codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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Agenda Item 4 **CX/FO 01/4**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON FATS AND OILS
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PROPOSED DRAFT AMENDMENT TO THE STANDARD FOR NAMED VEGETABLE OILS (INCLUDING PROVISIONS FOR HIGH OLEIC ACID SAFFLOWER OIL AND HIGH OLEIC ACID SUNFLOWER OIL) GOVERNMENT COMMENTS AT STEP 3

The following comments have been received from Canada, Italy, Poland, South Africa, Spain, the United Kingdom and the United States of America in response to CL 2000/25-FO and CL 2000/25A-FO.

CANADA

In principle, Canada would not object to the inclusion of the high oleic acid safflower oil and the high oleic acid sunflower oil in the *Codex Standard for Named Vegetable Oils*. These oils are suitable for frying applications because of their high content of oleic acid and virtual absence of highly oxidizable polyunsaturated fatty acids. Additionally, these oils are low in saturated fat and contain no *trans* fatty acids, therefore they would be considered as healthy oils. We would note however, that there would need to be a mechanism to allow consumers to differentiate between the traditional "high polyunsaturated oils" (i.e., low oleic acid oils) and the "high oleic acid" oils. We do not believe the addition of "high oleic" to the name, without some form of qualifying information, would be sufficient as it would hold little meaning for most consumers. One possibility could be the addition of text on the label to illustrate the recommended use of the oil as well as a declaration of the nutrient content in accordance with the Codex *Guidelines for the Use of Nutrition Claims*. For example, the high polyunsaturated oils could have text such as, *"Not suitable for frying"*, or *"Recommended for use in salad dressings"* (or both and thus convey an entire educational message).

These proposals from France and Japan are illustrative of the current trend to develop new oils with non-traditional fatty acid profiles. With the potential number of "new" oils that could be developed with modified saturated, oleic or linolenic acid content, the Codex Committee on Fats and Oils could find itself in the position of constantly having to create a new definition for each modified oil. Given the current structure of the Standard, each of these new oils would need to be reviewed and added to Section 2 with corresponding amendments to Section 7 (if appropriate) and, as a minimum, Tables 1 and 2.

One possible solution could be to adopt a more generic approach and name the oil in a manner which would incorporate the traditional plant name attributable to an oil from a particular species, but the fatty acid modification would be dealt with via labelling. This, however, raises concerns about what terminology could be used and how could it be linked to instructions for use, recognizing that not all monounsaturated fatty acids are equivalent in terms of nutritional value or biochemical activity.

High oleic acid safflower oil

The data supplied by Japan does not indicate the number of samples analysed to produce their information. Additional information is required with respect to whether or not there were any variations due to geographical location or growing conditions. Would the fatty acid profile provided reflect the fatty acid profile of high oleic acid safflower oil produced from safflower grown in other countries?

High oleic acid sunflower oil

Similarly, Canada would like additional information on the data supplied by France. Is the data indicative of variations in geographical location or growing conditions? Additionally, would the fatty acid profile provided reflect the fatty acid profile of high oleic acid sunflower oil produced from sunflower grown in other countries?

Amendment of provisions for coconut oil

It is noted that the fatty acid profile provided by the Phillippines provides the average profile ± standard deviation. Although it is noted that the average value falls within the fatty acid range specified for Coconut Oil in Table 1 of the *Codex Standard for Named Vegetable Oils*, what is required from the Phillippines is the number of samples analysed and the range of values they obtained.

The cholesterol values given for coconut oil are in mg/kg. The levels of the other sterols and total sterols are not given. Table 3 of the *Codex Standard for Named Vegetable Oils* provides data in terms of % of total sterols and all the individual sterols values are provided. Therefore it is difficult to compare the Philippines values with the current Codex values. We would suggest therefore that the Philippines supply additional data indicating the complete sterol profile, including the total content of sterol as mg/kg of oil.

Additional general comments:

Canada notes that there is data missing relative to desmethylsterols, levels of tocopherols and tocotrienols for the following oils:

palm olein
palm stearin
rapeseed oil (high erucic acid)
Mustard oil

These oils are identified in Table 2 and hence their data should be included in Table 3.

