

CODEX ALIMENTARIUS COMMISSION



Food and Agriculture
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Agenda Item 6

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

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PROPOSED REVISION TO THE STANDARD FOR NAMED VEGETABLE OILS (CODEX STAN 210-1999), ADDITION OF PALM OIL WITH HIGH OLEIC ACID (OXG)

(Prepared by Colombia)

2. DESCRIPTION

2.1 Product Definitions

(Note: synonyms are in brackets immediately following the name of the oil)

Palm oil – high oleic acid (high oleic acid palm oil) is derived from the fleshy mesocarp of hybrid palm fruit OXG (*Elaeis oleifera* x *Elaeis guineensis*).

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

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

High Oleic Palm oil must contain not less than 50% oleic acid (as % of total fatty acids).

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

Fatty acid	<u>Palm oil high oleic acid</u>
C6:0	<u>ND</u>
C8:0	<u>ND</u>
C10:0	<u>ND</u>
C12:0	<u>ND – 0.4</u>
C14:0	<u>ND – 0.7</u>
C16:0	<u>25.0– 34.0</u>
C16:1	<u>ND – 0.8</u>
C17:0	<u>ND- 0.2</u>
C17:1	<u>ND</u>
C18:0	<u>2.0 – 4.5</u>
C18:1	<u>50.0 – 58.0</u>
C18:2	<u>10.0 – 14.0</u>
C18:3	<u>ND – 0.6</u>
C20:0	<u>ND – 0.4</u>
C20:1	<u>ND-0.2</u>
C20:2	<u>ND- 0.5</u>
C22:0	<u>ND</u>

C22:1	<u>ND</u>
C22:2	<u>ND</u>
C24:0	<u>ND-0.2</u>
C24:1	<u>ND</u>

ND - non detectable, defined as $\leq 0.05\%$

¹Data taken from species listed in Section 2.

Table 2: Chemical and physical characteristics of crude vegetable oils (see Appendix of the Standard)

	<u>Palm oil high oleic acid</u>
Relative density (x °C/water at 20°C)	<u>0.8957-0.910</u> <u>(50 °C/water a 20 °C)</u>
Apparent density (g/ml)	<u>ND</u>
Refractive index (ND 40°C)	<u>1.459-1.462</u>
Saponification value (mg KOH/g oil)	<u>189-199</u>
Iodine value	<u>62-72</u>
Unsaponifiable matter (g/kg)	<u>≤12</u>
Stable carbon isotope ratio *	-

* For the method see the following publications:

- Woodbury SP, Evershed RP and Rossell JB (1998). Purity assessments of major vegetable oils based on gamma 13C values of individual fatty acids. JAOCS, 75 (3), 371-379.
- Woodbury SP, Evershed RP and Rossell JB (1998). Gamma 13C analysis of vegetable oil, fatty acid components, determined by gas chromatography-combustion-isotope ratio mass spectrometry, after saponification or regiospecific hydrolysis. Journal of Chromatography A, 805, 249-257.
- Woodbury SP, Evershed RP, Rossell JB, Griffith R and Farnell P (1995). Detection of vegetable oil adulteration using gas chromatography combustion / isotope ratio mass spectrometry. Analytical Chemistry 67 (15), 2685-2690.
- Ministry of Agriculture, Fisheries and Food (1996). Authenticity of single seed vegetable oils. Working Party on Food Authenticity, MAFF, UK.

Table 3: Levels of desmethylsterols in crude vegetable oils from authentic samples¹ as a percentage of total sterols (see Appendix of the Standard)

	<u>Palm oil high oleic acid</u>
Cholesterol	<u>2.2-4.7</u>
Brassicasterol	<u>ND-0.4</u>
Campesterol	<u>16.6-21.9</u>
Stigmasterol	<u>11.5-15.5</u>
Beta-sitosterol	<u>57.2-60.9</u>
Delta-5-avenasterol	<u>1-1.9</u>
Delta-7-stigmastenol	<u>ND-0.2</u>
Delta-7-avenasterol	<u>ND-1.0</u>
Others	<u>ND-1.8</u>
Total sterols (mg/kg)	<u>519-1723</u>

ND - Non-detectable, defined as ≤ 0.05%

¹ Data taken from species listed in Section 2.

Table 4: Levels of tocopherols and tocotrienols in crude vegetable oils from authentic samples (mg/kg) (see Appendix of the Standard)

	<u>Palm oil high oleic acid</u>
Alpha-tocopherol	<u>128 - 152</u>
Beta-tocopherol	<u>ND</u>
Gamma-tocopherol	<u>4 - 138</u>
Delta-tocopherol	<u>0 - 31</u>
Alpha-tocotrienol	<u>165 - 179</u>
Gamma-tocotrienol	<u>475 - 586</u>
Delta-tocotrienol	<u>35 - 61</u>
Total (mg/kg)	<u>678 - 956</u>

ND - Non-detectable

¹ Data taken from species listed in Section 2.