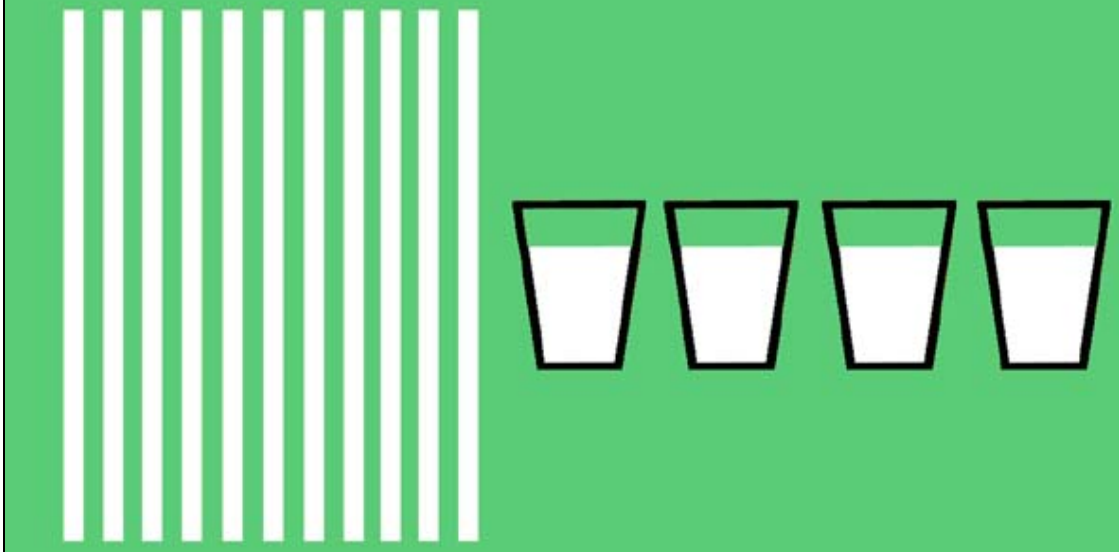
Joint FAO/WHO Food Standards Programme

JOINT FAO/WHO COMMITTEE OF GOVERNMENT EXPERTS ON THE CODE OF PRINCIPLES CONCERNING MILK AND MILK PRODUCTS

Report of the Twentieth Session

Held in Rome, Italy, 26-30 April 1982



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
WORLD HEALTH ORGANIZATION
Rome

CX 5/70 - 20th Session

REPORT of the
TWENTIETH SESSION
of the
JOINT FAO/WHO COMMITTEE OF GOVERNMENT EXPERTS ON THE CODE OF PRINCIPLES CONCERNING MILK AND MILK PRODUCTS

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26 - 30 April 1982

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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SUMMARY OF POINTS FOR ACTION BY GOVERNMENTS

1. Governments are requested to make their comments available by 30 April 1983 latest. All communications should be sent, if possible, in duplicate and addressed to the Technical Secretary, Committee on the Code of Principles concerning Milk and Milk Products, Animal Production and Health Division, FAO, Rome.

2. Governments may send observations regarding any matter they would wish to raise.

   Those specific points on which the Committee agreed that comments should be sought are the following:

Acceptance of the Code of Principles	- Governments to continue to submit their acceptances. In view of the fundamental importance of the Code, the Committee recommends the governments to give acceptances with deviations or reservations. (See para. 14 of this Report),
Redraft of the:	- Submitted to governments for acceptance.
- Recommended General Standard for Cheese, A-6	(See Appendix II of the Report of the 19th Session)
- Recommended General Standard A-8(a) for Named Variety Process(ed) Cheese and Spreadable Process(ed) Cheese	(See Appendices II-A, III-B and III-C of the Report of the 19th Session).
- Recommended General Standard A-8(b) for Process(ed) Cheese" and "Spreadable Process(ed) Cheese"	" " "
- Recommended General Standard A-8(c) for Processed Cheese Preparations (Process(ed) Cheese Food and Process(ed) Cheese Spread)	" " "
at Step 7 of the Committee's Procedure for the Elaboration of Milk and Milk Product Standards	
When considering acceptance of compositional standards A-1 to A-7, A-9, A-10, A-11(a) and A-11(b). Governments should bear in mind Decision No. 5 (see 7th Edition of the Code of Principles and paras. 65 to 70 of the Report of the 17th Session).	
- Compositional Standards A-1 to A-5 and-A--7, redrafts at Step 7 of the above Procedure	Governments to continue to submit their acceptance or confirm their acceptances. (See 7th Edition of the Code of Principles).
- Compositional Standard A-10 for Cream Powder at Step 7 of the above Procedure	- Governments to continue to submit their acceptances, (See 7th Edition of the Code of Principles).

- Compositional Standard A-11(a) for Yoghurt and Sweetened Yoghurt at Step 7 of the above Procedure	- Governments to continue to submit their acceptances, (See Report of the 17th Session, Appendix VII).
- Compositional Standard A-11(b) for Flavoured Yoghurt at Step 7 of the above Procedure	- Governments to continue to submit their acceptances, (See Report of the 18th Session, Appendix III).
- Compositional Standard A-9 for Cream at Step 7 of the above Procedure	- Governments to continue to submit their acceptances, (See Report of the 18th Session, Appendix IV).
- Compositional Standard A-12 for Edible Acid Casein at Step 7 of the above Procedure	- Governments to continue to submit their acceptances. (See Report of the 18th Session, Appendix V).
- Compositional Standard A-13 for Edible Caseinate at Step 7 of the above Procedure	- Governments to continue to submit their acceptances. (See Report of the 18th Session, Appendix VI).
<u>International Individual Cheese Standards</u>	
- C-1 to C-25 and C-26 to C-34 at Step 7 of the Procedure for the Elaboration of International Individual Cheese Standards	- Governments to continue to submit their acceptances. (See CAC/C1-C25 (1972) Recommended International Standards for Cheeses and Government Acceptances, Appendices VII-A to VII-E to the Report of the 15th Session and Appendices V-A to V-D to the Report of the 16th Session. [See also para. 111 of the Report of the 17th Session and paras. 25 to 35 of the Report of the 18th Session).
- C-35 Extra Hard Grating Cheese	- Submitted to Governments for acceptance. (See paras. 42 to 52 of this Report and Appendix IV).
<u>Standard Methods of Analysis</u>	
- B-1 to B-8 and B-10 to B-15	- Governments to continue to submit their acceptances. (See 7th Edition of the Code of Principles and Appendix III of this Report)•
- Milk Fat, Detection of Vegetable Pat by the Phytosteryl Test, Standard Method B-16	
- Milk Fat, Detection of Vegetable Fat by Gas-liquid Chromatography of Sterols, Standard Method B-17	- Governments to continue to submit their acceptances. (See Report of the 19th Session, Appendices X, XI, XII, IX-I, IX-J and IX-K).
- Cheese, Determination of Chloride Content, Standard Method B-18	
- Cheese - Determination of Nitrate and Nitrite Contents B-19	
Anhydrous milk fat - Peroxide Value B-20	
Butter - Water, Solids-non-fat and Fat on the same test portion B-21	