Canada is of the view that there needs to be consistency between Table 3 and Table 4 in the presentation of the data. Table 3 expresses the desmethylsterols as a % of the total sterols and provides the total sterol content in terms of mg/kg of oil. Table 4, however, presents the data in terms of mg/kg of oil and mg/kg of total tocopherols and tocotrienols in oil. Canada suggests the data in Table 4 should be presented in the same manner as the data in Table 3, namely, the tocopherols and tocotrienols be presented as % of the total tocopherols and tocotrienols and the total be presented as mg/kg of oil.

ITALY

Comments from Italy on CL 2000/25-FO – Proposed Draft Amendment to the Standard for Named Vegetable Oils

Amendment proposed by the Italian delegation to the Standard for Named Vegetable Oils to CL 2000/25-FO (August 2000) – Annex 2

Appendix page 15

1.4 Soap content 0.001% as sodium oleate

Amendment proposed by Italy delegation to the Standard for Named Vegetable Oils to CL 2000/25A-FO – Addendum to CL 2000/25-FO

Page 2

Sufflowerseed oil (high oleic acid)

Beta-sitosterol	42.6 – 54.9
Delta-5-avenasterol	3.9 – 8.9
Delta-7-avenasterol	ND-4.1

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)

See Annex to CX/FO 01/4.

Table 3: Levels of desmethylsterols in crude vegetable oils from authentic samples as a percentage of total sterols (see Appendix 1 of the Standard)

See Annex CX/FO 01/4.

POLAND

Section 4.2 – Flavours

We do not use aromatic oils.

Section 4.3 – Antioxidants

We do use 319, 321, 389 to produce snacks, chips and frying oils used in catering business. We do not use 384 in oils.

Section 4.5 – Anti-foaming agents

900a can be used only for frying fats.

Section 5.1 – Heavy metals

We think that it is necessary to set limits for Cd and Hg:

Cd – no more than 0.01 mg/kg
Hg – no more than 0.01 mg/kg

SOUTH AFRICA

para 2.1: Product definition

It should be made very clear that the product is prepared from varieties of sunflower and not by means of genetic modification.

para 3.1: Fatty acid composition (under "Note" on p5)

We propose that the upper limit for linoleic acid in HOSO should be 12%. This must also be added to para 3.4 (p10) .

para 4: Table 4 - Alpha-tocopherol content

Sunflower oil is the top oil in respect of Alpha-tocopherol (100% vitamin E activity). We recommend a minimum alpha-tocopherol content of 700mg/kg. This will also enhance oil stability, one of the main purposes of HOSO.

SPAIN

Section 2 - Description

In sections 2.1.13 “Colza oil with a low erucic acid content”, 2.1.15 “Safflower oil with a high oleic acid content” and 2.1.19 “Sunflower oil with a high oleic acid content” should indicate, where appropriate, whether the seeds come from genetically modified plants.

Section 4 - Food additives

Section 4.2 Flavourings should be deleted as they are not considered necessary.

The maximum dose authorised for additive 319 tert butylhydroquinone should be reduced as the maximum authorised level (120 mg/kg) is considered too high in terms of the RDI established by JECFA (0-0.3 mg/kg of weight).

The maximum dose authorised for additive 389 dilauryl thiodipropionate should be reduced as it is considered that the maximum authorised level (200 mg/kg) is considered too high in terms of the RDI established by JECFA (0-0.3 mg./kg weight).

Monoglyceride citrate has no “SIN” number assigned and must not be shown under the same number as isopropyl citrate.

Section 7 – Labelling

A paragraph with the following text should be added:

“The labelling should state whether the oils come from genetically modified seeds”.

Table 1 – fatty acid ranges

In table 1: Ranges of composition of fatty acids of unrefined vegetable oils, determined by LGC on authentic samples, it is proposed the level be substituted for fatty acid C22:0 in the column corresponding to sunflower oil with a high oleic acid content, from “0.5-1.1” by “0.5-1.5” due to the fact that the analyses carried out in Spain on national and imported samples show that the figure of 1.1% is exceeded on many occasions.

Appendix

The following limits are proposed for demethylsterols in table 3.

	Sunflower oil	Sunflower oil with a high oleic acid content
Campesterol	6.5 - 12.9	5.0 - 12
Stigmasterol	6 - 12.5	4.5 - 12.5
Betasitosterol	55 - 70	42 - 70

UNITED KINGDOM

Table 1: Fatty acid composition

The fatty acid specifications must reflect the natural variations found in oils from all areas which produce them commercially. Data obtained in the UK indicates that some of the proposed ranges for the high oleic oils are too limited and suggests they are extended as shown below.

