

codex alimentarius commission

FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD HEALTH
ORGANIZATION

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ALINORM 76/19
January 1976

CODEX ALIMENTARIUS COMMISSION

11th Session, Rome, 29 March-9 April 1976

REPORT OF THE EIGHTH SESSION OF THE CODEX COMMITTEE ON FATS AND OILS London, 24-28 November 1975

INTRODUCTION

1. The Codex Committee on Fats and Oils held its Eighth Session in London under the chairmanship of Mr. A.W. Hubbard of the United Kingdom. The session was attended by representatives from 34 countries, and observers from 8 organizations. A list of participants including officers from FAO and WHO is given in Appendix I.
2. The participants were welcomed on behalf of the Government of the United Kingdom by Dr. A.H. Elton, Chief Scientific Adviser (Food) to the Minister of Agriculture, Fisheries and Food.

ADOPTION OF THE AGENDA

3. The Committee adopted the Provisional Agenda (CX/FO 75/1) but decided to add an additional item 2A on the Health Aspects of the Erucic Acid Content of Rapeseed Oil, and to take item 4 (Revised Identity Characteristics based on GLC) after item 6 (Standard for Low Fat Spread).

HEALTH ASPECTS OF ERUCIC ACID

4. The representative of WHO (Dr. Berglund) summarized information on the effects observed when rapeseed oil containing high levels of erucic acid was fed to a wide variety of experimental animals including rats, ducklings, guinea pigs, rabbits, gerbils, pigs, and squirrel monkeys. The effects included an initial deposition of erucic acid triglycerides in body fat including heart and, after 4-8 weeks feeding, fibrosis of heart muscle. Such changes were observed in rats at levels as low as 2% of erucic acid in the diet (4% of total calories). The myocardial alterations were not accompanied by changes in electrocardiograms. Because of the effects in animals many countries had recommended that the content of erucic acid in the human diet be limited as far as possible. FAO and WHO were currently surveying the literature and research in progress and this problem would be studied early in 1976 by an ad hoc group of experts, together with a study of the wider role of fats and oils in nutrition, including the role of saturated and unsaturated fats in the diet. In reply to the delegates of Canada and Australia the representative of WHO stressed that the effects on animals were related to the total erucic acid content of the diet rather than to whether the oils fed were low erucic acid or high erucic acid content varieties. The delegate of Australia considered that if high erucic acid rapeseed oil were being introduced now as a new food it would have been banned on the evidence currently available. The Chairman noted that the Committee could at its next session expect to receive a report from the FAO/WHO ad hoc group of experts. The absence of a definitive view at present need not preclude the development of a standard for low erucic acid rapeseed oil. This view was agreed. The delegate of Senegal drew attention to other problems relevant to fats and oils that were currently under study in the FAO/WHO environmental programme, e.g. aflatoxin contamination.

SCOPE OF STANDARDS

General Standard for Edible Fats and Oils Not Covered by Individual Standards (CAC/RS 19-1969)

5. The Committee considered in some depth the Scope of the Standard and what action was necessary if there were to be changes. Discussions were based on previous committee decisions (para 22, ALINORM 74/19) and the written comments received in paper CX/FO 75/2.

6. It was generally agreed that the Standard should cover all edible fats and oils in circulation either for direct consumption as such or going to form part of the ingredients of manufactured products for consumption. The Norwegian delegate considered that edible oils used as packing media should be regarded as oils for direct consumption, and should comply with either the general standard for edible fats and oils or the appropriate Codex standard for individual fats and oils. However, there were problems as to how this could be achieved. The United Kingdom advocated a scope to cover the basic product going for direct consumption with additions to descriptions to cover anything added for specific purposes. She was supported in principle by Switzerland, New Zealand, Ghana, Senegal, and the Netherlands. However, the USA, Yugoslavia, Belgium and Australia argued against the modified direct consumption approach preferring that the Standard should clearly cover both types of product with separate additive lists and if necessary labelling modifications.

7. It was agreed that there would be one list for the direct consumption oils, which would exclude emulsifiers, and a separate list of additives that would be compiled for oils and fats going for food manufacture. However, the Netherlands, Federal Republic of Germany and Swiss delegates preferred not to have a second list for manufacturing oils and fats, but suggested a general phrase which would allow such additives in accordance with individual members' legislation or Codex Standards for food products.

8. The Swiss delegate presented a study (Appendix XI) on the effectiveness of Ascorbyl Palmitate as an antioxidant showing that a level of 500 mg/kg is more effective than 300 mg/kg. The Committee decided to revise the maximum level for this additive.

9. Further discussion of the scope also raised doubts about the meaning of the terms "edible" and "virgin", the present definitions in the standard being open to criticism as well as a possible need for consequential amendments to the labelling provisions.

10. It was finally agreed that the amendment proposed by the Committee to the standard would be prepared by the Secretariat and the revised text of the standard (Appendix IV) would be circulated to member countries and interested organizations for comment at Step 3 of the Procedure for the Amendment of Recommended Codex Standards, subject to the approval of the Commission at its 11th Session. In circulating the draft, which would provide for two lists of additives, comments would be requested on the suggestion that, instead of a second list, the wording should allow additives for fats and oils being used in the manufacture of food products to contain those permitted by national legislation and/or as in Codex Lists or Standards for the food products. In addition, requests would be made for:

- (a) further suggested additives for use in food manufacture with their technological justification;
- (b) comments and proposals on the definitions of "edible" and "virgin"; and
- (c) comments on the labelling provisions in the general standard.

The Secretariat would prepare a summary of the comments and suggestions received for the next session of the Committee.

Amendments to the Scope Section of various standards

11. The representative from FAO introduced paper CX/FO 75/3 about possible amendments to the Scope Section of various standards. It was agreed, apart from some reservations about definitions (referred to in para 9 above), that the suggested Scope Section for vegetable oil standards should be added as editorial amendments to the standards concerned but with the addition of the word "further" before "processing". The Scope Section would thus read as follows:

"This standard applies to edible [name of product] but does not apply to [name of product] which must be subject to further processing in order to render it suitable for human consumption",

It was felt that there was no need to make any amendments to the standards for fats of animal origin because the current Scope and Description sections were adequate.

STANDARD FOR MARGARINE - METHOD OF ANALYSIS FOR WATER CONTENT

12. The Chairman referred to document CX/FO 75/5 which summarized comments on the method of analysis proposed by the Netherlands at Appendix IV of ALINORM 74/19. His own views were that the use of a desiccator was good analytical practice, that weighing to 1 mg was sufficient and that the results given in the Netherlands study (CX/MAS/70/C/1) suggested that the initial drying period should be 1½ hours rather than 1 hour.

13. These views were endorsed by the Committee subject to the following points:

- a. at the suggestion of the delegate of France it was agreed that the method should be retitled as "Empirical Method for the Determination of Water Content by Loss of Mass on Drying";
- b. at the suggestion of the delegate of the United Kingdom it was agreed that the drying oven should be specified as "well ventilated, capable of being thermostatically controlled to within 2°C and adjusted to operate at 103°C" with consequential textual amendments.

14. The Committee also accepted the suggestions of the delegate of Norway that dishes could be of glass, porcelain or corrosion-proof metal and that the specification for the sand should be in accord with clause 4.6 of FAO/WHO Standard B11 (1970) for the determination of dry matter content in whey cheese. The delegate of IUPAC said it was important that the sand should be capable of absorbing all the fat in the sample and that dishes should be cooled to balance room temperature before weighing. The revised method is set out at Appendix II.

PROPOSED DRAFT STANDARD FOR LOW FAT SPREADS

15. The proposed draft standard (doc. CX/FO 75/7, Add.1&2) was considered at Step 4 of the elaboration procedure with a view to submission to the Commission to circulate as a draft standard.

16. The Committee confirmed that a standard for the product be developed, except that Senegal has some reservations but did not object to development being continued; on the other hand the USA could not agree to a standard being developed at this stage of the development of the product.

17. An attempt was made to reach agreement on the name of the standard but without success. However, it was agreed that for drafting purposes the designation should show Low Fat Spreads with provision for the use of "coined" or "fanciful" names in addition to the Codex designation (see Section 3.1(b) of the Recommended International General Standard for the Labelling of Prepackaged Foods). As several delegations objected to the term "low fat spread" as the name of the product, member countries would be asked to provide a suitable name other than "low fat spread".

18. It was agreed that the Committee's terms of reference precluded any consideration of a standard for a low fat butter spread.

19. The percentages of fats and oils content were discussed. IFMA explained that they had been arrived at on the basis that the product should have a far lower fat content than margarine, and that it was technologically possible to achieve a 39%-41% content. It was generally agreed that the percentages were acceptable with the USA reservation that the fat and oil content should be anything from 39% upwards with declaration of actual fat content.

20. The actual draft was considered in some detail, the main problems arising in connection with the wording of the product definition and the content of the Essential Composition and Quality Factors Section. It was agreed that the product definition should be amended to read "... produced principally from water and from edible fats and oils which are not, or are not mainly derived from milk products". The USA expressed reservations on the inclusion of marine oils in "low fat spreads". As far as the Essential Composition and Quality Factors were concerned there was very general discussion including:

- (a) re-arrangement of paragraphs to show water content first;
- (b) a definition for water;
- (c) exclusion of reference to milk fat content;
- (d) "Additions" to read "Optional Ingredients", etc.