- Caseins and Caseinates - Determination of Water Content - Rennet caseins and caseinates - Determination of Ash - Caseins - Determination of "fixed ash" - Caseins and caseinates - Determination of protein content - Caseins - Determination of free acidity - Milk and Milk Products - Determination of Lactose in the presence of other reducing substances - Dried milk - Determination of titratable acidity	- Submitted to governments for acceptance. (See Appendix III of this Report).
- Use of natamycin (pimaricin) in cheese	- Governments to provide information to what extent and in which cheeses this additive is used. (See paras. 47 and 49 of this Report).
- Amendments of cheese standards	- Governments to comment on the amendments proposed by Denmark. (See para. 52 and Appendix VII of this Report) .
- Amendment of Standard A-1 for Butter and A-2 for Milkfat	- Governments to comment on the proposed amendment, (See paras. 55 to 56 of this Report).
- General Standard A-6 for Cheese	- Governments to comment on the proposed amendments. (See paras. 58 to 61 of this Report).
- Heat treatments of milk and milk products	- Governments to comment on the revised version. (See paras. 63 to 67 and Appendix II of this Report)
- Use of non-milk proteins in products covered by Article 4 of the Code of Principles	- Governments to submit information on such use. (See para. 103 of this Report).
- General guidelines for the use of milk proteins in non-milk products	- Governments to comment as to whether the "Milk Committee" should elaborate such guidelines. (See para. 104 of this Report).

CX 5/70 - 20th Session
April 1982

REPORT OF THE TWENTIETH SESSION OF THE JOINT FAO/WHO COMMITTEE OP GOVERNMENT EXPERTS OS* THE CODS OF PRINCIPLES CONCERNING MILK AND MILK PRODUCTS

Rome, 26 - 30 April 1982

INTRODUCTION

1. The Twentieth Session of the Joint FAO/WHO Committee of Government Experts on the Code of Principles concerning Milk and Milk Products was held at FAO Headquarters in Rome, from 26 to 30 April 1982. The session was attended by 112 participants including representatives and observers from 39 countries, and observers from 7 organizations (see Appendix I for the List of Participants).

2. The Committee was presided over by its Chairman, Mr. K.P. Andersen (Denmark) and Dr. R. Weik (USA), who was elected as Vice Chairman. The Joint Secretaries were Dr. F. Winkelmann (FAO), Dr. N. Rao Maturu (Joint FAO/WHO Food Standards Programme) and Dr. A. Koulikovskii (WHO).

3. The Twentieth Session of the Committee was convened by the Directors-General of FAG and WHO, The meeting was opened by Dr. Z.I. Sabry, Director, Pood Policy and Nutrition Division, who reviewed the programme of work of the Committee, the progress being made by the Codex Alimentarius Commission on standards and their acceptance by governments, the International Scheme for the Coordination of Dairy Development (ISCDD) and the activities of the FAO dairy training programme. Dr. Sabry mentioned in particular that the Commission at its 14th Session had considered certain aspects of acceptances of milk product standards and work on low fat spreads, certain types of ghee, on a code of hygienic practice for dry milk and on the guidelines for datemarking, which were of interest to the Committee. The Commission's discussion on these items was reflected in document MDS 82/3, which contained an excerpt of the Commission's Report.

4. In his introductory statement the Chairman of the Committee expressed his pride in the Committee's achievements. He emphazized that in a world of technological development and changes in demand it was more important than ever that consumers are not misled and that the dairy industry is given fair and honest competition. Milk and milk products are rather sensitive to competitive products and therefore the Code of Principles and associated standards - naturally always up-dated - are not of less importance today and in the future than they were in the past. Mr. Andersen specifically thanked the International Dairy Federation for the excellent work it had done between the Committee's last and present session which was essential for the preparation of this session.

Election of Chairman and Vice-Chairmen for the 21st Session

5. The Committee unanimously elected Dr. R. Weik (USA), Chairman of the Committee, to serve from the end of the 20th Session until the end of the 21st Session. The Committee also unanimously elected Mr. G.A. Bastin (Federal Republic of Germany) and Mr. A. Oterholm (Norway) to be first and second Vice-Chairmen, respectively, both to serve from the end of the 20th Session until the end of the 21st

Session. The Committee expressed its appreciation of the outgoing Chairman of the Committee and of the Vice-Chairman.

Adoption of Agenda

6. Following a suggestion by the Chairman the provisional agenda was adopted with some rearrangement in the order of items to be discussed. The Committee agreed to include in the Agenda the revision of compositional standards, Codex work on vegetable proteins and, following a proposal of the Delegation of Sweden, an information on a new method of preserving raw milk.

Acceptance of the Code of Principles and Associated Standards

7. The Committee was informed of the latest position regarding government acceptances of the Code of Principles, the Associated Standards and Methods of Analysis and Sampling. This was as follows:

Code of Principles	Number of Acceptances
Group I	33
Group II	4
Group III	35
Redraft of Standard	**Accepted by***
A-1 for Butter	13 countries: Belgium*, Bulgaria*, Canada*, Denmark*, Egypt*, Finland, France*, F.R. of Germany*, Iran, Kenya, Netherlands*, New Zealand*, Norway,* Poland*.
A-2 for Butteroil	11 countries: Bulgaria*, Canada, Denmark*, Egypt*, France, Finland, Hungary, Netherlands*, New Zealand, Norway*, Poland*.
A-3 for Evaporated Milk	14 countries: Belgium*, Canada*, Denmark*, Egypt*, Finland, F.R. of Germany*, Hungary, Iran, Kenya, Netherlands*, New Zealand*, Poland*, Switzerland*, USA*.
A-4 for Sweetened Condensed Milk	15 countries: Belgium*, Bulgaria*, Canada*, Denmark*, Egypt*, Finland*, F.R. of Germany*, Hungary, Iran, Kenya, Netherlands*, New Zealand*, Poland*, Switzerland*, USA*.
A-5 for Milk Powder	12 countries: Belgium*, Bulgaria*, Denmark*, Egypt*, F.R. of Germany*, Iran, Kenya, Netherlands, New Zealand*, Poland*, Switzerland*, USA*.
A-6 for Cheese	2 countries: Hungary, Poland.
A-7 for Whey Cheese	11 countries: Bulgaria*, Canada*, Denmark, Finland, F.R. of Germany*, Hungary, Iran, Netherlands*, New Zealand*, Norway, Poland*.

A-8 (a) for Named Variety Process(ed) Cheese and Spreadable Process(ed) Cheese	1 country: Poland*.
A-8 (b) for Process(ed) Cheese and Spreadable Process(ed) Cheese	1 country: Poland*.
A-8 (c) for Processed Cheese Preparations, (Process(ed) Cheese Food and Process(ed) Cheese Spread)	1 country: Poland*.
<u>New Standards</u>	
A-9 for Cream	3 countries: Egypt*, Poland*, Philippines.
A-10 for Cream Powder	7 countries: Bulgaria*, Denmark*, France*, Hungary, Iran, New Zealand*, USA*.
A-11 (a) for Yoghurt and Sweetened Yoghurt	4 countries: France*, Iran, New Zealand*, Poland
A-11 (b) for Flavoured Yoghurt	3 countries: F.R. of Germany*, New Zealand*, Philippines.
A-12 for Edible Acid Casein	2 countries: Hungary, New Zealand,
A-13 for Edible Caseinate	2 countries: Hungary, New Zealand.

