CODEX ALIMENTARIUS COMMISSION

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Food and Agriculture Organization of the United Nations

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

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Discussion Paper on the Revision of Limits of Oleic and Linoleic Acids in Sunflowerseed Oils in the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999)

(Report of the electronic working group, Chaired by Argentina and co-chaired by Brazil and assisted by Canada, France, Greece, Hungary, India, Jamaica, Mexico, Netherlands, Nigeria, Poland, Russia, Turkey, United Kingdom, United States of America, and Uruguay and the EU Vegetable Oil and Protein meal Federation (FEDIOL))

Background

1. This proposal was discussed for the first time in 2009 at the 21st Session of the Codex Committee on Fats and Oils (CCFO), when Argentina requested the revision of the limits of oleic and linoleic acids for the categories of sunflower oil covered in the Codex Stan 210-1999, as well as the existing gaps between these parameters in the different categories, and other quality factors related. CCFO21 welcomed the proposal of Argentina to prepare a revised document including all relevant scientific data on sunflower oil related to possible new work, for consideration in the 22nd session.

2. At CCFO22, Argentina submitted a discussion paper on this matter and, considering that some Members noted that the time to examine the proposal was insufficient, CCFO22 agreed to established an electronic working group led by Argentina, which would be in charge of revising the discussion paper submitted for Members' consideration and preparing a draft document for consideration at the CCFO23, taking into account the Guidelines on the Application of the Criteria for the Establishment of Work Priorities Applicable to Commodities and information required by the Committee when proposing the addition of new oils to the Standard for Named Vegetable Oils. The Working Group advanced the clarification of most of the aspects proposed by Argentina, however no agreement was reached on oleic and linoleic values.

3. At CCFO23, Argentina submitted the conclusions of the Working Group. Several countries questioned the proposal to eliminate the gaps between categories for the linoleic and oleic acids, also questioned the lack of a minimum limit for linoleic acid in the traditional category and the modification of parameters in the high oleic category. CCFO23 agreed that: the scope of the document would be revised; the sentence which proposed the elimination of the gaps between fatty acid ranges for the different categories would be deleted; and a new working group to be chaired by Argentina would be created so as to revise the document again.

4. At CCFO24, Argentina, as chair of the eWG, introduced CX/FO 15/24/6 and explained that they had used information from various parts of the world to revise the discussion paper. It was pointed out that a limited number of members had participated in the eWG. It was further explained that scientific studies had shown that climate with high temperatures could affect the oleic acid and linoleic acid contents of traditional varieties of sunflower seed oils and that was the purpose for this revision of CODEX STAN 210-1999.Brazil presented CRD25, which provided additional data and information on increase in production, areas of cultivation of sunflower and on the influence of the climate with high temperatures during seed maturation and fatty acid composition. Although there was a considerable support for the proposal, some delegations argued that the document has been distributed late and requested more time to study the information considering the provisions of the Procedural Manual.

5. CCFO24 agreed to establish another eWG, led by Argentina and co-chaired by Brazil, open to all Members and observers and working in English only, with the following Terms of Reference: “To revise the discussion paper and project document on the basis of the data received with respect to ranges of oleic and linoleic acids values and related quality composition factors in sunflower seed oil for consideration at its next Session”. Moreover, the Committee agreed to ask the Codex Secretariat to issue a Circular Letter to request for information in particular on deviating parameters of sunflower seed oil for consideration by the eWG (CL 2015/05-FO), with the deadline of June1st, 2016.

6. On June 1st , 2015, the Codex Secretariat distributed an invitation to members to participate in the eWG on Discussion Paper and Project Document to revise ranges of oleic and linoleic acids values and related

quality composition factors in sunflowerseed oil. The following members and observers announced their interest: Canada, France, Greece, Hungary, India, Jamaica, Mexico, Netherlands, Nigeria, Poland, Russia, Turkey, United Kingdom, United States and Uruguay and the EU Vegetable Oil and Protein meal Federation (FEDIOL).

7. On September 4th, 2015, a message was sent to all participants of the eWG asking to express their opinion about Argentina´s proposal, including information to support their positions. The proposal was to set the maximum limit of C18:1 (oleic acid) in 50,0 and the minimum limit of C18:2 (linoleic acid) in 40,0. Comments were received from the following members and observers: Brazil, Canada, Hungary, the United States of America (USA), Uruguay and FEDIOL. These values have been proposed by Argentina in the previous eWG and had the consensus of some participant countries.