High oleic safflower oil		High oleic sunflower oil	
C17:0:	ND – 0.1	C16:0:	2.6 – 4.8
C17:1:	ND – 0.1	C18:0:	2.9 – 6.2
C18:0:	1.5 – 2.4	C18:1:	75 – 90.7
C22:0:	ND – 0.4	C18:2:	2.1 – 17
		C22:0:	0.5 – 1.6

The proposed changes are based on data from oils of known authenticity (five samples of high oleic safflower oil and eight of high oleic sunflower oil) and using internationally recognised analytical methods. The original data is published in: Authenticity of edible vegetable oils and fats, Part XXIV: high-oleic oil samples (*Leatherhead Food RA Research Report* No **743**, Leatherhead Food RA, 1995).

Table 2: Chemical and physical characteristics

On the basis of the UK fatty acid data for high oleic sunflower oil, it is suggested that the range for iodine value is amended to '78 - 90'.

UNITED STATES OF AMERICA

Comments on the Proposed Standard for High Oleic Sunflower Oil

It would appear that the French proposal for high oleic acid sunflower oil is satisfactory for amending the Standards for Named Vegetable Oils. The United States recommends that the current Standards for Sunflower Oil be broadened to include oils that have more oleic acid that the current Standards allows, but less than would qualify to be called high oleic sunflower oil under the French proposal.

The United States recommends the following for expanding the range of oleic and linoleic acid:

Oleic acid range - 14 - < 75
Linoleic acid range - 15 - 74

Expanding these ranges in the Codex definition for sunflower oil is consistent with other sources such as the internationally respected Bailey's Industrial Oil and Fat Products (Fifth Edition, Volume 2). This publication states that oleic and linoleic acid can vary significantly in sunflower oil depending on weather conditions during the growing seasons as well as the latitudes in which it is grown. It is well known that sunflower grown above the 39th latitude will have a higher level of linoleic acid and a lower level of oleic acid.

The precedent for a wide range in fatty acid composition has been established in the Codex Standard for rapeseed oil having an oleic acid range from 8.0 to 60.0.

In the United States of America, a variety of sunflower oil currently being marketed contains approximately 65% oleic acid and 25% linoleic acid. Under the current Standard, this variety would fall outside the range for oleic acid (14.0 -39.4) and linoleic acid (48.3 - 74.0). It would not, however, meet the Standard proposed for high oleic sunflower oil either. Thus if the Standard is not modified to cover this variety, we have the anomaly of a variety with improved properties over the traditional varieties that does not meet the Standard.

The new variety described above is expected to replace in due time, the traditional varieties in the United States. This variety oil will be labeled and sold as sunflower oil in the United States. This variety was introduced to meet market needs in the snack-food food processing and food service industries. These industries require a frying oil having good heat, oxidative and flavor stability without the oil having to be hydrogenated.

The new variety is derived from the traditional *Helianthus annus* L., a native North American plant. It is one of 67 species of the genus Helianthus and was developed using traditional breeding methods. Additional fatty acid composition of the new variety follows:

C16:0	Palmitic	2.0 - 5.0
C18:0	Stearic	1.0 - 5.0
C18:3	Linolenic	Less than 0.5
C20:0	Arachidic	Less than 0.5
C20:2	Eicosadienoic	Less than 0.5
C22:0	Behenic	0.6 - 1.5
C22:1	Erucic	Trace
C24:0	Lignoceric	Less than 0.5

Therefore, we propose the following fatty acid composition for sunflower oil:

C6:0	ND
C8:0	ND
CI0:0	ND
C12: 0	ND - 0.1
C14: 0	ND - 0.2
C16: 0	2.0 - 7.6
C16:1	ND - 0.3
C17:0	ND - 0.2
C17:1	ND - 0.1
C18:0	1.0 - 6.5
C18:1	14.0 - <75.0
C18:2	15.0 - 74.0
C18:3	ND - 0.5
C20:0	0.1 - 0.5
C20:1	ND - 0.3
C20:2	0.3 - 1.5
C22:0	0.3 - 1.5
C22:1	ND - 0.3
C22:2	ND - 0.3
C24:0	ND - 0.5
C24.1	ND