* "country" means acceptance with reservations of various kinds. Details of acceptance and remarks by governments will be published in the 8th Edition of the Code of Principles concerning Milk and Milk Products. The Government of Malawi intends to accent the standards contained in the 7th Edition of the Code of Principles after a period of five years (target acceptance).

Methods of Sampling and Analysis		Number of Acceptances
B-1	Sampling Methods for Milk and Milk Products	49
B-2	Determination of the Fat Content of Dried Milk	48
B-3	Determination of the Fat Content of Cheese and Processed Cheese Products	47
B-4	Determination of the Acid Value of Fat from Butter	46
B-5	Determination of the Refractive Index of Fat from Butter	47
B-6	Determination of the Fat Content of Milk	18
B-7	Determination of the Fat Content of Evaporated Milks and of Sweetened Consensed Milks	28
B-8	Determination of the Salt (Sodium Chloride) Content of Butter	19
B-10	Determination of the Fat Content of Whey Cheese	8
B-11	Determination of the Dry Matter Content in Whey Cheese	12
B-12	Determination of the Phosphorus Content of Cheese and Processed Cheese Products	12
B-13	Determination of the Citric Acid Content of Cheese and Processed Cheese Products	12
B-14	Polarimetric Determination of the Sucrose Content of Sweetened Condensed Milk	12
B-15	Determination of the Fat Content of Cream	8
B-16	Milk Fat, Detection of Vegetable Fat by the Phytosteryl Method	2
B-17	Milk Fat, Detection of Vegetable Fat by Gas-liquid Chromatography of Sterols	2
B-18	Determination of Chloride Content	2
B-19	Determination of Nitrate and nitrite Contents in Cheese	1
B-20	Determination of Peroxide Value in Anhydrous Milk Fat	1
B-21	Determination of Water, Solids-not-Fat and Fat Contents on the same Test Portion in Butter	1

DETAILS OF ACCEPTANCE OF INTERNATIONAL INDIVIDUAL CHEESE STANDARDS

Cheese Variety	Belgium	Bulgaria	Brazil	Canada	Denmark	Finland	France	F.R. of Germany	Hungary	Iran	Ireland	Kenya	Malta	Netherlands	New Zealand	Norway	Philippines	Poland	Spain	Sweden	Switzerland	Trinidad & Tobago	U.K.	U.S.A.	No. of Acceptances
C-1 Cheddar		x	x	x	x	x	x	x		o	o			x	o	x		o	o	o	x	(**)	o	x	19
C-2 Danablu				x	o		x	x	o	o	o			x	x	o		x	o		x	(**)	o		15
C-3 Danbo				x	o	x	x	x	o	o	o			x	x	o		x	x		x	(**)	x		16
C-4 Edam	o	x	x	x	o	x	x			o	o			o		o		x	o		x	(**)	o	x	17
C-5 Gouda	o	x	x	x	x	x	x			o	o			o				x	o		x	(**)	o	x	16
C-6 Havarti				x	o	x	x		o	o	o				x	o		x	x		x	x	x		14
C-7 Samsos				x	o	x	x	x	o	o	o			x	x	o		x	x		x	x	x		16
C-8 Cheshire	o			x	x	x	x	x	o	o			o	x		o		x	o	o	x	(**)	o	x	18
C-9 Emmentaler		x	x	x	x	x	x		o	o			o	x		x		x	o		x	(**)	x	x	17
C-10 Gruyère			x	x	o	x	o		o	o			o	x		o		o	o		x	(**)	o	x	16
C-11 Tilsiter			x		o	x	x	x	o	o				x		x		x			x	x	x		13
C-12 Limburger	x		x		o	x	x	x	o	o				x		x		x				x	x	x	14
C-13 Saint-Paulin						x	x		o	o								x		o	x	x	o		9
C-14 Svecia	x				o	x	x	x	o	o				x		o		x		o	x	x	x		14
C-15 Provolone	x		x		x	x	x			o				x				x			x	(**)	x	x	12
C-16 Cottage Cheese incl. Creamed Cottage Cheese	x					x	x		o	o								x			x	(**)		x	9
C-17 Butterkäse	o				o	x	x	x	o	o				x		x		x	x			x)			13
C-18 Couloimniers						x	o		o	o				x		o		x	x		x	x)	o		11
C-19 Gudbrandsdalsost (whey cheese)					o	x	x		o	o				x		o		x	o	o	x	x)			11
C-20 Harzer Käse					x	x	x	o	o	o				x		x		x	o			x)	x		12
C-21 Herrgärdsost					o	x	x		o	o				x		o		x	o	o		x)	x		12
C-22 Hushällsost					o	x	x		o	o				x		o		x	o	o		x)	x		12
C-23 Norvegia					o	x	x		o	o				x		o			o	o	x	x)	x		13
C-24 Maribo	x				o		x		o	o		o				x			x						8
C-25 Fynbo	x				o		x		o	c		o				x			x						8
C-26 Esrom					o		x	x	o	o				o		x	o	x	x						10
C-27 Romadur					o	o	o	o	o	o				o		x	o	x	x						11
C-28 Amsterdam					o		x	x	o	c				o		x	o	x	x						10
C-29 Leidse					o		x	x	o	o				o		x	o	x	o						10
C-30 Friese					o		x	x	o	o				o		x	o	x	o						10
C-31 Cream Cheese					x	x				o								x							4
C-32 Blue-Veined						x	x		o	o								x							5
C-33 Camembert						o	x		o	o				x				x							6
G-34 Brie						o	o		o	o				x				x							6
C-35 Hard Grating Cheese									o									x							2

o = acceptance
x = acceptance with certain reservations
(**) = 'target acceptance' according to the Codex
x) = any cheese meeting the standard concerned could be freely distributed in Trinidad and Tobago

8. The Committee was informed that the Eighth Edition of the Code of Principles and Associated Standards including international individual cheese standards would be issued as soon as feasable. It would include amended standards and list of acceptances for all standards and of the Code of Principles,

9. The Committee noted that the "Decisions of the Committee" which were included in the Code of Principles had not been subjected to acceptance by governments and did not form part of the Code itself. The Committee was reminded that governments need to give a specific response in respect of recombined and reconstituted products when accepting milk product standards to which Decision No. 5 was applicable.

Matters of Interest arising from other sessions

10. The Committee had before it document BIDS 82/4 which contained matters of interest arising from other sessions.

Review of Acceptances under the Code of Principles concerning Milk and Milk Products and under the Codex Procedure to determine whether there is a need for guidelines for governments for the acceptance of milk product standards

11. The Committee had before it document MDS 82/4, containing an extract on the above topic from the Report of the Seventh Session of the Codex Committee on General Principles (ALINORM 81/33, paras. 24-27). In introducing this subject the Secretariat informed the Committee that, on the basis of a review of a detailed analysis of deviations which had been notified under Acceptance with Specific Deviations of the International standards for products other than milk products, the Codex Committee of General Principles, at its Sixth Session, had come to the conclusion that there was no real need to establish guidelines to assist governments in distinguishing between meaningful acceptance with specified deviations and an acceptance with specified deviation which would be tantamount to non-acceptance (ALINORM 79/35, paras. 15-23). The paper analysing the deviations was referenced as CX/GP 79/4.