Comments received

8. No comments were received regarding Discussion Paper sent to the participants. The discussion focused on the ranges of oleic and linoleic acid proposed by Argentina.

9. Argentina presented data collected from north region of the country, related to the percentage ranges of fatty acids in sunflower oil, grown in different locations, in which can be observed the existence of variability in the fatty acids composition of the oil, and that hybrids analysed can express high concentrations of oleic acid. According to the referred data, the concentration of oleic acid in traditional hybrids has varied between 28.2 and 56.4% along the different years of experimentation.

10. Brazil presented data on deviating parameters of sunflower seed oil in relation to ranges of fatty acids values established on Codex Stan 210 that are in line with the proposal of Argentina. Brazil collected data from eight different producers, most of them located in the central west region of Brazil, in a total of 485 results. Based on this data, and considering the approach of mean ±3 standard deviation1, Brazil pointed a higher maximum level for C18:1 (oleic acid) of 55,9 and a lower minimum value for C18:2 of 35,8. Brazil also pointed some minor changes in other fatty acids based on the data collected and in changes in the two proposed ranges.

11. The observer FEDIOL informed that the values of C18:1 and C18:2 of their traditional sunflower seed oil are consistently within the range of the current CODEX standard. Moreover, FEDIOL arguments that in light of European Nutrition tolerances, if Codex would allow 40% of C18:2 as minimum, EU operators would still be below the applied tolerance levels according to EU labelling rules. FEDIOL also stands that with the proposed changes, sunflower oil would be devaluated as cholesterol lowering source of PUFA (C18:2, linoleic). Finally, FEDIOL presented the argument that “if this change is implemented, anyone could grow sunflower seeds, develop new hybrids, plant them in less favourable growing conditions and plea for changes in the standards. For these reasons FEDIOL does not support the proposal of Argentina and Brazil”.

12. Argentina demonstrated that due genetic improvement, new and better forms of agricultural management, new field´s inclusion, yields obtained are so favourable, and even higher than a lot of traditional areas in different countries. Moreover, the argument used by FEDIOL, plays a role against innovation.

13. Hungary, after careful evaluation of the proposed values, the reasoning behind them, and the data available in the country, argued that they are big producers of this type of oil and considering data from 2005-2015 on traditional sunflower oil seed, although with differences in climate conditions, the values of oleic and linoleic acid fit the current standard ranges. Considering this data, Hungary does not consider that there is an urgent need to change current oleic and linoleic ranges because even when the weather was exceptionally hot and sunny, the fatty acid composition of their sunflower seed oil did not show extreme changes. In addition, they understand that it is important to keep significant difference between the traditional and the mid or high oleic sunflower seed oils because these kinds of oils have distinct uses and different economic values.

14. USA considered that the proposed changes in current oleic and linoleic acids ranges would impact and require additional changes to oleic acid and linoleic acid composition for mid oleic sunflower seed oil, which represents 80-90% of produced sunflower seed oil in USA. For this reason, they don’t support the proposed revision by Argentina and Brazil.

15. Canada recognized that there is scientific evidence showing that sunflower seed oil produced in certain geographical area of Argentina and Brazil, which is close to the Equator (higher temperatures), does not meet the current linoleic and oleic acid ranges. However, the proposal to expand the limits of the fatty acid ranges of traditional sunflower seed oil would cause an overlap between the oleic acid limits of traditional oil with mid oleic oil and the linoleic acid limits of traditional oil with high oleic oil. Instead of revising the limits of the fatty acid ranges for sunflower oil in the existing standard, Canada proposed a different approach. Recalling that

[1] This approach has been adopted by CCFO to amend the level of desmethylsterols and fatty acid composition of rice bran oil in Codex Standard for Named Vegetable Oils (CODEX STAN 210-1999) - REP13/FO, paragraphs 86-89, available at Codex Website, link: http://www.fao.org/fao-who-codexalimentarius/meetings-reports/en/?y=2013.

the statement at the beginning of section 3.1 of the CODEX STAN 210-1999 recognizes that there could be variations in the essential compositional and quality factors of vegetable oils, due to national geographical or climatic factors, Canada proposes to introduce a footnote to indicate the different fatty acid profile of traditional sunflower oils from the equatorial region instead of revising the limits of the fatty acid ranges for sunflower oil in the existing standard. FEDIOL did not support the Canadian proposal.

16. Uruguay submitted comments and, according to the data obtained in the country, proposed a higher maximum level for oleic acid of 54,9 and a lower minimum value for linoleic acid of 35,1. FEDIOL did not support the Uruguayan proposal.

