

**Agenda Item 6**

CX/FO 13/23/6

**JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON FATS AND OILS**

Twenty-third Session

Langkawi, Malaysia, 25 February – 1 March 2013

**DISCUSSION PAPER ON COLD PRESSED OILS
(Prepared by Iran)****INTRODUCTION**

The 22nd Session of the Codex Committee on Fats and oils (CCFO) held in Penang, Malaysia, 21 - 25 February 2011 agreed to establish an electronic Working Group (EWG) on Cold pressed oil led by Iran. Participants from Germany, Ecuador, Chile, Argentina, USA, Canada, Malaysia, Australia, joined the EWG. Iran reviewed all related documents and followed a domestic project to prepare the basic structure for the proposed standard, resulting in a document which was sent to participants of the EWG for comments. Iran reviewed the replies /comments and made the following changes:

1-A Discussion paper on the proposal was prepared and circulated between participants of EWG. Then it will be discussed in the next session of CCFO.

2- The Draft proposal for the standard will be targeted on specifications of Nut oils and the seed oils which are not covered by *CODEX STAN 210-1999*. Specifications for other oilseeds have to be referred to the mentioned standard.

BACKGROUND

'Cold-pressed' is derived from the German words 'kaltgeschlagen', which literally mean 'cold pummelled'. In Switzerland, 'cold-pressed' is defined to mean that oils have not reached temperatures exceeding 50°C. No external heat is supplied to the oil rather the heat is produced to a very high temperature during deodorization. This confirms the fact that no external heat is produced in modern processes. The heat is produced because of the pressure & rotational friction. In Germany oil was produced 100 years ago at home itself by the women, manually. The seeds were poured into a wedge-3ped container & a wooden edge was driven into it. The housewife usually hit the wedge with a wooden mallet & the oil would drip for an hour. This process was continued for every single hour. The temperature ranges from 85 and 95°C for dripping of the oil. Nearly all cold pressed oils are a natural source of Vitamin E, an important antioxidant, beneficial to general wellbeing. Most oils also contain the Essential Fatty Acids commonly known as Omega 3 and 6. These products, which are just cold pressed and filtered, result in oils that are naturally free from trans fats and full of natural antioxidants. Consumption of more healthy foods like cold pressed oil is being raised in the different countries. As a result, production of this kinds of oils have a significant positive growth in recent years. In Iran like many other countries with a long history, cold pressed oils were used for years. There are more than 20 cold pressed oil production units in Iran which are active now. It is also a well known and established industry in European countries as well as India, Pakistan, and South America and many other areas.

CONCLUSIONS

1-CODEX STAN 210-1999 covers nearly all commodity oils but does not cover cold pressed oils.

2-Also CODEX STAN 19-1981 does not provide specifications for oil derived from nuts and some other cold pressed oils. The description of cold pressed oils also might be developed.

3-As these kind of oils are being consumed directly and without any refining procedure, food safety issues have to be considered to ensure the safety of the product for consumers.

4-It is important to provide Specifications for cold pressed oil which are not covered by mentioned standards to provide key data for the determination of purity.

Also Iran started a domestic study to prepare data as a structure for the new standard which had been sent to members of EWG. According to some comments of members it was edited as follows

Introduction

The aim of this standard is setting of quality and purity criteria for edible cold pressed oils. The normative documents for this standard are as follow:

CODEX STAN 19-1981

CODEX STAN 210-1999

Edible cold pressed oils- Specification

1. Scope

This Standard applies to edible cold pressed oils described in Section 1.1 presented in a state for human consumption.

1.1 Oilseeds and nut oils

1.1.1 Walnut oil

Derived from walnut kernel (*Juglans regia* L.).

1.1.2 Almond oil

Derived from sweet almond kernel (*Amygdalus communis* L.).

1.1.3 Hazelnut oil

Derived from hazelnut kernel (*Corylus avellana* L.).

1.1.4 Pistachio oil

Derived from pistachio kernel (*Pistacia vera* L.).

1.1.5 Sesame oil

Derived from sesame seeds (*Sesamum indicum* L.).

1.1.6 Sunflower oil

Derived from sunflower seeds (*Helianthus annuus* L.).

1.1.7 Peanut oil

Derived from groundnuts (*Arachis hypogaea* L.).

