

codex alimentarius commission



FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD
HEALTH
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 4

CX/FO 05/19/4

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

Nineteenth Session

London, United Kingdom, 21– 25 February 2005

CONSIDERATION OF THE LINOLENIC ACID LEVEL IN SECTION 3.9 OF THE STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS

SURVEY OF THE ANALYTICAL CHARACTERISTICS OF EDIBLE VIRGIN OLIVE OILS BY PRODUCING AREA OF THE PRODUCER COUNTRIES

Report of the Executive Secretariat of the International Olive Oil Council (IOOC)

Governments and international organizations wishing to submit comments 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, 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) **no later than 8 February 2005.**

At its 26th session held in Rome from 30 June to 7 July 2003, the Codex Alimentarius Commission adopted the revised Codex standard for olive oils and olive-pomace oils. However, the text adopted featured a modification with respect to the draft standard agreed by the Codex Committee on Fats and Oils. As a compromise solution in response to the request of the delegations of Australia and New Zealand (backed by other delegations) to raise the proposed 1% limit for linolenic acid to 1.5%, the Codex Alimentarius Commission adopted the draft proposed standard without any specification of a limit for linolenic acid content and inserted a footnote stating: "*Pending the results of the IOOC survey and further consideration by the Committee on Fats and Oils, national limits may remain in place*".

The IOOC made a pledge to the Codex Committee on Fats and Oils and to the Codex Alimentarius Commission to conduct a survey of all the olive oil producing countries in order to assemble the necessary data to incorporate fatty acid composition ranges representative of world olive oil production in the international standards.

On 15 October 2003 the IOOC Executive Secretariat circulated a Note Verbale to the competent authorities of the olive oil producer countries enclosing a two-part questionnaire (T.14/Doc. no. 21-1), i.e.:

Part I: description of each olive-growing area of the country and statistics on production and the volume of trade during the last three crop years.

Part II: analytical characteristics of the fatty acid composition of the virgin olive oils produced and fit for immediate consumption. Countries were asked to specify the methods of analysis used, although they were recommended to apply the following ones.

- COI/T.20/Doc. no. 24, "Preparation of the fatty acid methyl esters from olive oil and olive-pomace oil";
- ISO 5508, "Analysis by gas chromatography of methyl esters of fatty acids", or AOCS CH 2-91.

They were likewise asked to supply the fatty acid composition results to one decimal place.

The questionnaire was sent to the following countries:

Producer IOOC Members:

Algeria, Croatia, Egypt, European Community (Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia and Spain), Iran, Israel, Jordan, Lebanon, Libya, Morocco, Serbia and Montenegro, Syria and Tunisia.

Non-IOOC Member producers:

Albania, Argentina, Australia, Brazil, Chile, Iraq, Macedonia, Mexico, New Zealand, Palestine, Peru, Saudi Arabia, South Africa, Turkey and the United States.

The IOOC Executive Secretariat has received data from seven countries: Australia, Egypt, France, Israel, New Zealand, Saudi Arabia and South Africa:

Country	Samples tested	Samples with linolenic cid content > 1
Australia	250 316 188	12 (2002) 17 (2003) 3 (2004)
Egypt	8	0
France	303	28
Israel	42	4
New Zealand	56	0
Saudi Arabia	21	3
South Africa	34	0

In the document accompanying the questionnaire the authorities were strongly recommended to send the IOOC Executive Secretariat representative olive oil samples of the producing areas. The following two countries have forwarded samples:

- Saudi Arabia: 11 samples shipped in October 2004, which have been tested by an IOOC-recognised laboratory.

- Australia: 30 samples received in January 2005, which are being tested by one of the IOOC-recognised laboratories.

AUSTRALIA

Method of analysis used: ISO 5508

Test results expressed to two decimal places

Australia has sent the test results for the characteristics of virgin olive oils for three crop years: 2002, 2003 and 2004. Six growing areas have been considered.