17. France submitted comments and said that the overlapping of the fatty acids values does not seem to be justified enough, and the weather conditions are not sufficient to explain the values and variations proposed by Argentina and Brazil in their new proposal. France fears that such proposal could lead to a problem of identification of the oils, by encouraging fraud or risking a mix of the seeds. The sunflower seeds available on the French market fits in the current Codex values.

18. In summary, the comments were:

- There is scientific evidence and data presented by Argentina, Brazil and Uruguay, which proves that temperature influences the fatty acid ranges of sunflower oil, specially oleic and linoleic acids, produced from sunflower seed grown in new production areas warmer than the traditional ones;
- The proposal of change in the ranges of linoleic acid will have negative impact on nutritional labeling;
- Some producers did not notify problems related to the ranges in sunflower oil;
- The overlapping of ranges raises concerns related to sunflower oil identity and authenticity;
- The proposed ranges would impact and require additional changes to oleic and linoleic acid composition for mid oleic sunflower seed oil;
- The current standard (CODEX STAN 210-1999) recognizes that there could be variations in the essential compositional and quality factors of vegetable oils, due to national geographical or climatic factors, there is the possibility to include a footnote in the current standard, instead of changing the current ranges.

Recommendations and conclusion

19. Considering that:

- There is scientific evidence and data presented by Argentina, Brazil and Uruguay, which proves that temperature influences the fatty acid ranges of sunflower oil, specially oleic and linoleic acids, produced from sunflower seed grown in new production areas warmer than the traditional ones;
- The statement at the beginning of section 3.1 of the CODEX STAN 210-1999 recognizes that there could be variations in the essential compositional and quality factors of vegetable oils, due to national geographical or climatic factors;
- This proposal is in line with strategic goal 1 of the Strategic Plan 2014-2019 of the Commission, which defines that Committees are responsible for the establishment of international food standards that address current and emerging food issues, by revision of international standards as needed, in response to needs identified by Members (activity 1.2.2);
- Argentina is an important producer of sunflower oil and an increasing percentage of Argentinean sunflower oil from traditional seeds has naturally high values of oleic and linoleic acids what results in ranges that do not fit current ranges of the standard what may cause restrictions to international trade;
- Similar situations were recently discussed in CCFO regarding revision of the standards of olive oil standard and peanut oil due to climatic influence or new varieties not covered by current standards and the new works were approved;
- Despite the scientific evidences and data presented, the revision of the ranges was addressed in three working groups and it was not possible to reach a consensus;

The Chair and Co-Chair of the eWG recommend the Committee to consider the approval of the new work to revise the ranges of oleic and linoleic acids based on the reasons above. The overlapping of ranges or not and other alternative solutions, which includes the possibility of a footnote, as suggested by Canada, should be considered as options during the new work development.

20. A draft project document that summarizes the data and justification is presented in (Appendix 1). Similarly the proposed revision to limits of Oleic and Linoleic Acids in sunflowerseed Oil in the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) is presented in (Appendix II) for consideration by CCFO25

APPENDIX I

DRAFT PROJECT DOCUMENT

PROPOSED NEW WORK TO AMEND THE CODEX STANDARD FOR NAMED VEGETABLE OILS (CODEX STAN 210-1999): ESSENTIAL COMPOSITION OF SUNFLOWER OIL

1. Purpose and scope of the standard

The proposed work is intended to amend the Codex Standard for Named Vegetable Oils (CODEX STAN 210-1999) in relation to sunflower oil so as to adapt composition parameters - particularly, the limits for oleic acid (C18:1) and linoleic acid (C18:2) - to represent the actual world variability of this oil.

2. Relevance and timeliness:

Oils derived from sunflower seeds are some of the most consumed oil products worldwide for decades, both for its taste and for its beneficial nutritional qualities, and its functionality in the food industry.

The top sunflower producers includes Russia, Ukraine and other temperate countries (77% of world's production), but the cultivation of sunflower seeds in subtropical and tropical countries currently represents 15% of world sunflower production according to FAOSTAT data from 2011, 2012 and 2013.

The increase of sunflower cultivation to mild climate territories of Argentina, Tanzania, South Africa, India, Myanmar, Uganda, Bolivia, Brazil and Paraguay[2], as well as the expansion of its cultivation to Kenya, Angola, Mozambique, Zambia[3] may represent a standpoint to discuss the revision of the limits of some fatty acid composition profiles of sunflower oil, so the adjustment of such provisions should envision the worldwide variability of sunflower oils currently traded.