1.1.8 Maize oil

Derived from corn seed embryo (*Zea Mays* L.)

1.1.9 Safflower oil

Derived from safflower seed (*Carthamus tinctorius* L.)

Any other suggestions from other participants

Note: Specifications for sesame, maize, safflower and sunflower and other oils referred to CODEX STAN 210-1999

Note 1: for other nuts and oilseeds like Grape seed, hempseed, Pumpkin seed, macadamia and etc. more information is needed through group cooperation.

Note2: Edible cold pressed oils must not be blended with refined edible oils.

Note3: for mixed edible cold pressed oils, the name of oils and their proportions in blend shall be declared on the label.

Note 4: This standard should not be applied for virgin olive oils.

2. Description

Cold pressed fats and oils

Oil derived from edible oilseeds, nuts and fruit kernels by means of mechanical or other physical methods, at temperatures below 40°C that do not lead to alterations in the nature of oil of oilseeds, nuts, fruit kernels and which have not undergone any treatment other than washing, decanting, centrifugation and filtration.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

GLC ranges of fatty acid composition (expressed as percentages)

Fatty acid composition should be according to Table 1

Table 1 – fatty acid composition of edible cold pressed oils (expressed as percentage of total fatty acids)

Fatty acid	Ground nut oil	Almond oil	Hazelnut oil	Pistachio oil	Walnut oil
C6:0	nd	nd	nd	nd	nd
C8:0	nd	nd	nd	nd	nd
C10:0	nd	nd	nd	nd	nd
C12:0	0-0.1	nd	nd	nd	nd
C14:0	0-0.1	nd	nd	0-0.6	nd
C16:0	8-14	4-13	4.7-7.2	8-13	7-8
C16:1	0-0.2	0.2-0.6	0.1-0.3	0.5-1	0.1-0.2
C17:0	0-0/1	nd	nd	nd	nd
C17:1	-0/1	nd	nd	nd	nd
C18:0	1-4.5	2-10	1.5-2.4	0.5-2	1.8-2.2
C18:1	35-69	43-60	71.9-84	56-70	17-19
C18:2	12-43	20-34	5.7-22.2	18-31	56-60
C18:3	0-0.3	nd	0-0.2	0.1-0.4	13-14
C20:0	1-2	0.1-0.5	0-0.1	0-0.3	0-0.1
C20:1	0.7-1.7	0-0.3	0.1-0.3	0-0.6	0-0.2
C20:2	nd	nd	nd	nd	nd
C22:0	1.5-4.5	nd	nd	nd	nd
C22:1	0-0.3	nd	nd	nd	nd
C22:2	nd	nd	nd	nd	nd
C24:0	0.5-2.5	nd	nd	nd	nd
C24:1	0-0.3	nd	nd	nd	nd
C18:1t	≤0.1	≤0.1	≤0.1	≤0.1	≤0.1
C18:2 t + C18:3 t	≤0.1	≤0.1	≤0.1	≤0.1	≤0.1

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

4. Food Additives

No food additives are permitted in cold pressed oils.

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

5. CONTAMINANTS

The maximum levels of contaminants should be as follow:

- 5.1 PAHs 2 $\mu\text{g}/\text{kg}$ Benzo(α)pyrene
- 5.2 Fumanisin and zearalenone for maize oil (under study)
- 5.3 Pb 0.1 mg/kg
- 5.4 As 0.1 mg/kg
- 5.5 Pesticide residue (Under Study)

5.2 The products covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.(it is suggested to add the standard text on pesticides in the standards for fats and oils)

6. HYGIENE

6.1 It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969), 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 21-997).

7. LABELLING

7.1 Name of the food

The product shall be labeled in accordance with the Codex General Standard for the Labeling of Prepackaged Foods (CODEX STAN 1-1985). The name of the oil shall conform to the descriptions given in Section 2 of this Standard.

7.2 In case the product is a blend of different cold pressed oils (section 1-1) , Name and proportion of each oil in blend.

7.3 The production and the expire date

7.4 The net weight of oil

7.5 Any Information regarding warning of customer for allergens in oils like sesame, peanut and etc.

7.6 Any Information regarding usage like not suitable for frying and etc.

8- Packaging

The packaging of edible cold pressed oil should be in approved dark bottles (glass bottle is recommended) .approved cans and Multi -layered paper-plastic packaging (tetra pack and etc.)