1. New South Wales
2. Queensland
3. South Australia
4. Tasmania
5. Victoria
6. Western Australia

In 2002, 250 samples were analysed. However, Australia has given no indication as to which areas the samples were from or which varieties were used to produce the oils. The results for the 250 samples show that in the case of the data for linolenic acid, 12 samples recorded values above 1%, i.e. 4.76% of the total.

However, the mean works out at 0.75 as can be seen from the table below:

2002 CROP YEAR	
	Linolenic acid
	C18:3
No.samples	250
Mean	0.75
Minimum	0.48
Maximum	1.45
% C18:3 >1	12
% outside standard	4.80%

For 2003, 316 samples were analysed by producing area, 17 of which were found to have linolenic acid values over 1%.

Producing area	No. samples tested per area	% of total samples	Samples with linolenic acid content > 1%
New South Wales	92	29.11	2
Victoria	130	41.14	10
Queensland	2	0.63	0
South Australia	52	16.46	1
Western Australia	35	11.08	3
Tasmania	5	1.58	1
Total	316	100.00	17

As the number of samples tested per area is not uniform, the results have been analysed by comparing the two areas where the largest number of samplings were performed, namely Victoria and New South Wales.

The climatic and agronomic data provided by Australia for these two areas reveal that the same varieties are not used, except for ‘Coreggiola’ and ‘Manzanillo’, and that despite differences in the mean winter rainfall, olive orchards are largely cultivated under irrigation in both areas. As a rule, the other parameters also differ; this is particularly the case of the degree of ripeness at harvest and the harvesting method. The only parameter that the two areas have in common is the mean winter temperatures, taken in January, which lie at around 31.5° C.

The 17 samples with a linolenic acid content of more than 1% account for 5.40% of the total. This percentage is distributed as follows amongst the producing areas:

Producing area	% samples with C18:3 >1% per producing area
New South Wales	0.63
Victoria	3.16
Queensland	0
South Australia	0.32
Western Australia	0.95
Tasmania	0.32
Total	5.38

The table below gives the linolenic acid values for the population of 316 samples. It can be seen that the mean is equal to 0.74.

2003 CROP YEAR	Linolenic acid
	C18:3
No. samples	316
Mean	0.74
Minimum	0.42
Maximum	1.91
% C18:3 >1	17
% outside standard	5.40%

Furthermore, it should be pointed out that in the case of 33 of all the samples tested for 2003, good laboratory practices were not observed with respect to fatty acid composition, which should total 100.

Of the 188 samples tested by Australia for 2004, only 3 had values above 1%, i.e. 1.6% of the total.

The three samples concerned were produced from the ‘Verdale’ variety; one was from Victoria and the other two were from Western Australia. The table below shows that the mean of all the values obtained works out at 0.68.

2004 CROP YEAR Linolenic acid

	C18:3
No. samples	188
Mean	0.68
Minimum	0.47
Maximum	1.61
% C18:3 >1	3
% outside standard	1.60%

However, analysis of the results from the varietal point of view has revealed that in one particular area, Western Australia, the same variety ('Leccino') gave linolenic acid contents amongst the lowest (0.52) and highest values recorded (0.99). The same occurs in South Australia where the 'Koroneiki' variety gave oils recording the lowest value (0.47) and one of the highest contents (0.92).

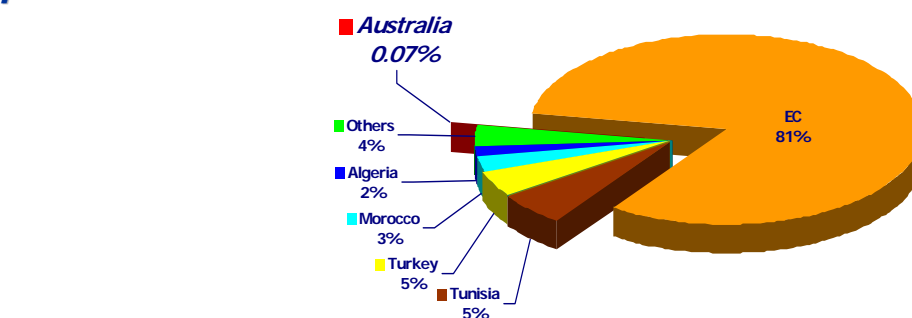
To conclude, of the 754 samples tested over the three crops years taken into consideration, 32 had a linolenic acid content of more than 1%, i.e. 4.2%. The mean linolenic acid content for the set of samples is 0.72, as can be seen from the table below.

