

# codex alimentarius commission



FOOD AND AGRICULTURE  
ORGANIZATION  
OF THE UNITED NATIONS

WORLD  
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ORGANIZATION



JOINT OFFICE: Viale delle Terme di Caracalla 00100 ROME Tel: 39 06 57051 www.codexalimentarius.net Email: codex@fao.org Facsimile: 39 06 5705 4593

Agenda Item 5

CX/FO 05/19/5

**JOINT FAO/WHO FOOD STANDARDS PROGRAMME  
CODEX COMMITTEE ON FATS AND OILS  
Nineteenth Session  
London, United Kingdom, 21– 25 February 2005**

**PROPOSED DRAFT AMENDMENTS TO THE STANDARD FOR NAMED VEGETABLE OILS**

**Governments and international organizations wishing to submit comments to the Annexes to this document should do so in writing (preferably by electronic file) to the Secretary, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy (E-mail: [codex@fao.org](mailto:codex@fao.org), Fax: +39 (06) 5705 4593), with a copy to Mr. Paul Nunn, Consumer Choice, Food Standards and Special Projects Division, Food Standards Agency, Aviation House, 125 Kingsway, London, WC2B 6NH, United Kingdom (Fax: +44(0)20 7276 8193, E-mail: [ccfo@foodstandards.gsi.gov.uk](mailto:ccfo@foodstandards.gsi.gov.uk)) **no later than 30 January 2005.****

**A. Proposed Draft Amendment to the Standard for Named Vegetable Oils (Rice Bran Oil: Prepared by India)**

In the 16<sup>th</sup> Session of the Codex Committee on Fats and Oils held at London, U.K. on 8-12<sup>th</sup> March, 1999, the delegation of India proposed to include the development of provisions of rice bran oil in view of its important production in several Asian countries and its specific nutritional qualities. The 18<sup>th</sup> Session of the Committee decided to develop a Standard for Rice Bran Oil and this proposal was approved as new work by the 26<sup>th</sup> Session of the Codex Alimentarius Commission. The Draft Proposal for Rice Bran Oils for inclusion in the Standards for Named Vegetable Oils was prepared by India and is attached as Annex I to this document.

**B. Proposed Draft Amendments to the Standard for Named Vegetable Oils (Sesame seed Oils: Proposal from Germany)**

The 18<sup>th</sup> Session of the Committee decided to modify fatty acid composition of sesameseed oil following the proposal by the delegation of Germany and this proposal was approved as new work by the 26<sup>th</sup> Session of the Codex Alimentarius Commission. The proposal by Germany at the 18<sup>th</sup> Session of the Committee is attached as Annex II to this document.

**C. Additional Compositional Data for Mid-Oleic Sunflower Oil (submission from the United States)**

During the consideration of the Proposed Draft Standard for Mid-Oleic Sunflower Oil which took place in the 18<sup>th</sup> Session of the Committee, the United States, which had proposed the Draft Standard, suggested to provide additional data in response to the questions raised as to the submitted data. The Standard was adopted at Step 8 by the 26<sup>th</sup> Codex Alimentarius Commission. However, the United States submitted additional compositional data to the 19<sup>th</sup> Session of the Committee, which is attached as Annex III to this document.

**Proposed Draft Amendment to the Standard for Named Vegetable Oils (Rice Bran Oil)  
(At Step 3 of the Procedure)**

The Appendix to this Standard is intended for voluntary application by commercial partner and not for application by governments.

**1. SCOPE**

This Standard applies to edible rice bran oil but does not apply to rice bran oil, which must be subject to further processing in order to render it suitable for human consumption.

**2. DESCRIPTION**

**2.1 Product Definition**

2.1.1 Rice bran oil [synonyms: Rice oil; *Oryza sativa* L] means the oil derived from the layers around the endosperm of rice.

**2.2 Other Definitions**

2.2.1 Edible vegetable oils are foodstuffs, which are composed of glycerides of fatty acids. They are obtained only from vegetable sources. They may contain small amounts of other lipids such as phosphatides, of Unsaponifiable constituents and of free fatty acids naturally present in the fat or oil.

**3. ESSENTIAL COMPOSITION AND QUALITY FACTORS**

**3.1 GLC Ranges of Fatty Acid Composition (Expressed as percentage)**

Samples falling with the appropriate ranges specified in the table below 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.

