



## Agenda Item 12

CX/FO 13/23/13

### JOINT FAO/WHO FOOD STANDARDS PROGRAMME

#### CODEX COMMITTEE ON FATS AND OILS

Twenty-third Session

Langkawi, Malaysia, 25 February – 1 March 2013

#### OTHER BUSINESS AND FUTURE WORK

#### Proposal for New Work to Amend the Codex Standard for Named Vegetable Oils to Include Provisions for High Stearic High Oleic (HSHO) Sunflower Oil

*Prepared by Argentina*

- **PROJECT DOCUMENT**

This project document has been developed according to the Codex Alimentarius Commission (CAC) Procedural Manual, 20th edition (2011), 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 28).

- **PURPOSE AND SCOPE OF THE CODEX STANDARD**

The purpose of this new work is to amend the Codex Standard for Named Vegetable Oils to include HSHO sunflower oil, which, due to its relatively high stearic and oleic acid content, enhances functionality, stability and nutritional properties, particularly in food applications in which liquid oils cannot be used (margarines, butters, fillings, toppings, etc.) The amendment would enable Codex member countries and the food industry to appropriately characterize, name, and market HSHO sunflower oil produced to improve the functional and nutritional benefits of food for consumers and the food industry, and would facilitate the harmonization of rules.

The main benefits of HSHO sunflower oil are:

a) Improved oxidative stability:

- In industrial frying (frozen prefried foods and snacks);
- In sit-down and fast food restaurant frying;
- In the shelf life of packaged foods (snacks, cookies, industrial bread), increasing its length;
- Its taste is neutral and, therefore, does not affect the taste of foods cooked in it.

b) Nutritional improvements<sup>1</sup>: In comparison with conventional sunflower, changes in the fatty acid composition consist of an increase in monounsaturated fatty acids and higher stearic acid considered neutral from the perspective of the increase of LDL and cardiovascular risk. Stearic acid is the only current option to make safe solid fats.<sup>2,3</sup> For this reason, in many fat applications in food requiring solid fats, HSHO sunflower oil is one of the few natural options to substitute trans fats and saturated fats. Indeed, the last report of the

<sup>1</sup> MARTINEZ FORCE, E. and GARCES MANCHEÑO, R. (2004). Nuevos aceites de girasol: el futuro para una industria alimentaria más saludable (New Sunflower Oils: The Future for a Healthier Food Industry). *CTC Alimentación*, **21**, pp. 49-54.

<sup>2</sup> CRUPKIN, M. and ZAMBELLI, A. (June 2008). Detrimental Impact of *Trans* Fats on Human Health: Stearic Acid-Rich Fats as Possible Substitutes. *Comprehensive Reviews in Food Science and Food Safety*, **7**(3), pp. 271-279.

<sup>3</sup> Valenzuela, A., Delplanque, B. and Tavella, M. (April-June 2011). El ácido esteárico: un posible sustituto para los ácidos grasos *trans* de origen industrial (Stearic Acid: a Possible Substitute for Trans Fatty Acids from Industrial Sources). *Grasas y aceites*, **62**(2), pp. 131-138.

FAO-WHO Expert Consultation, in its section titled "Conclusions and recommendations for saturated fatty acids (SFA)", states that: "*Individual saturated fatty acids (SFA) have different effects on the concentration of plasma lipoprotein cholesterol fractions. For example, lauric (C12:0), myristic (C14:0) and palmitic (C16:0) acids increase LDL cholesterol whereas stearic (C18:0) has no effect.*" (*Fats and Fatty Acids in Human Nutrition – Report of an Expert Consultation*. Food and Nutrition Paper, 91, p. 14, 2010, FAO). Similarly, the USDA Dietary Guidelines state that: "*Since stearic acid is not known to raise LDL cholesterol, the DGAC is recommending that stearic acid not be categorized with known "cholesterol-raising fats," which include C12, C14, C16 SFA and trans fatty acids. Foods that are high in stearic acid, such as dark chocolate and shea nut oil, need not be considered as problematic as foods high in other SFA or trans fatty acids.*" (*Dietary Guidelines for Americans*, p. E1-13, 2010, USDA).

c) Improved functionality: The presence of stearic acid allows HSHO sunflower oil or its derived products (oleins and stearins from the fractional crystallization process<sup>4</sup>) to be used in applications requiring solid fats instead of trans fats or other saturated fats, such as margarines, butters for bread products, fillings, confectionery coatings, for bread products, etc.<sup>5</sup>

The scope of the work is totally analogous to that of the other oils defined in Codex Standard 210-1999, particularly oils from other sunflower varieties (*Helianthus annuus*). The main difference in relation to the other varieties lies in the fatty acid composition and related properties, such as the iodine index, refractive index and density.

Therefore, Argentina submits this proposal to establish parameters for HSHO sunflower oil in Codex Standard 210-1999 in order to differentiate its characteristics and composition from those already regulated for sunflower oil. Other specific parameters that could vary in relation to the composition of HSHO sunflower oil will be revised.