12. The Committee was also informed that the International Dairy Federation (IDF) had prepared a paper for the above session of the Codex Committee on General Principles. The observers from the IDF at the above session had indicated that, in the light of developments and tendencies in recent years concerning notification of acceptances of milk product standards under Codex rules, on the one hand, and under the Milk Code, on the other, it would now be appropriate to accept the notion of both less stringent and more stringent deviations in connection with acceptance of milk product standards. Thus, the observer from the IDF considered that it would be logical to have the same procedures or methods of acceptance for all food products. The Codex Committee on General Principles agreed that, for the purposes of acceptances, milk products were not inherently different from other food product. The Committee agreed therefore that, for acceptance purposes, international standards for milk products should, in principle, be dealt with in the same way as international standards for other food products. The Committee also agreed to recommend to the Commission that the above proposals of the IDF for harmonization of the acceptances procedures, as had been set forth in IDF document CX/GP 79/7, be accepted by the Commission. The Commission, at its Thirteenth Session, adopted the harmonization proposals of the IDF (ALINORM 79/38, para. 126).

13. Although the Codex Committee on General Principles considered that for acceptance purposes, there was no reason to distinguish between milk product standards and standards for other food products, nevertheless it expressed the wish to

have before it at its Seventh Session an analysis of the deviations which had been notified in connection with acceptances of the milk product standards. This analysis was presented to the Seventh Session of the Committee in document CX/GP 81/3. The Committee on General Principles noted that none of the deviations notified were fundamentally at variance with the principles of the Code or indeed in conflict with the Guidelines of Governments for Accepting Milk Product Standards which the Committee on Milk and Milk Products had adopted at its 19th Session, and which were contained in paras. 128-130 of the Report of that session. The Committee on General Principles took note of certain additions to the above guidelines which had been proposed by the IDF. The Committee concluded, however, that the guidelines adopted by the Milk Committee did not need to be extended by the additions proposed in the IDF paper (CX/GP 79/7). The Committee decided to recommend to the Commission that the guidelines adopted by the Milk Committee would be quite sufficient. The Commission at its Fourteenth Session agreed with this recommendation (ALINORM 81/39, para. 167).

14. The Committee on Milk and Milk Products, at its current session, took note of the above developments, and agreed that the guidelines for governments referred to in paragraph 13 above, should be included in the new edition of the Code of Principles concerning Milk and Milk Products. The Committee also agreed to recommend to governments that, so far as the Code itself was concerned, acceptances be given without deviations or reservations, in view of the fundamental importance of the principles contained therein.

(a) Fat Spreads

15. The Committee noted that the Codex Committee on Fat and Oils (CCFO) elaborated a standard for fat spreads/spreadable table fats and had advanced it to Step 8 of the Codex procedure at its last session. The products, defined by the standard, would be spreadable emulsions, which were mainly of the type water in oil, produced from water and edible fats and oils which were not solely derived from milk and in which the fat content is not less than 20% and not more than 70% m/m. The standard will now go before the 15th Session of the Codex Alimentarius Commission for adoption and this would provide another opportunity for governments and international organizations to comment.

16. The Committee noted that the product definition did not exclude the use of milk fat and most delegations expressed concern that large proportions of milk fat could be used in the product without being declared.

17. The Committee agreed to the need for elaborating a standard for fat spreads with a lower fat content than butter, the fat content being entirely of milk origin, and noted with satisfaction that such a standard for fat spreads containing 39-41% milk fat is presently being eleborated by IDF. The standard after its finalization by IDF would be referred to this Committee.

18. The delegation of Spain, Belgium, Denmark, France, Federal Republic of Germany, Switzerland, Norway, Finland and the observers from the International Dairy Federation wanted to put on record their views that while the Codex Committee on Fats and Oils should be entrusted with the task of elaborating such standards covering products containing mixtures of milk fat and non-milk fat, it should do so employing the expertise of the Milk Committee.

(b) Vegetable ghee and mixed animal and vegetable ghee

19. The Codex Committee on Fats and Oils (CCFO) at its 12th Session, noting that the above designations were not acceptable to the International Dairy Federation, which expressed its opinion that the use of misleading names and information for products which are not milk or milk products, and which might thereby be confused with milk or milk products was not in line with Article 4 of the Code of Principles and should be prohibited. The CCFO proposed the title "VANASPATI/VEGETABLE FAT MIXTURE" for the standard being elaborated as "vegetable ghee". The title "VANASPATI" and the product definition which excludes the use of milk fat were in accordance with the proposals originally submitted by the Indian Dairy Federation.

20. The CCFO however faced difficulties with proposing a title for the standard being elaborated as "MIXED ANIMAL AND VEGETABLE GHEE" that would exclude the name 'ghee' since it learnt that a fairly large international trade already existed for the product under the name "vegetable ghee". The title MIXED VANASPATI/SUBSTITUTE GHEE was suggested by the CCFO. The title MIXED VANASPATI was in accordance with the proposal originally submitted by the Indian Dairy Federation. The CCFO did not accept in toto the recommendations of IDF and included the name Ghee in the alternate title suggested and took no action to modify the product definition to exclude the use of milk fat.

21. The Committee noted that the titles suggested for the standards being elaborated were still in square brackets and both governments and international organizations could still comment. The Committee, while expressing its opinion that no problem was faced with the acceptance of CCFO's designation "Vanaspati/Vegetable Fat Mixture" for "vegetable ghee", noted that the use of the title "Substitute Ghee" was not in line with Article 4 of the Code of Principles concerning Milk and Milk Products which required that the title "Imitation Ghee" be used if the term ghee was employed. The Committee showed a preference for the title "Mixed Vanaspati" and concluded that the alternative title "Substitute Ghee" be deleted.

22. The delegation from Australia disagreed with the conclusions of the Committee and preferred the term "vegetable ghee" for the solely vegetable fat products and, if it came to a choice between mixed vanaspati and substitute ghee the title "Substitute Ghee" be retained since they would not be misleading to the consumer, as these products were already in the international market and consumers were familiar with them.

Code of Hygienic Practice for Dried Milk

23. The Committee was informed that the Code of Hygienic Practice for Dried Milk had been further considered in detail in the light of government comments by the Codex Committee on Food Hygiene at its Eighteenth Session, held from 22 to 26 February 1982. The Codex Committee on Food Hygiene had decided to advance the draft Code to Step 8 for adoption by the Commission at its 15th Session to be held in July 1983. The Committee was informed that the Code contained an Annex laying down recommended microbiological specifications.

24. The Committee recalled that at its 19th Session it had expressed the wish to have an opportunity of reviewing the Code before it was finalized by the Commission (CX 5/70, 19th Session, para. 104). Recognizing that it would not be possible for it to review the Code before the next session of the Commission, the Committee requested the Secretariat to include a specific reference, in the Circular Letter (CL) which would be

sent out to governments with the Report of the Food Hygiene Committee which would also contain the draft Code, to the desirability of providing an opportunity to the national experts who attend sessions of the Milk Committee to review the draft Code* The Committee noted that it was possible to submit comments on the draft Code for consideration by the Commission.