**Table**

<b>Fatty acid</b>	<b>% of total fatty acids</b>	<b>Fatty acid</b>	<b>% of total fatty acids</b>
C6:0	ND	C18:2	33-40
C8:0	ND	C18:3	0.2-2.9
C10:0	ND	C20:0	ND-0.5
C12:0	Less than 0.2	C20:1	ND-0.5
C14:0	0.4-0.6	C20:2	ND
C16:0	14-22	C22:0	ND-0.5
C16:1	ND-0.5	C22:1	ND
C17:0	ND	C22:2	ND
C17:1	ND	C24:0	ND
C18:0	0.9-2.5	C24:1	ND
C18:1	38-46		

#### 4. FOOD ADDITIVES:

4.1 **Flavour** – No food additives are permitted in Rice Bran Oil.

#### 4.2 Antioxidants

		<u>Maximum Level</u>
304	Ascorbyl Palmitate]	500 mg/kg individually
305	Ascorbyl Stearate]	or in combination
306	Mixed tocopherols concentrate	GMP
307	Alpha- tocopherol	GMP
308	Synthetic gamma – tocophero	GMP
309	Synthetic delta – tocopherol	GMP
310	Propyl gallate	100 mg/kg
319	Tertiary butyl hydroquinone [TBHQ]	120 mg/Kg
320	Butylated hydroxyanisole [BHA]	175 mg/kg
321	Butylated Hydroxytoluene [BHT]	75 mg/kg
	Any combination of gallates, BHA, BHT and/or TBHQ	200 mg/kg, but limits above not to be exceeded.
389	Dilauryl thiodipropionate	200 mg/kg

#### 4.3 Antioxidant Synergists

330	Citric Acid	GMP
331	Sodium Citrate	GMP
384	Isopropyl citrates) Monoglyceride citrate)	100 mg/kg individually or in combination

#### 4.4 Anti-foaming agent (oils for deep-frying)

900a	Dimethyl polysiloxan	10 mg/kg
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### 5. CONTAMINANTS

#### 5.1 Heavy Metals

The products covered by the provisions of this Standard shall comply with maximum limits being established by the Codex Alimentarius Commission but in the meantime the following limits will apply:

#### Maximum permissible concentration

Lead (Pb)	0.1 mg/kg
Arsenic (As)	0.1 mg/kg

#### 5.2 Pesticide Residues

The products covered by the provisions of this Standard shall comply with those maximum residue limits established by the Codex Alimentarius Commission for these commodities.

## 6. **HYGEINE**

6.1 It is recommended that the product covered by the provisions of this Standard be prepared in accordance and handled in accordance with the appropriate sections of the Recommended International Code of practice – General Principles of Food Hygiene [CAC/RCP 1-1969, Rev. 3-1997], and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

6.2 The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods [CAC/GL 21-1997]

## 7. **LABELLING**

### 7.1 **Name of the Food**

The product shall be labelled in accordance with the Codex General Standard for the Labelling of Prepackaged Food (CODEX STAN 1-1985, Rev. 1-1991). The name of the oil shall conform to the description given in Section 2 of this Standard.

### 7.2 **Labelling of Non-Retail Containers**

Information on the above labelling requirements shall be given either on the container or in accompanying documents, except that the name of the food, lot identification and the name and address of the manufacturer or packer shall appear on the container.

However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

## 8. **METHODS OF ANALYSIS AND SAMPLING**

### 8.1 **Determination of Fatty Acid Composition**

According to IUPAC 2.301, 2.302 and 2.304 or ISO 5508: 1990/5509: 1999.

### 8.2 **Determination of Relative Density**

According to IUPAC 2.101, with the appropriate conversion factor. Results are expressed as relative density at 20°C/water at 20°C.

### 8.3 **Determination of Arsenic**

According to AOAC 952.13, IUPAC 3.136, AOAC 942.17, or AOAC 985.16.

### 8.4 **Determination of Lead**

According to IUPAC 2.632, AOAC 994.02 or ISO 12193: 1994 or AOCS Ca 18c-91.

## OTHER QUALITY AND COMPOSITION FACTORS

This text is intended for voluntary application by commercial partners and not for application by governments.

### 1. QUALITY CHARACTERISTICS

**1.1** The **colour, odour and taste** shall be characteristic of the product. It shall be free from foreign and rancid odour and taste.

	<u>Maximum level</u>
<b>1.2 Matter volatile at 105°C</b>	0.2 % m/m
<b>1.3 Insoluble impurities</b>	0.05 % m/m
<b>1.4 Soap content</b>	0.005 % m/m
<b>1.5 Iron (Fe):</b> Refined oils	1.5 mg/kg
<b>1.6 Copper (Cu)</b> Refined oils	0.1 mg/kg
<b>1.7 Acid value</b> Refined oils	0.5 mg KOH/g Oil
<b>1.8 Peroxide value:</b> Refined oils	up to 10 milliequivalents of active oxygen/kg oil