21. It was agreed that these various matters be considered in preparing a revised draft. The Food Additives Section was considered and various additions and modifications suggested. It was agreed that these too should be included in a revised draft with additions being shown in square brackets. Proposers of additions would be asked to produce evidence to justify their inclusion. The delegate of the Federal Republic of Germany expressed reservations about the additive provisions.

22. It was agreed that decisions in relation to the declaration of polyunsaturated fat content should await the report of the ad hoc group of experts on the role of fats and oils in nutrition referred to earlier (para 4). In addition the following matters arose during the discussion:

- (a) a proposal of the Swedish delegate that the level of preservatives should be raised to 2000 mg/kg;
- (b) whether the fat content and/or moisture content ought to be declared on the label;
- (c) declaration of water content when this derives wholly or partly from the use of milk or skimmed milk;
- (d) the Federal Republic of Germany suggestion that the product be labelled "unsuitable for frying";
- (e) Australian proposal that labels should show lot identification, date marking, storage instructions and type of oil used (Account should be taken of the Codex Labelling Committee's guidelines on date marking);
- (f) whether labelling exemptions should be related to surface area of the container rather than the weight (Norway), and the proposal (Sweden) that the exempted weight should be reduced to 25 g.

23. It was finally agreed by the Committee that the proposed draft standard should be re-drafted on similar lines to the existing margarine standard and taking into account the amendments put forward at the meeting (Re-draft at Appendix III) and moved to Step 5 of the Procedure, bearing in mind that comments would be required on the matters referred to in paragraph 22, sub-paragraphs (a) and (f) above.

CONSIDERATION OF REVISED IDENTITY CHARACTERISTICS BASED ON GLC RANGES (CX/FO 75/4, Add.1-3)

24. The Chairman reminded the Committee that its 7th Session had decided that the immediate inclusion of fatty acid composition on a mandatory basis was premature and that ranges of composition were established on the basis that they were typical of bona fide commercial samples.

25. The delegate of the United States referred to their Proposed Method for Use of GLC Fatty Acid Ranges as Identity Criteria for Fats and Oils (CX/FO 75/4, Add.1, Appendix II). The method determines whether or not a sample under inspection fits prescribed fatty acid composition ranges within a specified arbitrary maximum total deviation. Out of 200 samples, 194 had been correctly identified using a 2% deviation level. A number of delegates foresaw difficulties, for example with oils that had been adulterated or that had been unavoidably contaminated to a slight extent with other oils; and also because deviations at low levels of fatty acid composition might have a disproportionately greater effect on the total deviation. Delegates finally agreed that they would try out the method proposed by the USA on commercial samples. The delegate of the USA said he was willing to test by the proposed method results of fatty acid composition submitted to him by member countries.

26. The Committee proceeded to discuss the consolidated Summary of Fatty Acid Ranges as Determined by GLC given in Conference Room Document No. 2. During the course of the discussion the Committee decided against having different sets of ranges to take account of regional differences. As pointed out by Belgium, different ranges would not overcome the problems posed by trade in blends. The table of Fatty Acid Composition of Fats and Oils by GLC as revised by the Committee is given at Appendix V.

Effect on Traditional Criteria

27. The Chairman said little definitive evidence had been received from member countries, but since fatty acid composition data were not mandatory there was no need to proceed further with this aspect at present. This was agreed.

Methods of Analysis

28. The Chairman referred to the definitive texts of IUPAC methods II D19 and II D25 (Appendices I and II of CX/FO 75/4) and the multiplicity of comments thereon received and set out in documents CX/FO 75/4, Add. 2 and 3. Member countries found the methods generally acceptable, but many specific points had been raised and some editing was obviously necessary on the texts as supplied. The delegate of the USA offered to convene a working group of interested organizations (IUPAC, ISO, IDF, IOOC, IASC, AOAC and AOCs) early in 1976 to prepare a final text taking into account comments received by the Committee. The Committee and the representatives of IUPAC, ISO, IASC and IOOC agreed with this suggestion. The Committee expressed their thanks to the USA delegation.

STANDARD FOR OLIVE OIL

29. The Chairman said that at its 7th Session the Committee agreed to consider an alternative method for the determination of tocopherols and methods for the determination of fatty acids in position 2 in the triglycerides and of sterols, for inclusion in the standard for Olive Oils. Replies in response to document CX/FO 75/6 were set out in document CX/FO 75/6, Add.1.

Alternative Method of Analysis for the Determination of Tocopherols

30. The Chairman reported that a collaborative study by IUPAC had not given successful results and IUPAC were currently reviewing the problem.

Methods of Analysis for the Determination of Fatty Acids at Position 2 in the Triglycerides (IUPAC II D27) and of Sterols (IUPAC II C8)

31. Numerous comments had been received on the definitive texts provided by IUPAC. The Chairman suggested they should be collated by the Secretariat and sent to IUPAC for consideration. The representative of IOOC agreed provided this could be done quickly. The representative of IUPAC agreed to expedite this. The Committee agreed to the Chairman's proposal.

PROPOSED DRAFT STANDARD FOR LOW ERUCIC ACID RAPESEED OIL (CX/FO 75/8)

Consideration of Draft Standard at Step 4

32. The Committee considered the need for a new standard, bearing in mind that the proposed new standard differed mainly from the existing standard in respect of its low erucic acid content. Reference was also made to the possible health risk factors that formed an important background to the proposal to develop a standard. In spite of the lack of positive proof of a human health risk many member countries had already taken steps to encourage production of rapeseed oil with a low erucic acid content, some with more success than others.

33. Canada gave a detailed explanation of how they had achieved a considerable drop in erucic acid content over a relatively short period of time. In spite of the apparent trend towards low erucic acid rapeseed oil for food use, as the USA pointed out, there was still a demand for the high erucic acid content oil for non-food purposes. Taking everything into account including the proposed assessment in 1976 of health risks by an FAO/WHO expert group, there was a consensus of opinion in the Committee in favour of the development of a standard, with a number of members having reservations because they thought it premature to do so.

Fatty Acid Composition

34. Having decided that a standard be developed, the Committee considered the question of the percentage of erucic acid it should contain. It proved difficult to agree a definite value because of the varying views on what constituted a realistic level bearing in mind the differing rates at which countries were changing over to low erucic acid rapeseed crops. The position was further complicated by contamination from previous crops. It was eventually agreed that the percentage would be shown in the draft as [15%] and further comments asked for when circulated to member countries and interested organizations. The Committee noted that the tentative 15% level could mean adjustments to the ranges for the two types of oil shown in Conference Room Document No. 2 and other criteria, e.g. Crismer Value. It was agreed that no immediate action could be taken pending a decision on the tentative level.

Sterol Fraction

35. The question of the mandatory inclusion of a brassica-sterol content was considered. Italy thought this would be useful for the identification of rapeseed oil. Brassica-sterol levels were usually between 5%-12% of the total sterol content. There were varying views but the Committee finally decided that brassica-sterol content could usefully contribute to the identification of low erucic acid rapeseed oil and that this should be a qualitative characteristic of not less than 5% brassica-sterol in the total sterols content.

Method of Analysis for Erucic Acid

36. As IUPAC reference methods for determining fatty acid composition were being developed, it was agreed that the question of an appropriate method for erucic acid content be referred to the ad hoc working group that will be convened by the USA (see para 28). Member countries are asked to send comments to the US delegate by the end of the year.

Crismer Value

37. Some delegates doubted the need for inclusion of this criteria in the standard if erucic acid levels were prescribed. It was pointed out that the levels would have to be consistent with eventual decisions on criteria for erucic acid content. The question of whether or not to include Crismer Values was left pending such decisions.

38. Finally the Committee agreed that the standard, as currently drafted, except that the erucic acid content should be shown as 15% in square brackets, should be advanced to Step 5 of the Procedure.

STANDARD FOR LARD

Bömer Value - Proposed Level

39. The Committee considered the comments that had been received on the Portuguese proposal (see para 8 of ALINORM 74/19) that a Bömer value of not less than 72 be included in the Recommended International Standard for Lard (CAC/RS 28-1969). In discussion Finland advised that the written comments they had submitted on commercial lards related to refined lard and thus were not relevant to the Standard. Finland had reservations about the use of the Bömer value because of the considerable variations resulting from different feeding practices. Italy supported by both France and the USA proposed that the Bömer value should not be included. The USA added that modern developments (fatty acids at position 2 and GLC) made the value obsolescent. IUPAC supported these views and referred to the difficulty in obtaining accurate results. After further general discussion the Committee decided that it could not support the Portuguese proposal.

SOLVENT RESIDUES

40. The Committee discussed documents CX/FO 75/10 and CX/FO 75/10 Add.1 which provided further information on the solvents listed in paras 15-18 of the Report of the Seventh Session (ALINORM 74/19). The Chairman noted that a number of countries questioned the inclusion of trichloroethylene, tetrachloroethylene, carbon disulphide, methanol and 2-nitropropane in the Committee's list. He drew attention to the Secretariat Note in CX/FO 75/10 listing the toxicological evaluations so far undertaken by the Joint FAO/WHO Expert Committee on Food Additives on:

ethanol and trichloroethylene (for extracting caffeine) - A1

hexane, heptane, methanol, propan-2-ol and acetone - A2

carbon disulphide - considered but not evaluated.