Information on the Revision of the General Standard for the Labelling of Prepackaged Foods

25. The Committee was informed that the Commission had agreed, at its 12th Session in April 1978, that it would be appropriate to review the General Standard for the Labelling of Prepackaged Foods in the light of developments in labelling since the standard was first published in 1969. A consultant had been engaged to prepare a working paper on the revision of the General Standard. The working paper, which was referenced as CX/FL 80/7, contained three parts. Part I reviewed some developments in labelling since 1969 and discussed the scope of the standard. Part II contained proposals for discussion for the amendment of the standard. Part III contained proposed draft guidelines to assist Codex Committees in elaborating labelling provisions in Codex standards. Document CX/FL 80/7 had been considered by the Codex Committee on Food Labelling at its 15th Session, held in Ottawa in November 1980. The Codex Committee on Food Labelling had decided to advance a revised text of the General Standard to Step 5 for consideration by the Commission at its 14th Session. The Commission advanced the revised text to Step 6. The Committee was informed that an ad hoc Working Group would meet in Ottawa on 13 and 14 May 1982 - immediately before the 16th Session of the Codex Committee on Food Labelling (17-21 May 1982) - to consider the revised text of the General Standard.

26. The Committee noted the above developments with interest. It also noted, from a response
by the Secretariat, that the revised text still envisages the possibility of additional or different provisions in individual Codex standards, where this would be justified.

Date Marking

27. The Committee had before it document MDS 82/4, Appendix II which contained "Guidelines for Date Marking of Prepackaged Foods for the Use of Codex Committees". The Committee was informed that these Guidelines had been adopted by the 14th Session of the Commission at Step 8. The Secretariat drew the particular attention of the Committee to Section 5 of the Guidelines entitled "Instructions to Codex Committees" and Section 6 "Presentation of Date Marking in Codex Standards". The Secretariat indicated that in adopting these Guidelines the Commission was requesting its commodity committees to consider date marking in relation to the products they were dealing with. Although the Committee had already provided for date marking in a number of standards, it decided not to review other standards at this point in time; but rather to await completion of the revision of the General Standard for the Labelling of Prepackaged Foods, when date marking and possibly many other labelling matters in individual milk product standards would need to be reviewed. It was agreed that the Secretariat should, following adoption of the revised version of the General Standard by the Commission, prepare, in collaboration with the IDF, a paper setting out labelling matters, including date marking, which should be looked into by the Committee at its next session. The offer of IDF to assist the Secretariat in this task was welcomed by the Committee.

Review of Food Additives Provisions in Milk Product Standards

28. The Committee had before it document MDS 82/5 and also Conference Room Document 1 containing a statement of IDF on non-endorsed food additives in the Recommended International Standards for Cheese.

29. The Committee noted that the review of IDF was based on the FAO/WHO document CL 1979/11 and agreed to discuss the items in the order in which they had been presented by IDF.

30. At the outset, the Committee took the following decisions:

(i) To retain in the standard all the non-endorsed Food Additive provisions for which there was technological justification and refer them to CCFA.

(ii) To delete all the non-endorsed Food Additives provisions from the standard for which there was no technological justification.

(iii) To retain all the non-endorsed Food Additives provisions which had not been cleared toxicologically in the standard with EP - endorsement postponed in brackets till such time that JECFA reconsidered them.

Extra hard grating cheese (standard C-35)

31. The Committee agreed with IDF that the presence of sorbic acid or of its sodium or potassium salts was necessary in order to inhibit the development of moulds on the surface of the cheese when the latter was subjected to difficult conditions of distribution, especially under high air temperature and high moisture conditions. This justification also held good for the use of the additive in processed cheese preparations (Standards A-8 (a,b,c)).

Processed Cheese. Standards A-8 (a,b,c)

Colours

32. The Committee noted that the provisions for colours, Annatto and Beta Carotene had not been endorsed by CCFA pending setting up of a maximum level in the final product and agreed that the same levels (600 mg/kg single or in combination) for these provisions which existed in the standard for Cheddar Cheese be suggested. As regards the maximum levels of use that could be suggested for a) Chlorophyll including Copper Chlorophyll, b) Riboflavin, c) Oleoresin of Paprika and d) Curcumin, the Committee had no information and suggested that such information might be sought from governments.

Vegetable Gums

33. The Committee agreed that the use of vegetable gums in products covered by Standard A-8(c) was technologically justified and awaited further action by CCFA after they had all been toxicologically cleared. The Committee agreed to include xanthan gum in the list of vegetable gums mentioned in Standard A-8(c).

Preservatives

34. The Committee expressed the opinion that propionic acid and its sodium and potassium salts when used in cheese exerted a mould inhibition effect similar to sorbic acid and that Nisin inhibited outgrowth of bacterial spores. The Committee agreed to convey this information to CCFA for their reconsideration of endorsement of the food additives in the processed cheese standard.

Additives related to a wide range of cheese standards Sodium and Potassium Nitrate

35. The Committee agreed (i) with the action of CCFA to relate the maximum levels of this additive to the cheese and not to cheese milk and (ii) to the level of 50 mg/kg of nitrate in cheese which had been endorsed.

36. The Committee agreed with the recommendations of IDF that provision for nitrates be deleted from Danablu (C-2) and Limburger Cheese (C-12) and that it be included in the Hushallsost (C-22) in which the use of nitrate was technologically justified.

Enzyme preparation

37. The Secretariat informed the Committee that it would not be possible for CCFA to give a blank endorsement for all enzymes and that additional information on the source of the enzymes was needed before CCFA could endorse.

38. The Committee was informed that such information was available in the US Food Chemicals Codex with regard to enzymes used in cheese manufacture and agreed that the International Dairy Federation, taking into consideration the information available in Food Chemicals Codex should prepare a list of optional enzymes approved as being suitable for use in cheese manufacture, which could then be referred to CCFA for endorsement. At the suggestion of the delegation of Belgium, IDF agreed to include considerations on purity and use of enzymes in the document that they would be preparing.

Acids, Bases and Salts

39. The Committee agreed that the retention of sodium/aluminiun monophosphate in the Food Additive provisions for processed cheese was technologically justified. The monophosphates as emulsifying agents were known to exert an action which slightly differed from other emulsifiers. It also agreed that sodium, potassium and calcium salts of mono, di- and polyphosphoric acids were necessary as emulsifying agents and that they should be retained.

Svecia (C-14), Herrgardsost (C-21), Norvegia (C-23) and Hushallsost (C-22)

40. The Committee agreed with the recommendation of IDF to delete provision for "Phosphates" in the above standards, because of lack of technological justification.

Cottage Cheese and Creamed Cottage Cheese (C-16)

41. The Committee agreed to expand the list of acids included in the Food Additives provisions to include glucono-delta-lactone at a maximum level of 10 g/kg and hydrochloric acid at a level limited by Good Manufacturing Practice.

Blue Veined Cheese (C-32) and Extra Hard Grating Cheese (C-35)

42. The Committee agreed that the use of Copper Chlorophyll complex was only justified to the extent that it was used to impart to the cheese a characteristic ivory colour (complementary colour) and expressed its opinion that the level of this additive should not exceed 15 mg Per kg of cheese.

Provolone (C-15) Colours

43. The Committee agreed with IDF that there was no technological justification for the use of Brilliant Blue FCF, Fast Green FCF and Indigotine FCF in Provolone and

expressed its opinion that they be deleted from the list of food additive provisions in the standard.

Flavours

44. The Committee agreed to include in the standard Smoke Extracts (aqueous) in addition to Smoke. Some delegations opposed the inclusion of artificial Smoke flavours, a question which should be further discussed.