- **RELEVANCE AND TIMELINESS**

In the last few years, the trend towards foods of better nutritional quality has increased. In the field of fats and oils, this has been reflected in increasing objections to trans fats from hydrogenated vegetable oils. The need to replace these fats currently recognized only as harmful to health without increasing the level of saturated fatty acids has caused a real revolution in the fats and oils industry and, particularly, in the food industry. At the same time, there is growing consensus on the neutral character of stearic acid as regards the increase of LDL cholesterol and cardiovascular risk. Therefore, there is an increasing need for oils and fats with such functionality, stability and nutritional characteristics that can replace trans as well as saturated fatty acids, which raise cholesterol levels.

For this reason, the industry has been developing different alternatives to the objected fats: many consist in mixing or processing oils which have been included in Codex standards for some time now; others, relatively recent, refer to oils with modified fatty acid composition; and there are new developments not yet included in Codex.

Oils from sunflower seeds with modified fatty acid profiles have become known and are no longer exclusively scientific/technological developments. Today, they are a reality which impact on the agricultural and food industries and the choice of consumers in search for safer food. In this sense, several years ago Codex included high oleic and mid oleic sunflower oils in Codex Standard 210 of Named Vegetable Oils.

HSHO sunflower oil offers the industry the possibility of replacing the use of partially hydrogenated oils in fried snacks, bread products, margarines, toppings and fillings, eliminating *trans* fatty acids and maintaining the same oxidative stability.

HSHO sunflower oil has been approved in the legislation of Spain (Official State Journal No. 317 of 30 December 2010, Sect. I., p. 108823) and Argentina (Argentine Food Code, Chapter VII, Sect. 528 tris) and is in the process of obtaining a GRAS self affirmation document in the United States.

As regards this new oil, it should be mentioned that:

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<sup>4</sup> BOOTELLO, M.A., GARCES MANCHEÑO, R., MARTINEZ FORCE, E. and SALAS, J. (2011). Dry Fractionation and Crystallization Kinetics of High-Oleic High-Stearic Sunflower Oil. *Journal of the American Oil Chemist's Society*, **88**(10), pp. 1511-1519.

<sup>5</sup> DUBINSKY, E. and GARCES MANCHEÑO, R. (2011). High-stearic/high-oleic sunflower oil: A versatile fat for food applications. *International News on Fats, Oils and Related Materials (INFORM)*, **22**, pp. 369-372.

- The modification of fatty acid profiles in high stearic high oleic sunflowers is only due to a change in their proportion and not to the generation of fatty acids absent in conventional sunflowers.
- High stearic high oleic sunflowers have been obtained through classic breeding, molecular marker-assisted selection and analytical techniques which allowed for a more efficient selection of the individuals of interest.<sup>6</sup>
- The scientific procedure followed to accomplish the increase in the stearic proportion of the oil contained in the seed is totally analogous to that used to obtain high and mid oleic sunflower oils.
- As a consequence of the modification of the fatty acid profile, HSHO sunflower oil differs from conventional sunflower oil and high oleic sunflower oil in the values of some physical-chemical parameters, mainly the iodine and refractive indexes and, to a lesser extent, density.
- Stearic acid is a fatty acid commonly present (in different proportions) in all fats and oils, both vegetable and animal, and in numerous products of Codex Alimentarius.
- There are edible natural fats derived from vegetable sources, such as cocoa and other fruit butters used in the chocolate industry, which has a stearic acid content much higher than that of HSHO sunflower oil.

HSHO sunflower oil began to be marketed in 2008 for tests in the food industry, mainly in industrial frying. Those tests showed significant improvements in terms of performance, stability, quality and functionality, and produced food with an organoleptic profile completely acceptable to consumers.

Through the processes of fractional crystallization and chemical or enzymatic interesterification, different types of fats may be obtained for almost all applications in the food industry.

HSHO sunflower oil usage is expected to experience rapid growth over the next several years. Since this oil will be increasingly used due to its favorable characteristics, it is important for it to have consistent naming and specifications to ensure fair trade domestically and internationally. The consideration of the Amendment to the Standard to include HSHO sunflower oil would require little time and would make efficient use of the limited resources of CCFO as the major factor involved is fatty acid composition.

- **MAIN ASPECTS TO BE COVERED**

Based on the Format for Codex Commodity Standards established in the Codex Procedural Manual (p. 50 English version), the proposed standard for the HSHO sunflower oil will include the following aspects:

**Scope**

**Description**

**Essential Composition and Quality Factors**

**Food Additives**

**Contaminants**

**Hygiene**

**Weights and Measures**

**Labeling**

**Methods of Analysis and Sampling**

- **ASSESSMENT AGAINST THE CRITERIA FOR THE ESTABLISHMENT OF WORK PRIORITIES**

This proposal is consistent with the criteria for the establishment of work priorities applicable both to the general issues and to commodities indicated in the Codex Procedural Manual, Section 2, p. 40.