<u>Comments on the Proposed Standard for High Oleic Safflower Oil</u>

Based upon the fatty acid composition for edible oils currently being marketed in the U.S., the U.S. recommends the following ranges for high oleic safflower oil:

Fatty Acid	% Total Fatty Acids
C12:0	Less than 0.2
C17:0	ND - 0.1
C17:1	ND - 0.1
C18:1	>70
C18:2	≤19.9

ANNEX

ITALY

Table 1: Fatty acid composition of vegetable oils as determined by gas liquid chromatography from authentic samples (espressed as percentage of total fatty acids) (see Section 3.1 of the Standard)

Fatty acid	Arachis oil	Coconut oil	Grapeseed oil	Maize oil	Palm oil	Palm olein	Rapeseed oil
C6:0		ND-0,7					
C12:0			ND	ND-0,1			
C14:0				ND-0,1			
C16:0				8,6-13,0		32,0-43,5	
C16:1			0,2-1,2				
C18:0				1,5-3,3		3,0-5,0	
C18:1	35.0-69,0					38,0-48,0	
C18:2	12,0-43,0				8,5-12,0	9,5-15,0	
C18:3	ND-0,2	ND-0,1		0,5-1,1			
C20:0		ND-0,2					0,5-1,0
C22:0				ND-0,2			
C22:1				ND			
C24:0			ND-0,4	ND-0,3			

Fatty acid	Rapeseed oil (low erucic acid)	Safflowerseed oil	Safflowerseed oil (high oleic acid)	Sesameseed oil	Soyabean oil	Sunflowerseed oil	Sunflowerseed oil (high oleic acid)
C16:0				7,9-12,0			3,0-5,0
C18:1					17,0-30,0		70,0-85,0
C18:2	15,0-25,0				48,0-59,0		3,0-20,0
C18:3			ND-0,5		4,5-11,0		
C20:1	0,5-2,5				0,2-0,5		0,1-0,3
C20:2							
C22:0		ND-0,5			0,2-0,7		0,5-1,5
C22:1		ND-0,3			ND	ND-0,1	

Table 3: Levels of desmethylsterols in crude vegetable oils from authentic samples as a percentage of total sterols (see Appendix 1 of the Standard)

	Arachis oil	Coconut oil	Grapeseed oil	Maize oil	Palm oil	Palm kernel oil	Rapeseed oil (low erucic acid)
Cholesterol	ND-1,0	ND-1,0	ND-0,5				ND-0,8
Brassicasterol			ND-0,2	ND-0,1			
Campesterol		6,0-11,2	7,5-14,0	16,0-24,1			
Stigmasterol			7,5-12,0	4,3-8,0			0,2-1,0
Beta-sitosterol	47,4-69,0		64,0-70,0				
Delta-5-avenasterol	5,0-18,8		1,0-3,5	1,5-5,0		1,4-5,0	2,5-6,6
Delta-7-stigmastenol	ND-1,0		0,5-3,5	0,2-1,0	0,2-1,0	ND-1,0	ND-0,5
Delta-7-avenasterol	ND-1,5		0,5-1,5	0,3-1,2	ND-0,5		
Others			ND-5,1				
Total sterols (mg/kg)			2000-7000	7000-22100			4500-11300

	Safflowerseed oil	Safflowerseed oil (high oleic acid)	Sesaseed oil	Soyabean oil	Sunflowerseed oil	Sunflowerseed oil (high oleic acid)
Cholesterol	ND-0,3		0,1-0,5	0,2-0,8	ND-0,5	
Brassicasterol		ND-0,4				ND-0,2
Campesterol		9,3-15,0			7,0-13,0	7,0-13,0
Stigmasterol		5,0-7,3	5,0-12,0		6,0-13,0	6,0-13,0
Beta-sitosterol				47,0-60,0	50,0-65,0	42,0-65,0
Delta-5-avenasterol				1,5-3,7	1,5-6,9	1,5-6,9
Delta-7-stigmastenol		8,5-13,7	0,5-2,5		6,5-24,0	6,5-24,0
Delta-7-avenasterol				1,0-3,0	3,0-7,5	3,0-7,5
Others		4,4-6,4				
Total sterols (mg/kg)		2000-3000		1800-4500	2400-5000	