Bleaching Agent

45. The Committee agreed to delete the provision for benzoyl peroxide from the standard.

Preservatives

46. The Committee agreed with Italy that the use of hexamethylenetetramine was technologically justified in order to prevent the late blowing due to clostridia in the cheese, the addition of nitrate not being adequate for the purpose. The hexamethylenetetramine was added during the manufacturing process and the amount in the cheese ready for consumption should not exceed 25 mg/kg of cheese expressed as formaldehyde.

Inclusion of other Food Additive provisions in Cheese Standards

47. The delegation of France proposed that the enzyme "lysozyme" which was present in tears and in saliva be included in the food additive provision for cheese standards and informed the Committee that hydrochloride of lysozyme was used in manufacture of cheese in its country to prevent the late blowing. The proposal made toy France was supported by Italy, where nitrates were not permitted for use in cheese manufacture. The Committee agreed to invite IDF to make a study of the technological use of lysozyme in the manufacture of cheese and prepare a document for consideration at the next session of the Committee.

48. The delegation of the United Kingdom proposed that Natamycin (Pemaricin) be included in the food additive provisions for cheese standards. The proposal of the United Kingdom was supported by Canada which expressed its opinion that the additives had been widely used in European countries as an antimould and antiyeast agent. The use of Pimaricin was not permitted in Switzerland, Venezuela and Brazil and EEC had not yet taken a position with regard to permitting the use of the additives. Some countries felt that Pimaricin could be used only for surface treatment of certain cheeses, of which the rind is not consumed.

49. The Committee agreed that a request be made to governments to provide information as to what extent the additive was used in cheese manufacture and to which cheese it was applied and to make this information available to IDF, on the basis of which IDF would prepare a document on the subject for consideration by the Committee at its next session.

Changes in Individual International Cheese Standards

50. The Committee noted that there was no documentation available on the subject.

51. Individual cheese standards were published in 1972 in CAC/C-1 - C-25 and in the reports of the Committee thereafter. Amendments had been made to the standards during the 17th and 18th Sessions of this Committee.

52. The delegation of Denmark informed the Committee that varied consumer needs and requests in the international market induced them to amend their national legislation with regards to cheese standards: C-2 Danablu, C-3 Danbo, C-6 Havarti, C-7 Samsos, C-24 Maribo, C-25 Fynbo, C-26 Esrom. These proposed amendments are given in Appendix VII. The Committee agreed to seek government comments on the amendments suggested by Denmark and to consider them at its next session.

Carry-over Principle

53. The Secretariat introduced the Conference Room Document 5 containing "Principles for the Carry-over of Food Additives" and requested the Committee to express its opinion as to which standards elaborated by the Committee the Carry-over Principles applied and which standards it did not apply.

54. The Committee expressed the opinion that this would be a difficult exercise, especially in the absence of a complete list of standards elaborated by it and agreed to consider this question at its next session where rather extensive revisions of the standards including labelling were expected to be made.

Review of Proposals for Amendments of Compositional Standards

Standards A-1 for Batter and A-2 for Butteroil, Anhydrous Butteroil, Anhydrous Milkfat

55. The Committee considered proposals by IDF to incorporate into standards A-1 and A-2, respectively, the following provisions for maximum copper and iron contents:

Standard A-1 Batter	Max. 0.05 mg Cu/kg
Standard A-2	Max. 0.05 mg Cu/kg
Butteroil, Anhydrous Butteroil, Anhydrous Milkfat	Max. 0.2 mg Fe/kg

56. The delegation of Australia expressed the view, that according to the results of extensive research in Australia on sweet cream butter, a limit of 0.05 mg Cu/kg (which might be necessary for butter manufactured from cultured cream) was unnecessarily restrictive and suggested a maximum level of 0.1 mg Cu/kg. The Committee, however, recognizing that Standard A-1 made no distinction between sweet cream and cultured butter, and talking into account a statement by the IDF delegate that IDF's proposal was based on enquiries from a large number of countries, decided to revise standards A-1 and A-2 as proposed by IDF. The Secretariat was asked to obtain Government comments on this decision for discussion and approval of the revised standards at the Committee's next session.

General Standard A-6 for Cheese

57. The Committee briefly considered and rejected a proposal by IDF to include salt (sodium chloride) among the list of ingredients not requiring to be declared (Section 4.2).

58. The Committee noted a proposal by the delegation of the United Kingdom to add the following sentence at the end of Section 3.2 "Other Additives":

> "For cheese in particulate form additives which have been endorsed by the Codex Committee on Food Additives for the improving of free flow characteristics may be used".

59. The Committee decided that governments be asked to comment on this proposal which was not discussed as it had not been submitted to governments in written form in advance of the Committee's Session.

60. The Committee further took note of the following proposal by the delegation of Denmark to amend Sections 1 and 2:

> ""It appears from para. 1 that the Standard A-6 does not include "whey cheeses". According to Danish opinion the term "whey cheeses" covers products made by coagulation of the protein content in whey or in mixtures of milk and whey (in many countries known under the designation Ricotta).
>
> Consequently, the Danish delegation suggested to add an explanation of the term "whey cheeses" to the last sentence of Section 1 "Scope", to read for instance as follows:
>
> "In this standard "whey cheeses" mean products defined in standard A-7 and products made by coagulating whey or mixtures of milk and whey and in which the whey protein/casein proportion exceeds that of normal milk".
>
> This explanation could for instance be given as a footnote to the Scope Section"."

61. The Committee again decided that governments be asked to comment on this proposal which was not discussed as it had not been submitted to governments in written form in advance of the Committee's Session.

Standard A-3 for Evaporated Milk and Standard A-4 for Condensed Milk

62. The Committee noted proposals by the delegation of Spain to amend Standards A-3 and A-4 by inserting provisions for maximum fat contents for skimmed evaporated and skimmed condensed milks and minimum milk solids-not-fat contents for other evaporated and condensed milks to distinguish between half-skimmed and high-fat products. Following a suggestion by the Chairman, the delegation of Spain agreed to send a detailed proposal for amendments of Standards A-3 and A-4 to IDF for review. The IDF delegate declared the willingness of his Organization to review the Spanish proposal and to report to the Committee's Secretariat accordingly. The Secretariat would undertake to inform governments about the view of IDF.

Heat Treatments of Milk and Milk Products

63. The Committee noted that a group of delegates from Australia, Canada, France, the Federal Republic of Germany, the United Kingdom and the United States of America had on an informal basis discussed the proposal of IDF as given in document MDS 82/7. The Group had suggested amendments which were brought to the attention of the Committee and are underlined in the revised version of IDF's proposals given in Appendix II of this Report.

64. In the ensuing discussions the delegation of Spain voiced doubts about abandoning the turbidity test for distinguishing between "sterilized" and "UHT" milk.

65. The delegation of the USA expressed their reservations concerning IDF's definitions for pasteurization, UHT and sterilization of milk and fluid milk products and referred to the US definition as contained in document MDS 82/7 part B, which summarized the US regulations. These regulations established the minimum heat treatments necessary to ensure the destruction of all pathogenic organisms and their spores as found to be necessary depending on the type of product and the manner in which the product is packaged and marketed, i.e. refrigerated or packaged in a hermetically sealed non-refrigerated container. Initially tuberculosis organisms were considered to be the most resistant bacteria, subsequently coxiella buruetti organisms were used (for refrigerated products) to determine the minimum levels of heat treatment

necessary. For products packaged in hermetically sealed non-refrigerated containers C botulinum organisms are the organisms of public health consideration.