41. Specifications for identity and purity of extraction solvents including acetone, ethanol, methanol, hexane, heptane, propan-2-ol and trichloroethylene had been formulated by the Joint Expert Committee (FAO Nutrition Meetings Report Series No. 48B) and the Chairman of the Codex Committee on Food Additives had recently asked governments to comment on them (CL 1975/28 dated October 1975).

42. The delegate of the United States reported that 2-nitropropane had been used in that country for about 13 years for the separation of oils into three fractions. Other solvents such as acetone did not give the same results. The residue of 2-nitropropane in finished oils was below 0.5 ppm and probably below 0.1ppm. The US Food and Drug Administration was currently reviewing available information.

43. The Committee accepted that the two chlorinated hydrocarbon solvents were generally used for extraction purposes other than oils and fats (e.g. spices) except trichloroethylene which was used to extract cocoa butter, though this oil was not within the Committee's terms of reference. The Committee also accepted that there was no longer an interest in the use of carbon disulphide. Accordingly the Committee agreed that 1,1,2-trichloroethylene, tetrachloroethylene and carbon disulphide be deleted from the list. Japan drew attention to the fact that hexane and petroleum ether were used in Japan not only as extraction solvents but also as processing solvents. Denmark stated that hexane should be included in the list of processing solvents. The Committee agreed to the following revised list:

Extraction Solvents

Propane
Butane
Hexane
Heptane
Petroleum ether
Naphtha

Processing

Methanol
Ethanol
Propan-2-ol
Acetone
2-nitropropane
Hexane
Petroleum ether

44. The Committee agreed that the list should be forwarded to the Codex Committee on Food Additives for consideration. The Chairman reminded the Committee that the Codex Committee on Food Additives would require member countries to submit specifications of purity, residues found after the use of processing solvents, methods of analysis and toxicological information. In the absence of specifications, Belgium, Federal Republic of Germany, Nigeria and Senegal expressed reservations about the inclusion of naphtha. These delegations and Switzerland, Australia and Italy expressed reservations about the inclusion of 2-nitropropane.

45. The delegate of Italy considered that residue limits should be set now for extraction and processing solvents. The Committee generally agreed to await the opinion of the Codex Committee on Food Additives, given the previous view that residues of extraction solvents after deodorisation would not normally exceed 10 ppm (ALINORM 74/19) and that a decision on limits for residues of processing solvents could not be taken until such information had been submitted to the Codex Committee on Food Additives.

46. The IUPAC representative drew attention to methods prepared under the auspices of the International Association of Seed Crushers, involving flash point determination and gas liquid chromatography capable of detecting levels of solvent residue down to 5 ppm.

DRAFT STANDARDS FOR COCONUT, PALM AND PALM KERNEL OIL

47. The Committee considered the desirability of developing standards for coconut, palm and palm kernel oils on the basis of the content of document CX/FO 75/11 and its appendices of preliminary draft standards; and of supplementary information in CX/FO 75/4 Add. 3.

48. The Chairman pointed out that these were preliminary drafts which needed editing, if it was agreed to proceed further with them.

49. The member countries most concerned, Ghana, Nigeria, and the Ivory Coast, gave further information on the production, trade and technological aspects of the oils. They also pointed out various anomalies and adjustments necessary in any possible redrafting of the preliminary standards.

50. In discussing palm oil the delegates of Senegal, Ghana and Nigeria explained that in their countries the unrefined (virgin) form of the oil was consumed directly; the delegate for the Ivory Coast added that both refined and unrefined forms of the oil were consumed directly in that country. Because of its carotenoid content it was of high nutritional value but could have a high free fatty acid content. Japan, Belgium, Israel, Austria and the United Kingdom stated that in their countries the oil was usually bleached and refined and often processed further and blended for special uses. The Committee decided that a standard should be elaborated for both the red and the bleached forms of the oil, provision being made for carotenoid levels in the red form of the oil and allowance being made for local preferences regarding free fatty acid content of unrefined oils. The delegate of Israel pointed out that refined oils derived from crude oils of high free fatty acid content contain high levels of diglycerides.

51. There was some discussion on a possible need to develop separate standards for coconut oil from the fresh nut and for oil from the dried copra. On information from the delegate of Ghana that the oils differed only in quality characteristics and that these could be altered by refining, the Committee decided to elaborate a single standard for coconut oil. There was no detailed discussion of palm kernel oil other than references to the need to amend the preliminary standard.

52. Finally, the Committee decided that standards for coconut oil (virgin and non-virgin) palm oil (red and bleached) and palm kernel oil (non-virgin) as prepared by the Secretariat with assistance from the United Kingdom Tropical Products Institute should be circulated at Step 3 of the Codex Procedure (Appendices VI, VII, VIII).

CONSIDERATION OF THE NEED FOR ELABORATION OF STANDARDS FOR GRAPSEED AND BABASSU OILS

53. The Committee considered the need for the elaboration of standards for grapeseed and babassu oils taking into account information provided by Spain and Brazil (Appendices I and II to CX/FO 75/12). Argentine and Italy provided further information on grapeseed oils to the Secretariat at the meeting.

54. The general question of international trade in grapeseed oil was discussed. Spain, France, Italy and Argentina referred to limited production for local consumption but the Chairman, referring to retail sales in Belgium, suggested there might be a developing international trade. During the discussion Italy suggested erythrodiol (a diterpenic alcohol constituent of the unsaponifiable fraction) content as a specific identity characteristic for grapeseed oil since fatty acid composition was not particularly useful. After further discussion it was agreed that a standard should be developed for grapeseed oil, and that the Secretariat should provide a preliminary draft standard for circulation at Step 3 of the Procedure (Appendix IX).

55. In the case of babassu oil, Brazil explained that the oil was in fact only traded for human consumption in its refined state, its crude oil being used to manufacture soap. He added that whilst he had not provided production or trade figures, he could in fact do so if required, but added that there was considerable development in the production of the oil in Brazil for domestic consumption and for export to other countries including those in South America. The delegate for the Argentine was in complete agreement with the latter statement. After further discussion it was agreed that a standard should be developed for babassu oil, and that the Secretariat should provide a preliminary draft standard for circulation at Step 3 of the Procedure (Appendix X).

CONSIDERATION OF THE NEED FOR ELABORATION OF A STANDARD FOR MARINE OIL

56. The question of the need to elaborate a standard had come up at the Committee's Seventh Session when the USA had offered to prepare a preliminary standard. In fact the USA had not, at this point of time, been able to produce a draft standard and suitable supporting information (see CX/FO 75/13). However, Canada introduced a statement [Conference Room Document No. 4 (Iodine Value 135-155 amended to 135-195)] which indicated certain possibilities, particularly a suggested new approach to characterizing marine oils. The Canadian paper was discussed; Norway in particular pointed out that it was difficult to separate crude and partly refined oils and doubted whether paragraph 13.3(c) of the document would be applicable in practice.

57. The general need for a standard was discussed in some detail, and some delegates were of the opinion that the use of these oils for direct consumption was limited. Norway pointed to the use of refined marine oils in canned products. The delegation of Argentina pointed out that marine oils were in fact very important raw materials for the production of fractionated, inter-esterified and hydrogenated fats and oils; the oils should be prepared from suitable species of fish that were fresh and fit for human consumption and the oils should not have undergone autoxidation.

58. It was decided that it would be useful to carry out further preliminary work in relation to a possible standard. In introducing the paper Canada offered to coordinate further work, and the USA and Norway offered to assist. It was agreed by the Committee that these members, and any others willing to help, should work on the possibilities with a view to producing a draft standard for the next meeting.

OTHER BUSINESS

59. The Chairman introduced Conference Paper 1 on matters arising from the Report on the Committee's 7th Session and asked if delegates had any comments. Considerable reservations were expressed about sub-paragraphs (a), (b) and (c) of paragraph 5 on the Health Implications of Erucic Acid Content of Rapeseed Oil (See Appendix XII). In particular Canada and others had the following specific comments on the sub-paragraph:

- (a) The information reported was not from "very recent studies". At best, 1973-74 opinions were expressed.
- (b) "Rapeseed oil containing zero erucic acid" did not exist.
- (c) The species of animal was not identified and this must be done when the results of feeding trials on toxicological studies were reported. Similarly, diets and length of experiment must be stated.
- (d) Current data suggested strongly that erucic acid was the cause of the lesions observed when rapeseed oil was fed to rats at a high level of calories in the diet. However, when the rapeseed oil contained low levels of erucic acid the lesions formed were indistinguishable from those induced in control animals.

In addition, members present wished to have it recorded that their countries would welcome the opportunity of contributing information to the WHO/FAO ad hoc group of experts on fats and oils in human nutrition.

60. The USA drew attention to the reference about their acceptance of standards in paragraph 7 of Conference Paper 1. They pointed out that the formulation of legislation covering lard and rendered pork fat was in an advanced stage. They added that they had in fact decided to make a single regulation covering both products, which was in fact contrary to their earlier support at Committee Meetings for the development of two standards. They suggested that in due course it might be necessary to revise the standards concerned. The Chairman agreed but made it clear to the Committee that at this present time there were no plans for a revision of the standards programme.

DATE AND PLACE OF THE NEXT SESSION

61. The Committee was informed that the date for the next session had not yet been decided and would be communicated after consultation between the United Kingdom Authorities and the Codex Alimentarius Secretariat in Rome.