There is evidence in scientific literature of the influence of the temperature during seed maturation and fatty acid composition[4,5,6,7].

In order to ensure a regional and/or international trade that is fair, dynamic and transparent, it is essential that Codex consider amending the parameters related to the content of oleic and linoleic fatty acids, with a view to providing a framework for them within the standard.

3. Main aspects to be covered:

The revision of the parameters of oleic and linoleic acids in sunflower oil included in section Essential Composition and Quality Factors - Table 1: Fatty acid composition of vegetable oils as determined by gas liquid chromatography from authentic samples (expressed as percentage of total fatty acids) (see Section 3.1 of the Standard), and related quality composition factors in sunflowerseed oil.

4. Assessment against the Criteria for the establishment of work priorities:

This proposal for new work is consistent with the following criteria applicable to commodities:

a) Consumer protection from the point of view of health, food safety, ensuring fair practices in the food trade and taking into account the identified needs of developing countries.

The composition limits set in the Codex Standard have been mainly established to ensure fair practices in the food trade. However, non-representative limits may also act as technical barriers to trade in genuine sunflower oils, particularly sunflower oil from traditional seeds, if these exceed the limits for agroclimatic reasons or other causes related to the hybrids used. These limits are not safety-related.

b) Volume of production and consumption in individual countries and volume and pattern of trade between countries.

Sunflower oil is the fourth most important oil in the world. Due to its price as compared to other edible oils, its consumption has increased significantly in the last few years.

According to the most current data published by the FAOSTAT (www.faostat.fao.org), an average of 13,713,410.5 tons of sunflower oil was produced in the 2012 and 2013 crops. The top five producers are

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[2]FAOSTAT, 2012.

[3]Protabase Records - Helianthus annuus L.(at. http://database.prota.org/PROTAhtml/Helianthus%20annuus_En.htm)

[4]Grunvald AK et al. Influence of Temperature on the Fatty Acid Composition of the Oil from Sunflower Genotypes Grown in Tropical Regions. Journal of the American Oil Chemists' Society, 90(4):545-553, 2013.

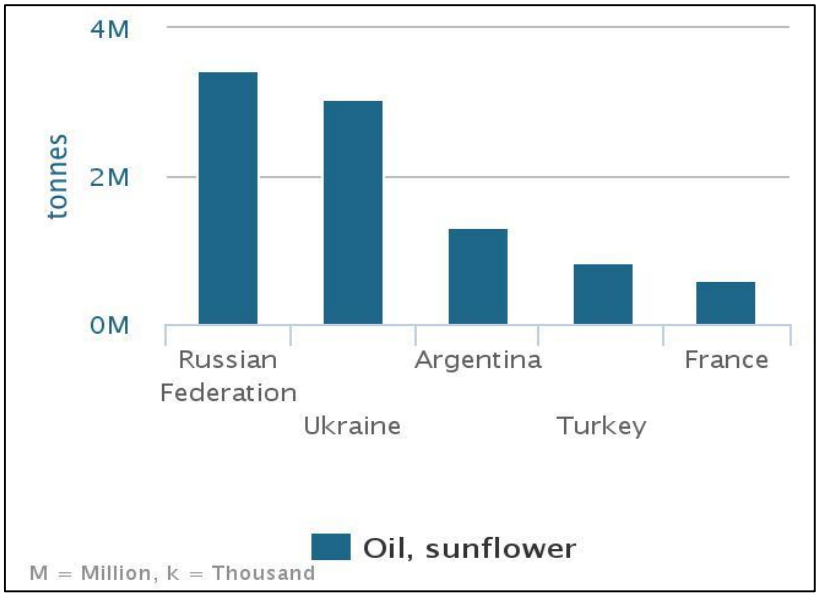
[5] Lajara JR, Diaz U, Quidiello RD. Definite influence of location and climatic conditions on the fatty acid composition of sunflower seed oil. Journal of the American Oil Chemists' Society 67(10):618-623, 1990.

[6]Salera E, Baldini M. Performance of high and low oleic acid hybrids of sunflower under different environmental conditions. *Helia* 21(28):55-68, 1998.

[7]Sukkasem C, Laosuwan P, Wonprasaid S, Machikowa T. Effects of environmental conditions on oleic acid of sunflower seeds. International Journal of Chemical, Environmental & Biological Sciences 1(2):4087, 2013.

Russian Federation, Ukraine, Argentina, Turkey and France, which represented in this period 67% of world sunflower oil production (Figure 1).