66. The representative of WHO drew the Committee's attention to the fact that still many cases of foodborne diseases and zoonosis are due to consumption of non-heat-treated or not adequately heat-treated milk and milk products. In this context he emphasized the great public health significance of the efforts of the Joint FAO/WHO Committee of Government Experts on the Code of Principles concerning Milk and Milk Products in establishing definitions of, and safe levels for, heat treatments.

67. The Committee decided to invite government comments on the amended document as given in Appendix II i.e. the proposals of IDF, and on the comments by governments as reproduced in the Appendix. The Committee also agreed with the proposal of the delegation of the Federal Republic of Germany supported by the delegations of Denmark, New Zealand and Switzerland, to invite governments to indicate the maximum temperature/time limits permitted or intended to be permitted in their countries and which would not adversely affect the desired organoleptic and nutritional qualities of products*

IDF/ISO/AOAC Cooperation in the field of Methods of Sampling and Analysis

68. The Committee was informed of the work in the field of sampling and analysis undertaken by the representatives of IDF/ISO/AOAC during their meeting prior to the present session of the Committee by Dr. H. Werner of the International Dairy Federation. The report of the meeting (MDS 82/11) is contained in Appendix III of this Report.

69. The different methods presented in item 2 of the report were reviewed by the organizations in the light of government comments. Technical expressions which change with time differed in the different methods since they were standardized in different years.

70. In addition to the methods presented under item 2 of the report, the organizations developed a method for the determination of fat in edible ices, which will "be submitted to the Codex Committee on Methods of Analysis and Sampling.

71. The Committee was pleased to note that irrespective of the frequency of the meetings of the Joint FAO/WHO Committee of Government Experts on the Code of Principles concerning Milk and Milk Products, the three organizations would meet once a year to inform the Codex Secretariat about the progress made and strengthen the cooperation between the organizations and the Milk Committee.

72. The Committee approved the methods which are at Step c and Step g to go forward in the step procedure and agreed to send the methods which are at Step h for government acceptance (see Appendix III).

73. The delegation of the Netherlands proposed that IDF/ISO/AOAC should proceed with the development of methodology for identification of UHT treated milk since the deliberations of the Committee on the proposed definitions for heat treatment would take a considerable time for finalization. The delegation of Norway drew the attention of the Committee to the need for developing methodology for the determination of vegetable proteins in milk products (see para 98).

74. The Committee adopted the report as contained in MDS 82/11 and the Chairman on behalf of the Committee expressed his appreciation for the excellent work done by the three organizations.

Decision No. 6 on Imitation Milk and Imitation Milk Products

75. At the 18th Session of the Committee in 1976, consideration was given to the desirability of establishing general rules for the composition and labelling of imitation products and to the development of standards for specific products (para 131-138 of CX5/70 - 18th Session). At the 19th Session in 1978, it was reported that the Codex Alimentarius Commission had recommended that such standards should not be developed, and the Committee having agreed with this recommendation, briefly considered a proposal by the delegation of Denmark for amplification of the Code of Principles by a "Decision No. 6" dealing in more general terms with the compositional, hygienic and food additive aspects of imitation products (para 116 and Appendix V of CX5/70 -19th Session). The Committee agreed to submit the draft to governments for comment.

76. The Committee had before it document MDS 82/8 containing a revised Decision No. 6 prepared by the IDF and comments by governments on the original version of Decision No. 6 as given in the Report of the 19th Session of the Committee. The Committee further took note of written comments by the governments of Argentina and Denmark which were contained in conference room documents.

77. The Committee briefly considered the question of nutritional equivalence of imitation products and their compositional requirements in relation to milk products. Notwithstanding the fact that the manufacture and sale of imitation milk and imitation milk products was prohibited in a number of countries such as France, the Federal Republic of Germany, Switzerland and Venezuela, the Committee confirmed the need for a Decision to deal with such products on a worldwide basis, especially in view of their importance in the diets of populations from developing countries. The Committee supported the preferences given in the version prepared by the IDF, that imitation milk should be labelled in accordance with Article 4.2(b) of the Code of Principles rather than Article 4.2(a) and adopted the revised version of Decision No. 6 as given in document MDS 82/8 for inclusion in the next edition of the Code of Principles (see Appendix IV).

Use of the designation "cheese" for products manufactured with re combined and reconstituted milk

78. The Committee had before it Doc. MDS 82/9 setting out the position of Italy that the designation of "cheese" should be reserved solely for products obtained from natural milk.

79. The delegation of Spain supported the Italian position.

80. The delegation of France stated that while they could understand the Italian position as regards manufacture and sale of cheese in Italy, there were technologies available with the aid of which cheese of good quality could be produced from recombined and reconstituted milks. This was of particular importance in developing countries which did not have sufficient supplies of fresh milk for cheese making. The delegation of Canada drew attention to the use of fortification of cheese milk with milk solids and the use of recombined milk for cheese-making during seasonal shortage of fresh milk.

81. The views expressed by the delegation of Prance were supported by the delegations of Denmark, Brazil, the Federal Republic of Germany, Hew Zealand, Switzerland and Australia with the understanding that cheese made from recombined and reconstituted milk would not be sold nor manufactured in some of these countries

and that such cheese should be labelled as such as foreseen in the General Standard A-6 for cheese (CX 5/70 - 19th Session, Appendix II).

82. The delegation of the United States also stated that they had to oppose the proposal of Italy as the use of recombined and reconstituted milk in cheese-making was steadily expanding in their country.

83. The Committee concluded that the proposal of Italy was not acceptable and should not be further discussed.

Proposed Revision of Standard Ho, A-2 and Elaboration of a New Standard for Ghee

84. The Committee had before it (i) document MDS 82/10 which contained for its consideration a revision of FAO/WHO standard A-2, Milk Fat Products, and a draft standard for ghee and (ii) Comments from Argentine as contained in Conference Room Document No.2.

85. The Committee noted that the proposed revision of standard A-2 contained separate provisions for anhydrous milk fat, which is a high quality fat product and is extensively traded internationally, but which was not given a specific heading in the FAO/WHO standard. In addition the revised standard contained provisions for packaging requirements, for maximum levels for heavy metals, etc, and also minor revisions related to antioxidant provisions.

86. The Committee expressed the opinion that the revised standard was a little more detailed that the original standard. Also it felt that the quality provisions were a little too extensive and that the Codex format had not been followed.

87. The Committee agreed that there was no need in the standards for organoleptic attributes, such as taste and smell which were subjective criteria. Ho test and methodology had been established for neutralizing substances and the Committee questioned the basis for the establishment of peroxide value. The Committee also felt that the contaminants could be included in the quality provisions.

88. The Committee agreed to the need for the revision of Standard A-2 - Milk Fat Products. There was some discussion on whether to exclude anhydrous butter oil from the standard. The Committee agreed that the A-2 revision should include provision for Ghee.