SUMMARY STATUS OF WORK

Standard	Step	To be dealt with by	Document
General Standard for Fats and Oils not covered by individual standards ^{1/}	9	Governments	CAC/RS 19-1969
Edible Soya Bean Oil	9	"	CAC/RS 29-1969
Edible Arachis Oil	9	"	CAC/RS 21-1969
Edible Cottonseed Oil	9	"	CAC/RS 22-1969
Edible Sunflowerseed Oil	9	"	CAC/RS 23-1969
Edible Rapeseed Oil	9	"	CAC/RS 24-1969
Edible Maize Oil	9	"	CAC/RS 25-1969
Edible Sesameseed Oil	9	"	CAC/RS 26-1969
Edible Safflowerseed Oil	9	"	CAC/RS 27-1969
Lard	9	"	CAC/RS 28-1969
Rendered Pork Fat	9	"	CAC/RS 29-1969
Premier Jus	9	"	CAC/RS 30-1969
Edible Tallow	9	"	CAC/RS 31-1969
Margarine	9	"	CAC/RS 32-1969
Olive Oil	9	"	CAC/RS 33-1970
Mustardseed Oil	9	"	CAC/RS 34-1970
Low Fat Spreads	5	11th CAC	ALINORM 76/19, III
Edible Low Erucic Acid Rapeseed Oil	5	11th CAC	ALINORM 76/19, XIII
Edible Coconut Oil	3	9th FO	ALINORM 76/19, VI
Edible Red Palm Oil and Edible Bleached Palm Oil	3	9th FO	ALINORM 76/19, VII
Edible Palm Kernel Oil	3	9th FO	ALINORM 76/19, VIII
Edible Grapeseed Oil	3	9th FO	ALINORM 76/19, IX
Edible Babassu Oil	3	9th FO	ALINORM 76/19, X

^{1/} See paragraph 9.

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APPENDIX I

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GENERAL STANDARD FOR MARGARINE

EMPIRICAL METHOD FOR THE DETERMINATION OF WATER CONTENT BY LOSS OF MASS ON DRYING

1. SCOPE

This standard describes an empirical reference method for the determination of the water content of margarine.

2. DEFINITION

The water content of margarine is defined as the loss of mass, expressed as percentage by mass, as determined by the procedure described under 7.2.

3. PRINCIPLE OF THE METHOD

The water content is determined gravimetrically by drying a known quantity of margarine at $103^{\circ}\text{C} \pm 2^{\circ}\text{C}$ in the presence of sand.

4. APPARATUS

4.1 Analytical Balance

4.2 Drying oven, well ventilated, capable of being thermostatically controlled to within 2°C and adjusted to operate at 103°C .

4.3 Flat bottomed glass, porcelain or corrosion-proof metal dishes in diameter 60-80 mm and at least 25 mm high.

4.4 A glass rod of such a length as to prevent it from falling into the sand and melted margarine.

4.5 Desiccator: provided with efficient drying agent (e.g. silica gel with hygrometric indicator).

5. REAGENT

Sand: Quartz sand or sea sand which passes through a sieve with 10 openings per cm but not through a sieve with 40 openings per cm (e.g. woven wire cloth test sieve with nominal size of aperture of 500 μm and of 180 μm respectively; see ISO Recommendation R 565), if necessary washed with hot concentrated hydrochloric acid and water, dried and ignited.

6. SAMPLING

Carry out the sampling by the method described in The representative sample shall weigh not less than 100 g.

7. PROCEDURE

7.1 Preparation of the sample. Mix the sample by means of a stirrer as quickly as possible, preferably at a temperature between 18°C and 24°C , but under no circumstances exceeding 35°C .

7.2 Determination of water content

7.2.1 Weigh into the dish about 25 to 30 g sea sand or quartz sand (5) and place the glass rod in the dish. Dry the dish (4.3) in the oven (4.2) at $103^{\circ}\text{C} \pm 2^{\circ}\text{C}$ until constant mass.

7.2.2 Allow the dish to cool to the temperature of the balance room (30-35 minutes) and weigh to the nearest 1 mg.

7.2.3 Weigh into the dish, between 5 and 7 g of the sample to an accuracy of 1 mg. Do not stir.

7.2.4 Place the dish in the oven for one and a half hours at $103^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

7.2.5 Allow the dish to cool in the desiccator to the temperature of the balance room (30-35 minutes) and weigh to the nearest 1 mg.

7.2.6 Stir the mass and repeat the drying by placing the dish in the oven for 30 minutes at $103^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Allow to cool in the desiccator and weigh. Repeat the process to constant mass (within 1.5 mg). In the event of an increase in mass, the lowest mass is taken for the calculation.

8. EXPRESSION OF RESULTS

8.1 Method of calculation of the water content

The percentage by mass of water content is equal to:

$$\frac{m_1 - m}{m_1} \times 100$$

where:

m_1 = mass, in grammes of test portion

m = mass, in grammes of test portion after drying

8.2 Repeatability

The difference between results of two determinations carried out simultaneously or in rapid succession by the same analyst should not exceed 0.1% of the product.

- - - -

APPENDIX III

PROPOSED DRAFT STANDARD FOR "LOW FAT SPREADS"
(at Step 5 of the Codex Procedure)

1. SCOPE

This standard does not apply to any product which contains less than 39% fat or more than 41% fat and is not labelled in any manner which implies either directly or indirectly that the product is a low fat spread.

2. DESCRIPTION

2.1 Product Definition

"Low fat spread" is a food in the form of a spreadable emulsion, which is mainly of the type water/oil, produced principally from water and edible fats and oils which are not or are not mainly derived from milk.

2.2 Other Definitions

2.2.1 Edible fats and oils means foodstuffs composed of glycerides of fatty acids of vegetable, animal or marine origin. Fats of animal origin must be produced from animals in good health at the time of slaughter and be fit for human consumption as determined by a competent authority recognized in national legislation. 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.

2.2.2 Pre-packed means packed or made up in advance, ready for retail sale in a container.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw Materials

3.1.1 Water - Water may be derived from milk whey or skimmed milk]

[(alternatively: water as such and/or water derived from milk or skimmed milk)].

3.1.2 Edible fats and/or oils, or mixtures of these, whether or not they have been subjected to a process of modification.

3.2 Fat Content not less than 39% m/m and not more than 41% m/m

3.3 Water Content not less than 50% m/m

3.4 Milk Fat Content not more than 1% m/m if milk products are used]

3.5 Optional Ingredients

The following substances may be added:

- 3.5.1 Vitamins: Vitamin A and its esters
Vitamin D
Vitamin E and its esters
Other Vitamins

Maximum and minimum levels for Vitamins A, D and E and other Vitamins should be laid down by national legislation in accordance with the needs of each individual country including, where appropriate, the prohibition of the use of particular vitamins.

- 3.5.2 Egg yolk
- 3.5.3 Sodium chloride
- 3.5.4 Sugars 1/
- 3.5.5 Suitable edible proteins
- 3.5.6 [Other suitable milk products, except concentrated forms of milk fat/
Alternatively: Dried milk, dried skimmed milk, whey and dried whey]

4. FOOD ADDITIVES

The following provisions in respect of food additives are subject to endorsement by the Codex Committee on Food Additives. The following substances may be added singly or in combination:

- | <u>4.1 Colours</u> | <u>Maximum level of use</u> |
|--|--|
| 4.1.1 Alpha-, Beta-, Gamma-carotenes | } Limited by GMP |
| 4.1.2 Bixin, Norbixin, Annatto | |
| 4.1.3 Turmeric, Curcumin | |
| <u>4.2 Flavours</u> | |
| 4.2.1 Natural flavours as defined in the Codex Alimentarius and their identical synthetic equivalents | } Limited by GMP |
| 4.2.2 Other synthetic flavours approved by the Codex Alimentarius Commission | |
| <u>4.3 Emulsifiers</u> | |
| 4.3.1 Lecithins | } Limited by GMP |
| 4.3.2 Mono- and diglycerides of fatty acids | |
| 4.3.3 Polyglycerol esters of fatty acids | |
| 4.3.4 Polyglycerol esters of interesterified ricinoleic acid | |
| 4.3.5 Esters of fatty acids with polyalcohols other than glycerol:
Sorbitan monopalmitate
Sorbitan monostearate
Sorbitan tristearate
Polyoxyethylene (20) sorbitan monolaurate
Polyoxyethylene (20) sorbitan monopalmitate
Polyoxyethylene (20) sorbitan monostearate
Polyoxyethylene (20) sorbitan tristearate
Polyoxyethylene (20) sorbitan monooleate | |
| <u>4.4 Thickening Agents</u> | |
| 4.4.1 Pectins | } 10 g/kg individually or in combination |
| 4.4.2 Agar-agar | |
| 4.4.3 Carrageenan | |
| 4.4.4 Guar gum | |
| 4.4.5 Locust bean gum | |
| 4.4.6 Tragacanth gum | |

1/ "Sugars" means any carbohydrate sweetening matter.