### 2. COMPOSITION CHARACTERISTICS

**2.1.** The gamma oryzanols in Crude Rice Bran Oil shall be in the range of 1.3 percent to 2.0 percent

### 3. CHEMICAL AND PHYSICAL CHARACTERISTICS

Chemical and Physical Characteristics are given below: -

S.NO.	CHARACTERISTIC	VALUE
1	Specific gravity at 30 <sup>0</sup> / 30 <sup>0</sup>	0.910 to 0.920
2	Refractive Index at 40 <sup>0</sup> C	1.460 – 1.473
3	Saponification Value [mg KOH/g oil]	180-195
4	Iodine Value [Wijs]	90-105
5	Unsaponifiable matter	not more than 3.5percent
6	Acid Value	not more than 0.5 percent
7	Flash Point (Pensky Martens closed, method)	not less than 250 <sup>0</sup> C

#### 4. IDENTITY CHARACTERISTICS

4.1 **Levels of desmethylsterols** in Rice Bran Oil as a percentage of total sterols are given below:

	<b>Range,</b>
Cholesterol	ND- 0.5
Brassicasterol	ND
Campesterol	23 – 32
Stigmasterol	9 - 17
Beta-Sitosterol	55 - 67
Delta-5-avenasterol	ND
Delta-7-avenasterol	ND
Others	ND
<b>Total Sterols [mg/kg]</b>	<b>16620 - 25000</b>

4.2 **Levels of tocopherols and tocotrienols** in Rice Bran Oil [mg/kg] are given below: -

Sample	Tocotrienols			Tocopherols		
	Delta	Beta/ Gamma	Alpha	Delta	Beta/ Gamma	Alpha
1.CrudeRBO	5-59	231-860	8-122	5-31	202-441	49-176
2.Degummed RBO	58	386	82	39	154	107
3.Deodorized RBO	16	218	41	6	62	38

#### 5. METHODS OF ANALYSIS AND SAMPLING

##### 5.1 Determination of moisture and volatile matter at 105°C

According to ISO 662: 1998.  
Codex Type I Method.

##### 5.2 Determination of insoluble impurities

According to ISO 663: 1998.  
Codex Type I Method.

##### 5.3 Determination of soap content

According to BS 684 Section 2.5; or AOCS Cc 17-95 (97).  
Codex Type I Method.

##### 5.4 Determination of copper and iron

According to ISO 8294: 1994; or AOAC 990.05; or AOCS Ca 18b-91 (97)

##### Codex Type II Method 5.5 Determination of relative density

According to IUPAC 2.101, with the appropriate conversion factor.  
Codex Type I Method

**5.5 Determination of refractive index**

According to ISO 6320: 2000; or AOCS Cc 7-25 (02)  
Codex Type II Method

**5.6 Determination of saponification value (SV)**

According to ISO 3657: 2002; or AOCS Cd 3-25 (02)  
Codex Type I Method

**5.7 Determination of iodine value (IV)**

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Wijs - ISO 3961: 1996; or AOAC 993.20; or AOCS Cd 1d-1992 (97); or by calculation – AOCS Cd 1b-87 (97)

The method to be used for specific named vegetable oils is stipulated in the Standard  
Codex Type I Method

**5.8 Determination of unsaponifiable matter**

According to ISO 3596: 2000; or ISO 18609: 2000; or AOCS Ca 6b-53 (01)  
Codex Type I Method

**5.9 Determination of peroxide value (PV)**

According to AOCS Cd 8b-90 (02); or ISO 3961: 2001  
Codex Type I Method

**5.10 Determination of sterol content**

According to ISO 12228: 1999; or AOCS Ch 6-91 (97)  
Codex Type II Method

**5.11 Determination of tocopherol content**

According to ISO 9936: 1997; or AOCS Ce 8-89 (97)  
Codex Type II Method



**Proposed Amendments of the Fatty Acid Composition of Sesameseed Oil  
(Proposal from Germany)**

**Fatty acid composition of Sesameseed oil as determined by GLC from 16 authentic samples  
from Nigeria (5), Sudan (5), India (5), and Uganda (1)**

**New proposed values in bold type**

<b>Fatty acid</b>	<b>Alinorm 01/17 Appendix II Table 1</b>	<b>Proposal Germany 2001</b>
6:0	NN	
8:0	NN	
10:0	NN	
12:0	NN	
14:0	NN - 0,1	
16:0	7,9 – 12,0	
16:1	0,1 - 0,2	
17:0	NN - 0,2	
17:1	NN - 0,1	
18:0	4,8 - 6,1	4,8 - <b>6,7</b>
18:1	35,9 - 42,3	35,9 – <b>43,0</b>
18:2	41,5 - 47,9	<b>39,1</b> - 47,9
18:3	0,3 - 0,4	0,3 - <b>0,5</b>
20:0	0,3 – 0,6	0,3 – <b>0,7</b>
20:1	NN - 0,3	
20:2	NN	
22:0	NN - 0,3	NN – <b>1,1</b>
22:1	NN	
22:2	NN	
24:0	NN - 0,3	
24:1	NN	

### Additional Compositional Data for Mid-Oleic Sunflower Oil (Submission by the United States)

At the 18th Session of the Codex Committee on Fats and Oils, it was decided that the U.S. would provide additional compositional data for mid-oleic sunflower oil.