**2002/03/04 CROP
YEARS****Linolenic acid**

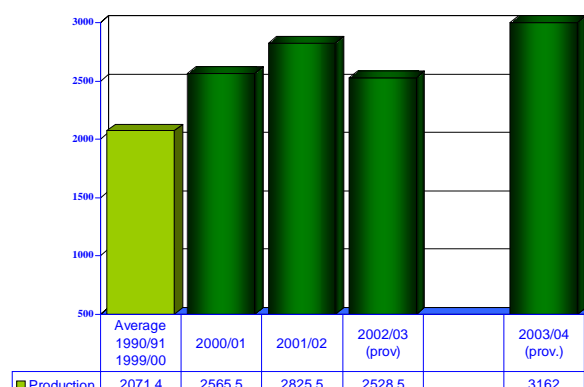
	C18:3
No. samples	754
Mean	0.72
Minimum	0.42
Maximum	1.91
% C18:3 >1	32
% outside standard	4.2%

The charts on the next page, which give average world olive oil production and exports for the 2002/03 and 2003/04 crop years, show that Australia accounts for only 0.07% of the 2,845,000 tonnes of world production and for no more than 0.05% of world exports, which amounted to 525,000 tonnes.

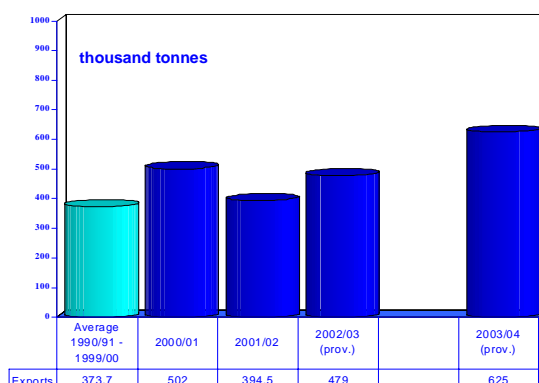
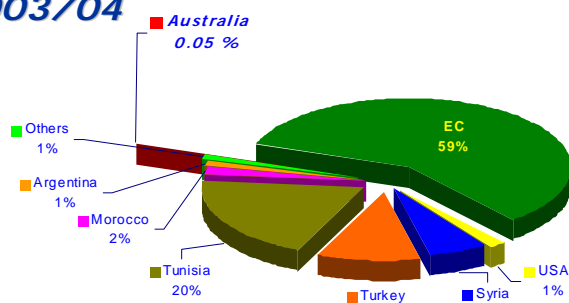
Average world olive oil production: 2002/03-2003/04



thousand tonnes



Average world olive oil exports: 2002/03-2003/04



Source: Australia and IOOC

France

Methods of analysis used: ISO 5508 and ISO 5509

Test results expressed to two decimal places

Three hundred and three samples of the virgin olive oils produced in the four areas cited below over seven crop years (1997/98–2003/04) have been analysed:

1. Haut Var
2. Gard
3. Vaucluse
4. Haute Provence

During the 1998–2004 crop years, 51 samples from the Haut Var area were analysed, 23 of which had linolenic acid values of more than 1%, as can be seen from the table below:

Producing area Haut Var	No. samples tested	Samples with linolenic acid content > 1
97-98 crop year	3	0
98-99 crop year	13	8
99-00 CROP YEAR	7	4
00-01 crop year	4	1
01-02 crop year	6	2
02-03 crop year	13	6
03-04 crop year	5	2
Total	51	23

1998–2004 YEARS	CROP Linolenic acid
	C18:3
No. samples	51
Mean	0.97
Minimum	0.58
Maximum	1.34
% C18:3 >1	23
% outside standard	45%

The area concerned is planted primarily with olive trees belonging to the ‘Bouteillan’ variety.

