 - 138.0 |
| Beta-tocopherol | 9.18 - 105.6 |
| Gamma-tocopherol | 89.0 - 1756.4 |
| Delta-tocopherol | 44.3 - 429.4 |
| Alpha-tocotrienol | ND |
| Gamma-tocotrienol | ND |
| Delta-tocotrienol | ND |
| Total (mg/kg) | 949.2 - 1386.7 |

ND – Non-detectable.