	<u>Maximum level of use</u>
4.4.7 Xanthan gum	} 10 g/kg individually or in combination
4.4.8 Gelatine	
4.4.9 Methyl cellulose	
4.4.10 Carboxymethyl cellulose and its sodium salt	
4.4.11 Sodium, potassium, calcium and ammonium alginates	
4.4.12 Propylene glycol alginate	
4.4.13 Natural Starches	Limited by GMP
4.5 <u>Preservatives</u>	
4.5.1 Sorbic acid and its sodium, potassium and calcium salts	} 1000 mg/kg individually or in combination
4.5.2 Benzoic acid and its sodium and potassium salts	
4.6 <u>Antioxidants</u>	
4.6.1 Propyl, Octyl, and Dodecyl gallates	} 100 mg/kg of the fat content individually or in combination
4.6.2 Butylated hydroxytoluene (BHT)	
4.6.3 Butylated hydroxyanisole (BHA)	
4.6.4 Ascorbyl palmitate/stearate	500 mg/kg of the fat content
4.6.5 L-ascorbic acid	300 mg/kg of the fat content
4.6.6 Natural and synthetic tocopherols	Limited by GMP
4.7 <u>Antioxidants Synergist</u>	
4.7.1 Calcium disodium salt of EDTA	75 mg/kg]
4.8 <u>pH Correcting Agents</u>	
4.8.1 Lactic acid	} Limited by GMP
4.8.2 Citric acid	
4.8.3 Sodium hydrogen carbonate	
4.8.4 Sodium carbonate	
4.8.5 Sodium hydroxide	
4.8.6 Sodium monophosphates (orthophosphates)]]
5. <u>CONTAMINANTS</u>	<u>Maximum level</u>
5.1 Iron (Fe)	1.5 mg/kg
5.2 Copper (Cu)	0.1 mg/kg
5.3 Lead (Pb)	0.1 mg/kg
5.4 Arsenic (As)	0.1 mg/kg
6. <u>HYGIENE</u>	

It is recommended that the product covered by the provisions of this standard be prepared in accordance with the appropriate Sections of the General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (Ref. No. CAC/RCP 1-1969).

7. PACKAGING

"Low fat spread", when sold by retail, shall be prepacked and may be sold in a pack of any shape.

8. LABELLING

In addition to Sections 1, 2, 4 and 6 of the General Standard for the Labelling of Pre-packaged Foods (Ref. No. CAC/RS 1-1969), the following specific provisions apply:

8.1 The Name of the Food

The product shall be designated "Low Fat Spread" and all products designated as "Low Fat Spread" shall conform to this standard.

A "coined" or "fanciful" name may be used provided it is not misleading and is accompanied by the above designation.

8.2 List of Ingredients

A complete list of ingredients shall be declared on the label in descending order of proportion in accordance with sub-section 3.2(c) of the General Standard for the Labelling of Prepackaged Foods.

8.3 Net Contents

The net contents shall be declared by weight either in the metric ("Système international" units) or avoirdupois or both systems as required by the country in which the product is sold.

8.4 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared.

8.5 Country of Origin

The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

8.6 Exemptions

The information specified under 8.2, 8.3, 8.4 and 8.5 need only be given on the outer cartons containing "low fat spread" packed in units less than 50 g.

8.7 Labelling Prohibitions

8.7.1 No reference shall be made on the label or pack to the presence of milk and/or dairy products except in a complete list of ingredients.

8.7.2 No reference shall be made other than in a complete list of ingredients to the presence of any vitamin in "low fat spread" unless the name and quantity of the vitamin is stated on the label.

9. METHODS OF ANALYSIS AND SAMPLING

To be developed.

APPENDIX IV

PROPOSED DRAFT GENERAL STANDARD FOR EDIBLE FATS AND OILS NOT COVERED BY INDIVIDUAL CODEX STANDARDS (Revised text at Step 3 of the Codex Procedure) 1/

1. SCOPE

This standard applies to edible oils and fats and mixtures thereof which are used for direct consumption either in domestic or commercial catering or used in the manufacture of food products. It covers oils and fats that have been subjected to processes of modification but does not include oils and fats which must be subjected to further processing in order to render them suitable for human consumption. This standard does not apply to any oil or fat which is the subject of a specific Codex commodity standard and is designated by a specific name laid down in such standards.]

2. DESCRIPTIONS

2.1 Edible Fats and Oils means those foodstuffs defined in provision 1 and which are composed of glycerides of fatty acids of vegetable, animal or marine origin. Fats of animal origin must be produced from animals in good health at the time of slaughter and be fit for human consumption as determined by a competent authority recognized in national legislation. 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.

2.2 Virgin Fats and Oils means edible fats and oils obtained by mechanical procedures and the application of heat only. They may have been purified by washing with water, settling, filtering and centrifuging only.]

1/ See paragraph 10 of the Report.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw Materials

Edible fats and/or oils or mixtures thereof.

3.2 Colour

Characteristic of the designated product.

3.3 Odour and Taste

Characteristic of the designated product and free from foreign and rancid odour and taste.

3.4 Acid Value

Virgin fats and oils	not more than 4 mg KOH/g fat or oil
Non-virgin fats and oils	not more than 0.6 mg KOH/g fat or oil

3.5 Peroxide Value not more than 10 milliequivalents of peroxide oxygen/kg fat or oil.

4. FOOD ADDITIVES PERMITTED IN ALL FATS AND OILS COVERED BY THE STANDARD

4.1 Colours

The following colours are permitted for the purpose of restoring natural colour lost in processing or for the purpose of standardizing colour, as long as the added colour does not deceive or mislead the consumer by concealing damage or inferiority or by making the product appear to be of greater than actual value:

	<u>Maximum level of use</u>
4.1.1 Beta-carotene	Not limited
4.1.2 Annatto*	Not limited
4.1.3 Curcumin*	Not limited
4.1.4 Canthaxanthine	Not limited
4.1.5 Beta-apo-8'-carotenal	Not limited
4.1.6 Methyl and ethyl esters of beta-apo-8'-carotenoic acid	Not limited

4.2 Flavours

Natural flavours and their identical synthetic equivalents, except those which are known to represent a toxic hazard, and other synthetic flavours approved by the Codex Alimentarius Commission are permitted for the purpose of restoring natural flavour lost in processing or for the purpose of standardizing flavour, as long as the added flavour does not deceive or mislead the consumer by concealing damage or inferiority or by making the product appear to be of greater than actual value.*

4.3 Antioxidants

4.3.1 Propyl, octyl, and dodecyl gallates	100 mg/kg individually or in combination
4.3.2 Butylated hydroxytoluene (BHT) Butylated hydroxyanisole (BHA) [4-Hydroxymethyl-2, 6-diterbutylphenol]	200 mg/kg individually or in combination
4.3.3 Any combination of gallates with BHA or BHT, or both	200 mg/kg, but gallates not to exceed 100 mg/kg
4.3.4 Natural and Synthetic tocopherols	Not limited
4.3.5 Ascorbyl palmitate)	500 mg/kg individually 1/ or in combination
4.3.6 Ascorbyl stearate)	
4.3.7 Dilauryl thiodipropionate	200 mg/kg

4.4 Antioxidant Synergists

	<u>Maximum level of use</u>
4.4.1 Citric acid and its sodium salt	Not limited
4.4.2 Isopropyl citrate mixture	100 mg/kg individually or in combination
4.4.3 Phosphoric acid*	

* Temporarily endorsed.

1/ See Appendix XI.

4.5	<u>Anti-foaming Agent</u>	<u>Maximum level of use</u>
	Dimethyl polysiloxane (dimethyl silicone) singly) or in combination with silicone dioxide* }	10 mg/kg
4.6	<u>Crystallization Inhibitor</u>	
	Oxystearin*	1250 mg/kg
5.	<u>FOOD ADDITIVES PERMITTED ONLY IN FATS AND OILS GOING TO FORM PART OF THE INGREDIENTS OF MANUFACTURED FOODS</u>	
5.1	<u>Emulsifiers</u>	
	<u>The following are permitted but only in fats and oils not specifically designated with the name of the plant or animal from which they originate:</u>	<u>Maximum level of use</u>
5.1.1	Mono- and diglycerides of fatty acids	Not limited
5.1.2	Mono- and diglycerides of fatty acids esterified with the following acids: acetic acetyltartaric citric lactic tartaric and their sodium and calcium salts	20 g/kg of the emulsifiers specified under 5.1.2 to 5.1.14 inclusive, individually or in combination
5.1.3	Lecithins and components of commercial lecithin	
5.1.4	Polyglycerol esters of fatty acids	
5.1.5	Esters of fatty acids with polyalcohols other than glycerol: Sorbitan monopalmitate Sorbitan monostearate Sorbitan tristearate	
5.1.6	1,2 propylene glycol esters of fatty acids	
5.1.7	Sucrose esters of fatty acids (including sucroglycerides)*	
5.1.8	Stearoyl lactic acid and its calcium salt*	
5.1.9	Polyglycerol esters of interesterified ricinoleic acid*	
5.1.10	Polyoxyethylene (20) sorbitan monostearate	
5.1.11	Polyoxyethylene (20) sorbitan mono-oleate	
5.1.12	Stearoyl propylene glycol hydrogen succinate	
5.1.13	Stearyl monoglyceridyl citrate	
5.1.14	Succinylated monoglycerides	
6.	<u>CONTAMINANTS</u>	
6.1	Matter volatile at 105°C	0.2% m/m
6.2	Insoluble impurities	0.05% m/m
6.3	Soap content	0.005% m/m
6.4	Iron (Fe) Virgin Oil	5 mg/kg
	Non-virgin Oil	1.5 mg/kg
6.5	Copper (Cu) Virgin Oil	0.4 mg/kg
	Non-virgin Oil	0.1 mg/kg
6.6	Lead (Pb)	0.1 mg/kg
6.7	Arsenic (As)	0.1 mg/kg
7.	<u>HYGIENE</u>	

It is recommended that the product covered by the provisions of this standard be prepared in accordance with the appropriate Sections of the General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (Ref. No. CAC/RCP 1-1969).