In the case of the areas of Haute Provence and Vaucluse, 104 and 59 samples were tested respectively, i.e. 163 samples in all. No sample had a linolenic acid value of more than 1%, as can be seen from the next table.

Producing area Haute Provence	No. samples tested	Samples with linolenic acid content > 1
1998 crop year	5	0
1999 crop year	7	0
2000 crop year	16	0
2001 crop year	26	0
2002 crop year	17	0
2003 crop year	15	0
2004 crop year	18	0
Total	104	0

Producing area Vaucluse	No. samples tested	Samples with linolenic acid content > 1
1998 crop year		
1999 crop year	5	0
2000 crop year	11	0
2001 crop year	15	0
2002 crop year	8	0
2003 crop year	8	0
2004 crop year	12	0
Total	59	0

However, in the case of the Gard area, 5 of the 89 samples tested were found to have a linolenic acid content of more than 1%. The 'Picholine' variety is predominant in this area.

1998–2004 YEARS	CROP Linolenic acid
	C18:3
No. samples	89
Mean	0.82
Minimum	0.55
Maximum	1.04
% C18:3 >1	5
% outside standard	5.61%

The total volume of olive oil produced for export in the last two crop years (2001/02 and 2002/03) in the two areas where linoleic acid values of more than 1% were recorded amounted to 51.25 tonnes. This tonnage represents 0.006% of the aggregate exports of the chief producing countries for the same crop years.

Israel

Method of analysis used: Israeli standard 191

Test results expressed to two decimal places

The test results forwarded by Israel are for samples collected through three crop years: 2001, 2002 and 2003. However, only a very small number of samples was analysed in each year, as can be seen from the next table:

Crop year	No. samples tested per area	Samples with a linolenic acid content >1
2001	2	0
2002	29	4
2003	11	0
Total	42	4

Furthermore, Israel did not define a representative, uniform producing area. Instead it has submitted the data for 15 producing sites, which cannot therefore be considered a representative area.

Out of a total of 42 samples for the three crop years considered, four had a value of more than 1; these were only recorded in the 2002 crop year. They account for 9.5% of the total, but the average linolenic acid content works out at 0.81.

2001 – 2002 – 2003

CROP YEARS

Linolenic acid

	C18:3
No. samples	42
Mean	0.81
Minimum	0.4
Maximum	1.33
% C18:3 >1	4
% outside standard	9.5%

It should be added that Israel has not forwarded the data for Part I of the questionnaire, concerning the olive-growing areas of the country and the statistics. However, it is possible to define the varieties that gave values of more than 1%. The varieties concerned are 'Manzanillo', 'Picholine marocaine' and 'Picholine du Languedoc' and, as shown in the table above, such results were only obtained in the 2002 crop year. Still on the subject of varieties, 'Leccino' is the variety that gave the oil with the lowest linolenic acid content (0.4%).

Saudi Arabia

Method of analysis used: non-standardised method

Test results expressed to two decimal places

Twenty-one samples from the Tabuk area were analysed during the 2002 crop year, three of which had linolenic acid values of more than 1%. The oils concerned were made from olives belonging to the 'Sourani', 'Verdale' and 'Coratina' varieties. As Saudi Arabia has not sent full data, they cannot be properly analysed.

Of the 10 samples sent by Saudi Arabia to the IOOC Executive Secretariat and analysed by an IOOC-recognised laboratory according to IOOC-recommended methods, four of the samples had a linolenic acid content of more than 1% (Max: 1.2%).