Consumer protection from the point of view of health, food security, ensuring fair practices in food trade,

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<sup>6</sup> Pleite, R., Martínez-Force, E. and Garcés, R. (2006). 54(25):9383-8. Increase of the stearic acid content in high-oleic sunflower (*Helianthus annuus*) seeds. *Journal of Agricultural and Food Chemistry*, **54**(25), pp. 9383-9388. Source: Instituto de la Grasa, CSIC, Seville, Spain.

taking into account the identified needs of developing countries, is guaranteed, as in view of the above, the development of HSHO sunflower oil trade constitutes a healthy alternative to saturated and trans in the food industry and restaurants.

**- Criteria applicable to general subjects:**

***a) Diversification of national legislations and apparent resultant or potential impediments to international trade***

Incorporating this oil into the Codex Alimentarius would contribute to harmonization of national legislations and facilitate marketing internationally, thereby protecting the consumer.

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

None known.

**- Criteria for commodities:**

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

Sunflower oil is the forth most important oil worldwide. Due to its price compared to other edible oils, and also to its nutritional quality, sunflower oil consumption has substantially increased in recent years.

According to data published in the FAO Agribusiness Handbook: Sunflower Crude and Refined Oils, published in 2010, a total of 11,674,000 tons of sunflower oil were produced in 2008/2009. Argentina was the third and fourth highest sunflower oil producer, with 1,785,000 tons, after Ukraine, the Russian Federation and the European Union.

In 2008/2009, Argentina, Ukraine and the Russian Federation represented 56% of world sunflower oil production, and 86% of exports. As regards exports, Argentina accounted for 34% of world sunflower exports (4,000,000 tons were traded internationally in this period) and ranked second.

These data reflect the importance of sunflower oil worldwide and our interest in the consolidation of this important commodity to contribute to food security and nutrition of consumers. This is also an important aspect in the possibility of expansion for modified sunflower oils (in their fatty acid composition), fostering a potential development of these crops as is the case with high oleic sunflower oil, which has contributed significantly at local and regional level to significant substitution of partially hydrogenated oils with high trans fat content in the industry of food and meal preparation.

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

The first commercial batches date from the last four years and are mainly from Argentina, followed by Spain and USA. Based on the success achieved in the application of this oil in the food industry, forecasts for the coming years in these countries and other sunflower producing regions include the following:

Harvest Year	Expected Amount (metric tons)	Expected Cultivated Land (hectares)
2012	2,514	7,788
2013	5,177	15,225
2014	48,526	138,645
2015	135,812	348,235
2016	497,455	1,243,637
2017	1,113,776	2,756,872

***d) Possibilities for the standardization of the product***

Possibilities for the standardization of the product are extremely simple and immediate as the only difference with other sunflowers is the fatty acid composition. This, in turn, change other properties that depend on the same such as iodine index, refractive index and density, on which data is abundant given the accumulated experience of the last few years of trade in this oil.

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

A Codex standard on HSHO sunflower oil would certainly improve consumer protection and prevent deceptive practices and private standard development.

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

Like the rest of the oils covered by the standard Codex Stan 210, the HSHO sunflower oil standard refers exclusively to refined oils. This is especially so with this oil, since it is intended for the processing of packaged food (food industry) and oils used in restaurants and fast food establishments, so it does not apply to raw or semi-processed products.

- **RELEVANCE TO THE CODEX STRATEGIC OBJECTIVES**

The proposed amendment to the Codex standard (CODEX-Stan 210) conforms to the following Codex strategic objectives:

**Objective 1: To promote a sound regulatory framework**

As mentioned above, the inclusion of HSHO sunflower oil in the Codex standard will contribute, from the beginning, to harmonization of the legislations of countries producing and using this new technology, avoiding the proliferation of private, national or regional standards that confuse consumers and restrict international trade unnecessarily.

**Objective 4: To enhance capacity to respond effectively and expeditiously to new issues, concerns and developments in the food sector**

Concerns caused by the verification of the harmful effects of trans fats the 90's led to a massive replacement of these fats with alternative fats, a process that is still in full development at the beginning of this century. Many countries and regions have implemented a wide variety of measures ranging from labelling standards to virtual bans on trans fat use in foods. Adoption of HSHO sunflower oil in Codex would clearly promote a rapid and effective response to the healthy replacement of trans fats and saturated fats.

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

The only Codex standards related to the proposal are as follows:

- Standard for Edible Fats and Oils not Covered by Individual Standards [CODEX STAN 19-1981 (Rev. (2-1999))]
- Standard for Named Vegetable Oils [CODEX STAN 210 (Amended 2003, 2005)], including products defined as high oleic safflower seed oil, high oleic sunflower seed oil, mid oleic sunflower seed oil.

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

None identified.

- **IDENTIFICATION OF ANY NEED FOR TECHNICAL INPUT TO THE STANDARD FROM EXTERNAL BODIES SO THAT THIS CAN BE PLANNED FOR:**

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**

- Document for the proposal for new work, submission to the CCFO (23rd session 2/13)
- Project and new work agreed, approval by CAC at its 36 session (07/13)
- The document at step 3 advances to step 5/8 by 2015 at the 24th session of the CCFO; it is approved as a standard at the 38th session of the CAC (07/15).