* Temporarily endorsed.

8. LABELLING

In addition to Sections 1, 2, 4 and 6 of the General Standard for the Labelling of Prepackaged Foods (Ref. No. CAC/RS 1-1969) the following specific provisions apply:

8.1 The Name of the Food

8.1.1 The name designated for the product conforming to the definition at 2.1 of the standard shall be such as to give a true indication of the nature of the fat or oil, and not to mislead the consumer. Names such as edible oil and salad oil which do not indicate a plant or animal source may be used without further qualification. [The presence of additives other than those included in provision 4 must be included in the name of the product.]

8.1.2 Where an oil has been subject to any process of esterification or to processing which alters its fatty acid composition or its consistency the specific name of the oil shall not be used unless qualified to indicate the nature of the process.

8.1.3 The designation virgin fat or virgin oil may only be used for individual fats or oils conforming to the definition at 2.2 of this standard.

8.2 List of Ingredients

8.2.1 A complete list of ingredients shall be declared on the label in descending order of proportion.

8.2.2 A specific name shall be used for ingredients in the list of ingredients except that class titles may be used in accordance with sub-section 3.2(c)(ii) of the General Standard for the Labelling of Prepackaged Foods.

8.3 Net Contents

The net contents shall be declared in accordance with sub-section 3.3(a) of the General Standard for the Labelling of Prepackaged Foods.

8.4 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared.

8.5 Country of Origin

8.5.1 The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

8.5.2 When the product undergoes processing in a second country which changes its nature, the country in which the processing is performed shall be considered to be the country of origin for the purposes of labelling.

9. METHODS OF ANALYSIS AND SAMPLING

The methods of analysis and sampling referred to hereunder are international referee methods.

9.1 Determination of Acid Value (I_A)

According to the IUPAC (1964) method (IUPAC Standard Methods for the analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.1.2 Acid Value).

Results are expressed as the number of mg KOH required to neutralize 1 g oil or fat.

9.2 Determination of Peroxide Value (I_p)

According to the IUPAC (1964) method (IUPAC Standard Methods for the analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.13 Peroxide Value).

Results are expressed as milliequivalents active oxygen/kg fat or oil.

9.3 Determination of Matter Volatile at 105°C

According to the IUPAC (1964) method (IUPAC Standard Methods for the analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.C.1.1 Moisture and Volatile Matter).

Results are expressed as % m/m.

FATTY ACID COMPOSITION OF FATS AND OILS BY GLC

(See paragraph 22 of this Report)

RANGES REFER TO TYPICAL COMMERCIAL SAMPLES OF BONA FIDE FATS AND OILS

FATTY ACID	ARACHIS	COTTON-SEED	LARD AND RENDERED PORK FAT	MAIZE	MUSTARD-SEED	PREMIER JUS AND EDIBLE TALLOW	SAFFLOWER-SEED	SESAME-SEED	SOYABEAN	SUNFLOWER-SEED
C <14	<0.4	<0.1	<0.5	<0.1	<0.5	<2.5	<0.1	<0.1	<0.1	<0.4
C 14:0	<0.6	0.4-2.0	0.5-2.5	<0.1	<1.0	1.4-7.8	<1.0	<0.5	<0.5	<0.5
C 14:ISO						<0.3				
C 14:1			<0.2			0.5-1.5				
C 15:0			<0.1			0.5-1.0				
C 15:ISO			<0.1			<1.5				
C15:ANTI ISO						<1.5				
C 16:0	6.0-15.5	17-31	20-32	8.0-19	0.5-4.5	17-37	2.0-10	7.0-12	7.0-13.4	3.0-10
C 16:1	<1.0	0.5-2.0	1.7-5.0	<0.5	<0.5	0.7-8.8	<0.5	<0.5	<0.5	<1.0
C 16:2						<1.0				
C 16:ISO			<0.1			<0.5				
C 17:0	<0.1		<0.5			0.5-2.0				
C 17:1	<0.1		<0.5			<1.0				
C 17:ISO										
C17:ANTI ISO						<1.5				
C 18:0	1.3-6.5	1.0-4.0	5.0-24	0.5-4.0	0.5-2.0	6.0-40	1.0-10	3.5-6.0	1.4-5.5	1.0-10
C 18:1	35-72	13-44	35-62	19-50	8.0-23	26-50	7.0-42	35-50	19-30	14-65
C 18:2	13-45	33-59	3.0-16	34-62	10-24	0.5-5.0	55-81	35-50	48-61.5	20-75
C 18:3	<1.0	0.1-2.1	<1.5	<2.0	6.0-18	<2.5	<1.0	<1.0	4-10.7	<0.7
C 20:0	1.0-3.0	<0.7	<1.0	<1.0	<1.5	<0.5	<0.5	<1.0	<1.0	<1.5
C 20:1	0.5-2.1	<0.5	<1.0	<0.5	5.0-13	<0.5	<0.5	<0.5	<1.0	<0.5
C 20:2			<1.0		<1.0					
C 20:4			<1.0			<0.5				
C 22:0	1.0-5.0	<0.5	<0.1	<0.5	0.2-2.5		<0.5	<0.5	<0.5	<1.0
C 22:1	<2.0	<0.5			22-50					<0.5
C 22:2					<1.0					
C 24:0	0.5-3.0	<0.5		<0.5	<0.5					<0.5
C 24:1					0.5-2.5					<0.5

Note: Blank spaces indicate that the fatty acid is not normally present.

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APPENDIX VI

PROPOSED DRAFT INTERNATIONAL STANDARD FOR EDIBLE COCONUT OIL
(at Step 3 of the Codex Procedure)

1. DESCRIPTION

Coconut Oil is derived from the kernel of the coconut (Cocos nucifera)

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Identity Characteristics

2.1.1	Relative Density (30°C/water at 30°C)	0.915 - 0.927
2.1.2	Refractive Index (n_D 40°C)	1.448 - 1.450
2.1.3	Saponification Value (mg KOH/g oil)	248 - 264
2.1.4	Iodine Value (Wijs)	7 - 11
2.1.5	Unsaponifiable matter	not more than 8 g/kg

2.1.6 Guideline Fatty acid composition (%) based on GLC

C 6:0	0 - 0.8
C 8:0	5.4 - 9.5
C 10:0	4.5 - 9.7
C 12:0	44.1 - 51.3
C 14:0	13.1 - 18.5
C 16:0	7.5 - 10.5
C 18:0	1.0 - 3.7
C 18:1	5.0 - 8.2
C 18:2	1.0 - 2.6

2.2 Quality Characteristics

2.2.1 Colour: Characteristic of the designated product.

2.2.2 Odour and taste: Characteristic of the designated product and free from foreign and rancid odour and taste.

2.2.3 Acid Value:

Virgin oil	not more than 3 mg KOH/g [or according to local preference]
Non-virgin oil	not more than 0.6 g KOH/g

2.2.4 Peroxide Value not more than 10 milliequivalents peroxide oxygen/kg oil

3. FOOD ADDITIVES) In conformity with the Recommended International Standards
4. CONTAMINANTS) for other vegetable oils (except delete crystallization
inhibitor from Food Additives provisions).

5. HYGIENE " " " " " "

6. LABELLING " " " " " "

7. METHODS OF ANALYSIS)
AND SAMPLING) " " " " " "

PROPOSED DRAFT INTERNATIONAL STANDARD FOR EDIBLE RED PALM OIL
AND EDIBLE BLEACHED PALM OIL
(At Step 3 of the Codex Procedure)

1. DESCRIPTION

Palm Oil is derived from the fleshy mesocarp of the fruit of the oil palm (Elaeis Guineensis).

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Identity Characteristics

2.1.1	Relative density (40°C/water at 25°C)	0.900 - 0.907
2.1.2	Refractive Index (n_D 50°C)	1.45 - 1.46
2.1.3	Saponification Value (mg KOH/g oil)	190 - 209
2.1.4	Iodine Value (Wijs)	46 - 56
2.1.5	Unsaponifiable matter	not more than 20 g/kg
2.1.6	Guideline Fatty acid composition(%) based on GLC	
	C 12:0	0 - 0.5
	C 14:0	0.5 - 5.9
	C 16:0	32.0 - 51.0
	C 16:1	0 - 0.6
	C 18:0	1.5 - 8.0
	C 18:1	34.6 - 52.0
	C 18:2	5.0 - 11.8
	C 18:3	0 - 0.6]

2.2 Quality Characteristics

2.2.1 Colour: Characteristic of the designated product.

2.2.2 Odour and taste: Characteristic of the designated product and free from foreign and rancid odour and taste.

2.2.3 Acid Value:

Virgin oil not more than 10 mg KOH/g [or according to local preference].
 Non-virgin oil not more than 0.6 mg KOH/g

2.2.4 Peroxide Value not more than 10 milliequivalents peroxide oxygen/kg oil.

2.2.5 Total Carotenoids for Red Palm Oil not less than 500 mg/kg and not more than 1600 mg/kg.

3. FOOD ADDITIVES

4. CONTAMINANTS

5. HYGIENE

6. LABELLING

7. METHODS OF ANALYSIS
AND SAMPLING

In conformity with the Recommended International Standards for other vegetable oils (except delete crystallization inhibitor from Food Additives provisions).