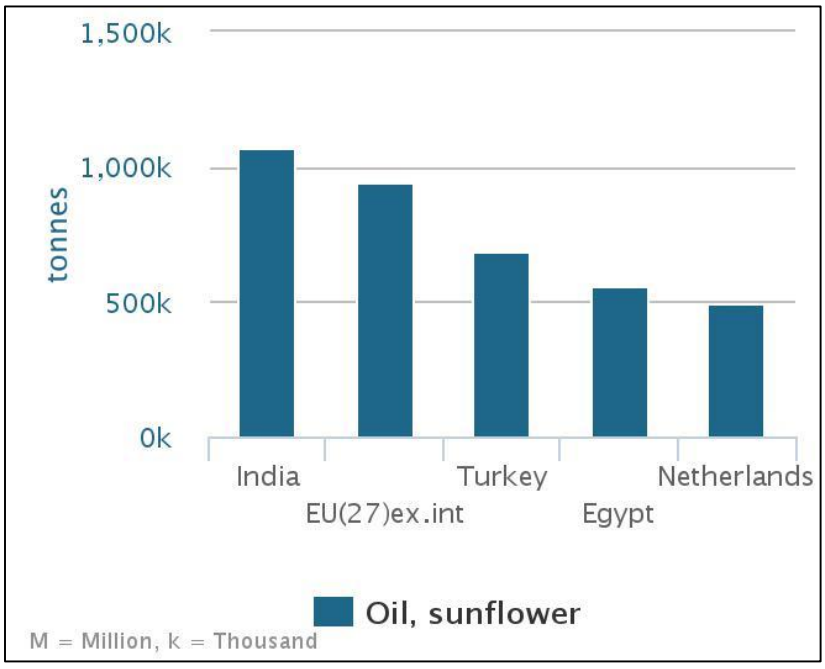
Figure 1. Sunflower oil production of top 5 producers (average 2012/2013).



In 2012/2013, the main exporters were Ukraine, the Russian Federation, Argentina, Netherlands and Hungary. Practically, all production of sunflowerseed oil in Ukraine was destined to exportation, while 41% of the oil produced in the Russian Federation and 46% in Argentina were exported. Ukraine, Russian Federation and Argentina were responsible for 25, 10 and 4%, respectively, by exports considering the global production in this period.

As regards to imports, India, European Union (except intra trade), Turkey, Egypt and Netherlands were the top five importers of sunflowerseed oil in 2012 and 2013 (Figure 2). They imported together in this period a total of 3,753,634 tons of sunflower oil.

Figure 2. Sunflower oil imports of top 5 importers (average 2012 – 2013).



c) Diversification of national legislations and apparent resultant or potential impediments to International trade.

This Codex Standard may be used by Member States as a reference for the establishment of their own national legislation.

The WTO Agreement on Technical Barriers to Trade states that, whenever a Member adopts a technical regulation in accordance with relevant international standards, it shall be presumed not to create an unnecessary obstacle to international trade (Article 2.5.) There is sound scientific evidence of the world variation in the oleic/linoleic acid levels and related indexes as a consequence of high temperatures in production areas. In 2006, the Instituto Argentino de Normalización y Certificación (IRAM), the Argentine standardization body which represents Argentina before ISO, revised the sunflower standard based on the results of the ASAGA study attached.[8]

Finally, it should be stressed that the legislation on sunflower oil in the Argentine Food Code has been modified to adapt it to the productive reality, since the Codex Standard no longer allows reflecting the fatty acid profile of sunflower oils from Argentina traditional seeds.

The proposed amendment to the Codex Standard for Named Vegetable Oils (CODEX STAN 210) will help to provide a harmonized international approach to the said quality and composition factors and will facilitate sunflower oil world trade for all the producers.

The resolution of the various inconsistencies found for sunflower oils defined in Codex Stan 210, will avoid difficulties in and barriers to trade.

d) International or regional market potential.

The consumption of edible vegetable oils has risen significantly in the last few years, and this trend is expected to continue and increase in the future.

Sunflower oil production is forecast to reach an all-time high of 16.6 million tons 1.4 million on the year. Exports are projected to surge, with Ukraine and Russia accounting for the bulk of the increase. Global consumption is forecast to grow 4 percent, driven mainly by strong demand in the EU, India, the Middle East and North Africa.

d) Amenability of the commodity to standardization.

This commodity is already regulated by CODEX STAN 210 in force since 1999. However, due to the appearance of new sunflower hybrids and production under new agro climatic conditions, differences in composition parameters mainly based on production areas with wider temperature variation and high temperatures are becoming increasingly evident.