In addition to the data from 66 samples (2001) presented at the 18th Session, 39 more samples of mid-oleic sunflower seeds were collected from Canada and the major geographical areas in the U.S. where the crop is grown including the states of Colorado, Kansas, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota and Texas for 2002 and 2003. The data for the years 2001, 2002, and 2003 are presented in Table 1 – Table 4.

These samples were collected following the procedures referenced in Section 5 on methods of analysis and sampling in "Other Quality and Composition Factors" of the Standard for Named Vegetable Oils. The oil was extracted and analyzed for fatty acid composition (Table 1.); relative density, refractive index, saponification value, iodine value and unsaponifiable matter (Table 2); desmethylsterols (Table 3.); and tocopherol content (Table 4.). Table 5 provides estimates of mid-oleic sunflower acreage, production, crush and export of oil.

Table 1. Fatty acid compositions of crude mid-oleic sunflower oils as determined by gas liquid chromatography from authentic samples<sup>1</sup> (expressed as percentage of total fatty acids) for 2001-2003.

Fatty Acids		
C6:0	ND	
C8:0	ND	
C10:0	ND	
C12:0	ND	
C14:0	0.4-0.8	
C16:0	4.0-5.5	
C16:1	ND-0.12	
C17:0	ND-0.05	
C17:1	ND-0.06	
C18:0	2.1-5.0	
C18:1	43.1-71.8	
C18:2	18.7-45.3	
C18:3	ND-0.1	
C20:0	0.2-0.4	
C20:1	0.2-0.3	
C20:2	ND	
C22:0	0.6-1.1	
C22:1	ND	
C22:2	ND-0.09	
C24:0	0.2-0.4	
C24:1	ND	
ND=not detectable		

Table 2. Chemical and physical characteristics of crude mid-oleic sunflower oils for 2001-2003.

Relative Density	0.905-0.914
Refractive Index (ND 40C)	1.461-1.471 at 25C
Saponification Value (mg KOH/g oil)	190-191
Iodine Value (by calculation from fatty acids)	92-124
Unsaponifiable matter (g/kg)	≤15

Table 3. Levels of desmethylsterols in crude mid-oleic sunflower oils<sup>1</sup> from authentic samples as a percentage of total sterols and as mg/kg oil for 2001-2003.

Desmethylsterols	mg/kg	% of total
Cholesterol	3.7-9.5	0.1-0.2
Brassicasterol	ND-4.8	ND-0.1
Campesterol	305-449	8.2-9.6
Stigmasterol	316-534	8.5-12.5
Beta-sitosterol	2234-2792	56-65
Delta-5-avenasterol	36-249	0.8-5.8
Delta-7-stigmasterol	290-457	7.7-10.7
Delta-7-avenasterol	97-217	4.3-5.1
Others	38-276	1.0-5.8
Total sterols (mg/kg)	3763-4815 mg/kg	
ND=not detectable		
<sup>1</sup> data taken from species as listed in Section 2		

Table 4. Levels of tocopherols in crude mid-oleic sunflower oils from authentic samples<sup>1</sup> (expressed as mg/kg oil) for 2001-2003.

Tocopherols	mg/kg		
Alpha tocopherol	481-1073		
Beta tocopherol	19-59		
Gamma tocopherol	2.3-24		
Delta tocopherol	ND-3.2		
Alpha tocotrienol	ND		
Gamma tocotrienol	ND		
Delta tocotrienol	ND		
Total	502-1159		
ND=not detectable			
<sup>1</sup> data taken from species as listed in Section 2			

Table 5. Estimates of mid-oleic sunflower acreage/production /crush/export in metric tons

<u>Year</u>	<u>Acreage</u>	<u>Hectares</u>	<u>Production</u>	<u>Crush</u>	<u>Oil Produced</u>	<u>Domestic Use</u>	<u>Export</u>
1999-00	150,000	61,000	94,000	60,000	24,600	20,000	4,600
2000-01	600,000	243,000	374,000	270,000	111,000	90,000	21,000
2001-02	650,500	263,000	406,000	275,000	113,000	95,000	18,000
2002-03	725,000	293,000	395,000	179,000	75,000	70,000	5,000
2003-04	1,000,000	405,000	570,000	400,000	164,000	150,000	14,000