"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"

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APPENDIX VIII

PROPOSED DRAFT INTERNATIONAL STANDARD FOR EDIBLE PALM KERNEL OIL
(At Step 3 of the Codex Procedure)

1. DESCRIPTION

Palm Kernel Oil is derived from the kernel of the fruit of the oil palm (Elaeis Guineensis).

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Identity Characteristics

2.1.1	Relative density (40°C/water at 25°C)	0.900 - 0.915
2.1.2	Refractive Index (n_D 40°C)	1.449 - 1.451
2.1.3	Saponification Value (mg KOH/g oil)	230 - 254
2.1.4	Iodine value (Wijs)	13 - 23
2.1.5	Unsaponifiable matter	not more than 10 g/kg

2.1.6 Guideline Fatty acid composition (%) based on GLC

C 8:0	2.4 - 4.5
C 10:0	3.0 - 7.0
C 12:0	44.5 - 52.0
C 14:0	14.1 - 18.6
C 16:0	6.5 - 10.4
C 18:0	1.3 - 3.5
C 18:1	10.5 - 18.5
C 18:2	0.7 - 2.5]

2.2 Quality Characteristics

2.2.1 Colour: Characteristic of the designated product.

2.2.2 Odour and taste: Characteristic of the designated product and free from foreign and rancid odour and taste.

2.2.3 Acid Value:

(Non-virgin oil) not more than 0.6 mg KOH/g oil

2.2.4 Peroxide Value not more than 10 milliequivalents peroxide oxygen/kg oil.

3. FOOD ADDITIVES	} In conformity with the Recommended International Standards for other vegetable oils (except delete crystallization inhibitor from Food Additives provisions)
4. CONTAMINANTS	
5. HYGIENE	
6. LABELLING	
7. METHODS OF ANALYSIS AND SAMPLING	

PROPOSED DRAFT INTERNATIONAL STANDARD FOR EDIBLE GRAPESEED OIL
(At Step 3 of the Codex Procedure)

1. DESCRIPTION

Grapeseed oil is derived from the seeds of the grape (Vitis vinifera).

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Identity Characteristics

2.1.1	Relative density (20°C/water at 20°C)	0.923 - 0.926
2.1.2	Refractive Index (n_D 25°C)	1.473 - 1.477
2.1.3	Saponification Value (mg KOH/g oil)	188 - 194
2.1.4	Iodine Value (Wijs)	130 - 138
2.1.5	Unsaponifiable matter	not more than 20 g/kg
2.1.6	Erythrodiol content of sterol content	not less than 20 g/kg
2.1.6	Guideline fatty acid composition (%) based on GLC	
	<C 14:0	<0.1
	C 14:0	<0.3
	C 16:0	6.5 - 10.0
	C 16:1	<1.2
	C 18:0	3 - 6
	C 18:1	12 - 25
	C 18:2	60 - 78
	C 18:3	<1.0
	C 20:0	<1.0

2.2 Quality Characteristics

3. FOOD ADDITIVES

4. CONTAMINANTS

5. HYGIENE

6. LABELLING

7. METHODS OF ANALYSIS AND SAMPLING

} In conformity with the Recommended International Standards for other vegetable oils (Acid Value for non-virgin oil only)
(Method to be developed for erythrodiol content)

APPENDIX X

PROPOSED DRAFT INTERNATIONAL STANDARD FOR EDIBLE BABASSU OIL
(At Step 3 of the Codex Procedure)

1. DESCRIPTION

Babassu oil is derived from the kernel of the fruit of several varieties of the palm Attalea funifera.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Identity Characteristics

2.1.1	Relative density (25°C/water at 25°C)	0.915 - 0.918
2.1.2	Refractive Index (n_D 40°C)	1.448 - 1.451
2.1.3	Saponification Value (mg KOH/g oil)	247 - 255
2.1.4	Iodine Value (Wijs)	10 - 18
2.1.5	Unsaponifiable matter	not more than 12 g/kg
2.1.6	Guideline Fatty acid composition (%) based on GLC	
	C 8:0	4 - 7.3
	C 10:0	1.2 - 7.6
	C 12:0	40 - 55
	C 14:0	11.6 - 17.4
	C 16:0	5.2 - 10.8
	C 18:0	1.8 - 5.5
	C 18:1	9.0 - 19.2
	C 18:2	1.4 - 6.6

APPENDIX X (Cont.)

2.2 Quality Characteristics

2.2.1 Colour: Characteristic of the designated product.

2.2.2 Odour and taste: Characteristic of the designated product and free from foreign and rancid odour and taste.

2.2.3 Acid Value:

Non-virgin oil not more than 0.6 mg KOH/g

2.2.4 Peroxide Value not more than 10 milliequivalents peroxide oxygen/kg oil.

- | | |
|-------------------------------------|--|
| 3. FOOD ADDITIVES | } In conformity with the Recommended International Standards for other vegetable oils (except delete crystallization inhibitor from Food Additives provisions) |
| 4. CONTAMINANTS | |
| 5. HYGIENE | |
| 6. LABELLING | |
| 7. METHODS OF ANALYSIS AND SAMPLING | |

APPENDIX XI

STATEMENT SUBMITTED BY SWITZERLAND ON THE OPTIMUM EFFECTIVE LEVEL FOR THE ANTIOXIDANT ASCORBYL PALMITATE

Comparative trials with 200 and 500 ppm of Ascorbylpalmitate (AP) - 11th April 1975 by G. Pongraoz (unpublished data)

In the various FAO/WHO Recommended International Standards for Edible Fats and Oils as well as in the respective Standard for Margarine, the maximum permissible level for ascorbyl palmitate (AP) as an antioxidant has been fixed at 200 mg per kg. .

Various tests which have meanwhile been carried out have shown that the antioxidative effect of AP largely depends on the level of AP. Higher amounts of AP provide better protection of the oils and fats against oxidative deterioration. Taking into account the various factors (effectiveness, solubility, economical aspect), it seems that the optimum concentration lies at around 500 ppm. It is therefore suggested that the actual provision in the respective standards be changed by increasing the permitted level from 200 ppm to 500 ppm.

The results of the following stability tests clearly demonstrate that the above-mentioned proposal is, from the technological point of view, absolutely justified.

The stability tests were carried out with four edible fats (peanut oil, sunflowerseed oil, soyabean oil and lard) at two temperatures (65°C and 80°C) with the following stabilizers:

- (1) Control (no stabilizers)
- (2) 200 ppm AP
- (3) 500 ppm AP
- (4) Mixture of 200 ppm AP, 40 ppm α -tocopherol, 560 lecithin
- (5) Mixture of 500 ppm AP, 100 ppm α -tocopherol, 1400 ppm lecithin.

Results of Stability Trials

Stabilizer No.	PEROXIDE NUMBER after X days of storage											
	Peanut Oil, 80°C			Sunflowerseed Oil, 65°C			Soyabean Oil, 65°C			Lard, 80°C		
	3 days	4 days	5 days	3 days	4 days	5 days	3 days	4 days	5 days	3 days	4 days	5 days
1 (Control)	68.0	>400	>400	101.5	306.0	>400	96.0	187.5	330.4	>400	-	-
2 (200 AP)	37.6	85.6	>400	42.2	86.0	>400	3.6	13.9	61.5	>400	-	-
3 (500 AP)	24.8	58.1	346.2	25.5	63.5	>400	2.1	2.9	3.7	>400	-	-
4 (200 AP)	24.8	59.1	380.0	19.2	54.3	268.9	3.3	11.0	50.1	7.4	101.8	394.0
5 (500 AP)	2.6	16.5	59.0	2.8	3.6	75.5	2.0	2.5	4.5	2.5	3.5	75.0

Conclusion

From the two comparisons given, it can be seen that 500 ppm AP is more effective than 200 ppm.

APPENDIX XII

EXTRACT FROM CONFERENCE ROOM DOCUMENT No. 1

Health Implications of Erucic Acid Content of Rapeseed Oil (para 34)

The Committee had recommended that the FAO/WHO Expert Committee on Nutrition should be asked to consider the health implications of the erucic acid content of rapeseed oil and of the poly-unsaturated acids in oils such as sunflowerseed oil.

As regards erucic acid in rapeseed oil, the Secretariat was informed on the following:

- (a) Studies on experimental animals have shown that feeding of rapeseed oil containing high amounts of erucic acid results in lesions of the heart.
- (b) Very recent studies revealed that even feeding of rapeseed oil containing zero erucic acid results in lesions of the heart, showing that there may be a constituent in rapeseed oil, other than erucic acid, which causes the development of lesions in the heart.
- (c) There is as yet no data to show any detrimental effects of erucic acid in humans.

Furthermore, the Secretariat was informed that the matter will be on the agenda of a Joint FAO/WHO Expert Consultation on "Dietary Fats and Oils" scheduled for the biennium 1976-77.