The proposed changes should be introduced in the standard as there are scientific studies and analytical data supporting the rationale for amendment of Codex Stan 210.

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

The Codex Standard in force does not address the natural variation in the fatty acid composition of sunflower oil according to agroclimatic conditions of production areas worldwide.

Therefore, the amendment to the Codex Standard will contribute to ensure fair practices in the trade in these oils.

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

Not applicable.

g) Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental bodies.

None known.

5. Relevance to the Codex strategic objectives:

The proposed new work would contribute to guaranteeing the proper identification of sunflower oil in international trade, taking into account the special needs and concerns of all countries, as it will meet the following strategic goals of the Strategic Plan2014-2019 of the Codex Alimentarius.

Goal 1: Establish international food standards that address current and emerging food issues.

The elaboration of Codex standards that are more representative of the world conditions will help to ensure their wider adoption by Member States and reduce to a minimum their possibility of causing negative effects on international trade as it is guaranteed that they do not represent any technical barriers to trade. This activity is very

[8] - http://www.alimentosargentinos.gob.ar/HomeAlimentos/Aceites%20y%20Oleaginosas/documentos/011.pdf

important considering the efforts being made by the international community to increase the production of food in order to guarantee food security, for which new regions that used to be unproductive have been incorporated into the productive system over the years.

Historically, sunflower seed is being produced in temperate countries. The identity and quality factors of Codex Standard were defined based on data from these countries. The increasing of sunflower seed production in new regions, with higher temperature, has resulted in oil with different fatty acid profiles, which does not fill the parameters established, making outdated the current in Codex Standard.

According to objective 1.2 of the strategic goal 1, it is expected that international standards could be developed and revised in order to reach the needs of its Members in response to factors that affect food safety, nutrition and fair practices in the food trade. Unfortunately, this issue has been discussing in Committee since 2009 without a decision about the matter.

Goal 2: Ensure the application of risk analysis principles in the development of Codex standards

The proposed work will promote the elaboration of Codex commodity standards based on the rigorous scientific analysis of collected data.

The proposed amendment to this Codex Standard (CODEX STAN 210) will promote fair trade of sunflower oil, as the production conditions in other geographic areas with parameters different from those regulated by Codex are considered thus reflecting the existing world variations. Also, this will prevent genuine oils from being classified under undefined areas.

This proposal of new work is aligned with the objective 2.3 of the strategic goal 2 that recommend increasing scientific input from developing countries. Argentina and Brazil present their analytical results from genuine oil of traditional sunflower seeds showing that the fatty acid profile, mainly oleic and linoleic acid, are out of current codex standard. There are scientific evidences that explain the influence of temperature in the fatty acid profile.

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

There are not others ongoing works about sunflower oil. However, similar new works were recently approved by CCFO regarding revision on standards of olive oil standard and peanut oil due to climatic influence or new varieties not covered by current standards.

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

None identified.

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

None identified.

9. Proposed time-line for completion of the new work:

Timetable	Meeting	Progress
March 2017	CCFO25	Agree on purpose and scope and request approval for new work from the CAC at its 34th session.
July 2017	CAC40	Approval of new work.
August 2017/July 2018	Intersession electronic working group	Development of a draft to amend the sunflower oil standard and circulation for comments by the Codex secretariat at Step 3 in view of the 26th CCFO session (2019).
February 2019	CCFO26n	Discussion of the draft to amend the sunflower oil standard at step 4 and proposal to forward the draft to CAC for adoption at step 5/8.
July 2019	CAC42	Final adoption of the draft amendment for sunflower oil standard at step 5/8.

Appendix II

Draft proposed revision of limits of Oleic and Linoleic Acids in Sunflowerseed Oils in the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999)

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. Supplementary criteria, for example national geographical and/or climatic variations, may be considered, as necessary, to confirm that a sample is in compliance with the Standard.

Fatty acid	Current standard of Sunflower-seed oil	Proposal
C18:1	14,0 – 39,4	14,0 – [to be defined] [1]
C18:2	48,3 – 74,0	[to be defined] – 74,0 [1]

[1 Ranges of oleic acid (C18:1) of 14.0 - 50.0 can be accepted for traditional oil produced in warmer areas].

[2 Ranges of linoleic acids (C18:2) from 40.0 – 74.0 can be accepted for traditional oil produced in warmer areas].

Related indexes (refractive index, saponification value, iodine value and relative density) would be determined stoichiometrically once the new limits are defined.