OTHER QUALITY AND COMPOSITION FACTORS

1. QUALITY CHARACTERISTICS

1.1 The color, odor and taste of each edible cold pressed oil shall be characteristic of the designated product. It shall be natural flavor and free from foreign and rancid odor and taste. Other quality characteristics shall be as follow:

Quality criteria	Maximum level
Matter volatile at 105 Degree centigrade	0.2 % m/m
Insoluble impurities	0.05% m/m
Peroxide value	Up to 15 meq o ₂ /kg oil
Acid value	Up to 2 mg KOH/ g oil
Soap content	0.0 mg/kg
Cu	0.4mg/kg
Fe	5mg/kg

2. CHEMICAL AND PHYSICAL CHARACTERISTICS

Chemical and Physical Characteristics are given in Table 2.

Table 2- physicochemical characters of edible cold pressed oils

specification	Non saponifiables mater (g/kg)	Iodine value	Saponification value (mg KOH/g oil)	Refractive index (ND 40°C)	Density (x°C/water °C)

oil					
Ground nut	≤10	86-107	187-196	1.460-1.465	0.912-0.920 20°C/water 20°C
Almond	≤20	94-105	188-200	1.462-1.466	0.910-0.916 25°C/water 25°C
Hazelnut	≤0.5	83-90	188-197	1.456-1.463	0.908-0.915 25°C/water 25°C
Pistachio	≤20	84-96	189-195	1.460-1.466	0.919-0.20 15.5°C/water 15.5°C
Walnut	≤25	138-162	189-197	1.469-1.471	0.923-0.925 25°C/water 25°C

3. IDENTITY CHARACTERISTICS

3.1 Levels of desmethylsterols and total sterols in cold pressed oils from authentic samples¹ are given in Table 3.

Table 3- Levels of sterols in edible cold pressed (mg/kg)

Sterols composition	Walnut oil	Pistachio oil	Hazelnut oil	Almond oil	Ground nut oil
cholesterol	nd	nd	nd	nd	0-3.8
Brassicasterol	nd	nd	nd	nd	0-0.2
Campesterol	4-6	4-6	4-6	2-4	12-19.8
Stigmasterol	n.d	1-3	0-2	1-2	5.4-13.2
Beta-sitosterol	85-92	75-79	90-96	80	47.4-69
Delta-5-avenasterol	4-6	6-8	1-3	10-12	5-18.8
Delta-7-stigmastenol	nd	0-2	nd	1-2	0-5.1
Delta-7-avenasterol	nd	nd	nd	1-2	0-5.5
Others	nd	nd	nd	nd	0-1.4
Total sterols (mg/kg)	1760	2010	1200	2660	900-2900

ND - Non-detectable, defined as ≤ 0.05%

3.2 Levels of tocopherols and tocotrienols and total tocopherols in cold pressed oils from authentic samples are given in Table 4

Table 4: Levels of tocopherols and tocotrienols in edible cold pressed oils (mg/kg)

oil	Alpha-tocopherol	Beta-tocopherol	Gamma-tocopherol	Delta-tocopherol	Alpha-tocotrienol	Gamma-tocotrienol	Delta-tocotrienol	Total (mg/kg)
Groundnut oil	49-37.3	nd-41	88-389	nd-22	nd	nd	nd	170-1300
Almond oil	20-43.9	nd-10	5-104	nd-5	nd	nd	nd	100-450
Hazelnut oil	100-420	6-12	18-194	nd-10	nd	nd	nd	200-600
Pistachio oil	10-330	nd	0-100	nd-50	nd	nd	nd	100-600
Walnut oil	nd-50	nd	120-400	nd-60	nd	nd	nd	309-455

Note: Maize oil also contains ND-52 mg/kg beta tocotrienol.

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

3.2 Levels of triacylglycerols in edible cold pressed oils (expressed as percentage of total triacylglycerols) (Under Study)

Table 5-Levels of triacylglycerols in edible cold pressed oils (expressed as percentage of total triacylglycerols) (Under Study)

4. Purity criteria

4.1 Total trans fatty acid $\leq 0.2\%$ of total fatty acids

4.2 Total of Styrenes $\leq 0.15\text{mg/kg}$ (Under Study)