PROPOSED DRAFT STANDARD FOR EDIBLE LOW ERUCIC ACID RAPESEED OIL
(At Step 5 of the Codex Procedure)

1. DESCRIPTION

Low Erucic acid Rapeseed Oil (synonyms: Canbra Oil; Lobra Oil; Lear Oil) is produced from the low erucic acid oil-bearing seeds of varieties derived from the Brassica napus L., Brassica campestris L. species.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Identity Characteristics

2.1.1 Relative Density (20°C/water at 20°C)	0.910 - 0.920
2.1.2 Refractive Index (n_D 40°C)	1.465 - 1.469
2.1.3 Saponification Value (mg KOH/g oil)	186 - 198
2.1.4 Iodine Value (Wijs)	94 - 120
2.1.5 Crismer Value	67 - 70
2.1.6 Unsaponifiable Matter	not more than 20 g/kg
2.1.7 Brassicasterol (% of total sterols)	8 - 12
2.1.8 Erucic Acid	not more than 1% (m/m) of the component fatty acids

2.2 Quality Characteristics

2.2.1 Colour: Characteristic of the designated product.

2.2.2 Odour and Taste: Characteristic of the designated product and free from foreign and rancid odour and taste.

2.2.3 Acid Value: not more than 0.6 mg KOH/g oil.

2.2.4 Peroxide Value: not more than 10 milliequivalents peroxide oxygen/kg oil.

3. FOOD ADDITIVES

The following provisions in respect of food additives are subject to endorsement by the Codex Committee on Food Additives.

3.1 Colours

The following colours are permitted for the purpose of restoring natural colour lost in processing or for the purpose of standardizing colour, as long as the added colour does not deceive or mislead the consumer by concealing damage or inferiority or by making the product appear to be of greater than actual value.

	<u>Maximum level of use</u>
3.1.1 Beta-carotene	Not limited
3.1.2 Annatto	Not limited
3.1.3 Curcumin	Not limited
3.1.4 Canthaxanthine	Not limited
3.1.5 Beta-apo-8'-carotenal	Not limited
3.1.6 Methyl and ethyl esters of Beta-apo-8'-carotenoic acid	Not limited

3.2 Flavours

Natural flavours and their identical synthetic equivalents, except those which are known to represent a toxic hazard, and other synthetic flavours approved by the Codex Alimentarius Commission are permitted for the purpose of restoring natural flavour lost in processing or for the purpose of standardizing flavour, as long as the added flavour does not deceive or mislead the consumer by concealing damage or inferiority or by making the product appear to be of greater than actual value.

3.3 Antioxidants

3.3.1 Propyl, octyl and dodecyl gallates

3.3.2 Butylated hydroxytoluene (BHT),
3.3.3 Butylated hydroxyanisole (BHA) }

3.3.4 Any combination of gallates with BHA or BHT, or both

3.3.5 Ascorbyl palmitate }
3.3.6 Ascorbyl stearate }

3.3.7 Natural and synthetic tocopherols

3.3.8 Dilauryl thiodipropionate

3.4 Antioxidant Synergists

3.4.1 Citric acid

3.4.2 Sodium citrate

3.4.3 Isopropyl citrate mixture }

3.4.4 Monoglyceride citrate }

3.4.5 Phosphoric acid }

3.5 Anti-foaming Agent

Dimethyl polysiloxane (syn. Dimethyl silicone)

Maximum level of use

100 mg/kg, individually
or in combination

200 mg/kg, individually
or in combination

200 mg/kg, but
gallates not to
exceed 100 mg/kg

200 mg/kg, individually
or in combination

Not limited

200 mg/kg

Not limited

Not limited

100 mg/kg,
individually or in
combination

10 mg/kg, singly or
in combination with
silicon dioxide

4. CONTAMINANTS

4.1 Matter volatile at 105°C

4.2 Insoluble impurities

4.3 Soap content

4.4 Iron (Fe)

4.5 Copper (Cu)

4.6 Lead (Pb)

4.7 Arsenic (As)

Maximum Level

0.2% m/m

0.05% m/m

0.005% m/m

1.5 mg/kg

0.1 mg/kg

0.1 mg/kg

0.1 mg/kg

5. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared in accordance with the appropriate Sections of the General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (Ref. No. CAC/RCP 1-1969).

6. LABELLING

In addition to Sections 1, 2, 4 and 6 of the General Standard for the Labelling of Prepackaged Foods (Ref. CAC/RS 1-1969), the following specific provisions apply:

6.1 The Name of the Food

6.1.1 All products designated as low erucic acid rapeseed oil, low erucic acid turnip rape oil, low erucic acid colza oil, canbra oil, lobra oil, lear oil must conform to this standard.

6.1.2 Where low erucic acid rapeseed oil has been subject to any process of esterification or to processing which alters its fatty acid composition or its consistency, the name low erucic acid rapeseed oil or any synonym shall not be used unless qualified to indicate the nature of the process.

6.2 List of Ingredients

6.2.1 A complete list of ingredients shall be declared on the label in descending order of proportion.

6.2.2 A specific name shall be used for ingredients in the list of ingredients except that class titles may be used in accordance with sub-section 3.2(c)(ii) of the General Standard for the Labelling of Prepackaged Foods.

6.3 Net Contents

The net contents shall be declared in accordance with sub-section 3.3(a) of the General Standard for the Labelling of Prepackaged Foods.

6.4 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared.

6.5 Country of Origin

6.5.1 The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

6.5.2 When the product undergoes processing in a second country which changes its nature, the country in which the processing is performed shall be considered to be the country of origin for the purposes of labelling.

7. METHODS OF ANALYSIS AND SAMPLING

The methods of analysis and sampling referred to hereunder are international referee methods and are subject to endorsement by the Codex Committee on Methods of Analysis and Sampling.

7.1 Determination of Relative Density

According to the FAO/WHO Codex Alimentarius Method (FAO/WHO Methods of Analysis for Edible Fats and Oils, CAC/RM 9-1969, Determination of Relative Density at t/20°C).

Results are expressed as relative density at 20°C/water at 20°C.

7.2 Determination of Refractive Index

According to the IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.B.2 Refractive Index).

Results are given as the refractive index relative to the sodium D-line at 40°C ($n_{D,40^{\circ}C}$).

7.3 Determination of Saponification Value (I_S)

According to the IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.2 Saponification Value (I_S)).

Results are expressed as the number of mg KOH/g oil.

7.4 Determination of Iodine Value (I_I)

According to the (Wijs) IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.7.1, II.D.7.2 and II.D.7.3 The Wijs Method).

Results are expressed as % m/m absorbed iodine.

7.5 Determination of Crismer Value (I_C)

According to the AOCS method (Official and Tentative Methods of the American Oil Chemists' Society; AOCS Official Method Cb 4-35, Crismer Test, Fryer and Weston Modification, and Ca5a - 40, Free Fatty acids, calculating the acidity as oleic acid).

Results are expressed by a conventional value (I_C) as described in the method.

7.6 Determination of Unsaponifiable Matter

According to the IUPAC (1964) diethyl ether method (IUPAC) (Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.5.1 and II.D.5.3).

Results are expressed as g unsaponifiable matter/kg oil.

7.7 Determination of Erucic Acid

(Method using gas-liquid chromatography to be developed).

7.8 Determination of Sterols

(Method to be developed).

7.9 Determination of Acid Value (I_A)

According to the IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.1.2 Acid Value (I_A)).

Results are expressed as the number of mg KOH required to neutralize 1 g oil.

7.10 Determination of Peroxide Value (I_p)

According to the IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.D.13 Peroxide Value).

Results are expressed as milliequivalents active oxygen/kg oil.

7.11 Determination of Matter Volatile at 105°C

According to the IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.C.1.1 Moisture and Volatile Matter).

Results are expressed as % m/m.

7.12 Determination of Insoluble Impurities

According to the IUPAC (1964) method (IUPAC Standard Methods for the Analysis of Oils, Fats and Soaps, 5th Edition, 1966, II.C.2 Impurities).

Results are expressed as % m/m.

7.13 Determination of Soap Content

According to the FAO/WHO Codex Alimentarius Method (FAO/WHO Methods of Analysis for Edible Fats and Oils, CAC/RM 13-1969, Determination of Soap Content).

Results are expressed as % m/m sodium oleate.

7.14 Determination of Iron (*)

According to the FAO/WHO Codex Alimentarius Method (FAO/WHO Methods of Analysis for Edible Fats and Oils, CAC/RM 14-1969 Determination of Iron Content).

Results are expressed as mg iron/kg.

7.15 Determination of Copper (*)

According to the AOAC (1965) method (Official Methods of Analysis of the AOAC, International Union of Pure and Applied Chemistry Carbamate Method, 24.023-24.028).

Results are expressed as mg copper/kg.

7.16 Determination of Lead (*)

According to the AOAC (1965) method, after complete digestion, by the colorimetric dithizone determination procedure (Official Methods of Analysis of the AOAC, 1965, 24.053 (and 24.008, 24.009, 24.043 j, 24.046, 24.047 and 24.048)).

Results are expressed as mg lead/kg.

7.17 Determination of Arsenic

According to the colorimetric silver diethyldithiocarbamate method of the AOAC (Official Methods of Analysis of the AOAC, 1965, 24.011-24.014, 24.016 - 24.017, 24.006 - 24.008).

Results are expressed as mg arsenic/kg.

(*) Might be replaced by Atomic Absorption Spectrophotometry in the future.