89. A problem arose of how to accommodate the definition for raw materials which differed for anhydrous milk fat, anhydrous butter oil and butter oil and for ghee. While the three protects anhydrous milk fat, anhydrous butter oil and butter oil are derived from cows milk, ghee could be derived from other animal milks too. The Committee thought that the problem could be overcome by labelling provisions as given in the other milk product standards.

90. The Committee agreed on the following procedure for the further revision of standard A-2 - Milk Fat Products:

(a) IDF will prepare in the Codex Format a new draft Revision of A-2 - Milk Fat Products, on the basis of comments made by the Committee at the session. The preparation of the new draft will cover standards for (i) anhydrous milk fat, (ii) anhydrous butter oil, (iii) butter oil, as well as (iv) ghee.

(b) The new draft standard prepared by IDF will be sent by the Secretariat to Governments for comments well in advance of holding the next session of the Group of Experts.

(c) The IDF new draft standard "Revision of A-2 - Milk Fat Products" together with Government comments will be sent to Governments well in advance before the next session for discussion by the Committee.

Preservation of Raw Milk Quality by Activation of a Natural Antibacterial System in the Milk

91. The Committee had before it Conference Room Document No. 4 submitted by Sweden. The main features of the document were explained by the delegation of Sweden. The document contained details of a method which made use of a naturally present antibacterial system in the raw milk for its preservation.

92. The Committee was informed that the method suggested could be used for preservation of milk in emergency conditions and could prove beneficial to developing countries.

93 The Committee expressed its appreciation to the delegation of Sweden for having presented the above document. The Committee did not, however, discuss the document, since it had not been made available in advance of the session and could not be put before the Committee in all three languages of the Commmittee. The Committee agreed, however, to append the Swedish document to the report for the information of Governments. The Committee also requested IDF to review the Swedish document (see Appendix V).

Matters referred by the Codex Committee on Vegetable Proteins

94. The Committee was informed that the Codex Committee on Vegetable Proteins had held its Second Session from 1 to 5 March 1982, and had examined a document entitled "General Guidelines for the Utilization of Vegetable Protein Products in Foods". At its First Session, the Committee had noted (ALINORM 81/30 para. 97) that a review of existing regulations on vegetable proteins had shown that harmonization was required as regards the use, nutritional value and labelling of vegetable proteins, and that practical guidelines on these points were required by Codex Committees and national authorities. As a consequence the Delegation of Canada had undertaken the preparation of a paper which laid out guidelines for the safe and suitable use and appropriate labelling of Vegetable Protein Products (VPP) in foods.

95. The paper dealt with three primary uses of VPP.

1. Its uses for functional purposes
2. Its uses for increasing the content of utilizable proteins
3. Its uses for substitution and extension purposes

The paper also contained proposed draft guidelines for testing the safety and nutritional quality of VPP which were in large measure derived from the Protein and Calorie Advisory Group of the United Nations Guidelines for the preclinical testing of novel sources of protein (PAG Guideline Ho. 6).

96. During discussion of the paper the Codex Committee on Vegetable Protein had noted that although the Guidelines were intended to be of assistance to Codex Committees to develop standards for products containing VPP, care should be taken to avoid overlap with the work of other Committees, for example the Codex Committee on Foods for Special Dietary Uses and the Codex Committee on Food Labelling. It also noted that the Codex Committee on Processed Meat and Poultry Products had, with the

agreement of the Commission, begun work on draft guidelines for the use of VPP in meat and poultry and that this work would continue.

97. The Committee had decided that both the "Milk Committee" and the Codex Committee on Fish and Fishery Products should be informed about the development of the Guidelines which, after detailed discussion it had advanced to Step 3 of the Procedure.

98. At its Second Session the Codex Committee on Vegetable Proteins had also examined a document prepared by the Delegation of the Netherlands which dealt with quantitative methods for the differentiation of vegetable and animal proteins. It noted that in general, direct methods were preferable to indirect methods. Immunological methods seemed to be useful only for detection purposes because the antigenic constitution of the protein varies according to processing and source. Electrophoretic methods were applicable only to proteins which could be brought into solution and in the case of heated products presented extraction problems. Nevertheless the technique of electrophoresis in polyacrylamide gels (PAGE) containing sodium dodecyl sulphate (SDS) to reduce intra and intermolecular reactions seemed to be the method of choice. This method (SDS-PAGE) did not yet meet however the requirements of reproducibility which were obligatory for standard methods of analysis.

99. The Committee had agreed to keep the subject under constant review.

100. The Committee noted that the Report of the Second Session of the Codex Committee on Vegetable Proteins, which contained the Guidelines, would be issued very soon and that since these were at an early stage of development there would be ample opportunity for Governments to make substantive comments. It would be important, however, for Codex Contact Points to make the Guidelines available to the experts who attended sessions of the relevant Codex Committee.

101. In the discussion that followed, it was noted that the Terms of Reference of the Codex Committee on Vegetable Products covered vegetable proteins derived from any member of the plant kingdom. In the case of milk products, however, there were two aspects to be considered, one of which was the use of vegetable proteins in milk products and the other the use of milk proteins in other products. It was pointed out that the Codex Committee on Processed Meat and Poultry Products was elaborating guidelines only for the use of vegetable proteins in meat and poultry products, The Committee considered whether it should develop general guidelines for the use of milk proteins in non-milk products in the same way that the Codex Committee on Vegetable Proteins was developing General Guidelines of vegetable proteins in various kinds of foods. The Committee also considered whether it should concern itself with the use of vegetable proteins in imitation milk and imitation milk products.

102. Some delegations were of the opinion that, since methods of analysis for the differentiation of proteins from vegetable and animal source had not yet been established, guidelines would not serve a useful purpose. It was pointed out that the Milk Code did not permit the addition of vegetable proteins to milk products nor had standards for imitation milks, which might contain vegetable proteins, been elaborated.

103. After further discussion, the Committee agreed that there was insufficient information on the extent to which extraneous proteins were used in foods in general, and decided to ask for information on the use of non-milk proteins in products covered by Article 4 of the Code, and for comments on whether the "Milk Committee" should elaborate general guidelines for the use of milk proteins in non-milk products.

104. The Committee indicated its willingness to give information on the use of milk proteins to all Commodity Committees who wished to include milk proteins of any kind in their products and if necessary to elaborate general Guidelines for this purpose.

105. The Committee agreed to bring the above matters specifically to the attention of the Commission.

Future Work

106. The Committee noted that it would have before it for consideration at its next session the following items arising from the present session:

1. Revision of Standard A-2 Milk Fat Products, including Ghee.
2. Review of labelling sections including date marking and Carry-Over Principle in different standards elaborated by the Committee.
3. Amendments of Standard A-1 for Butter and the General Standard for Cheese A-6.
4. Amendments of International Individual Cheese Standards, proposed by Denmark.
5. Definitions of heat treatment of milk and milk products.
6. Review of food additive provisions for cheese standards.
7. Technical justification of non-endorsed food additives*
8. Possible revision of standards A-3 and A-4 for evaporated and condensed milk standards.
9. Consideration (1) of the need for the development of general guidelines by the Committee governing the use of milk proteins in non-milk products, on the basis of government comments (ii) of information to be requested from governments concerning the extent to which vegetable and other non-milk proteins are used in imitation milk® and imitation milk products and consider related analytical methods.

Date of Next Session and Procedure for the Work between Sessions of the Committee

107. In view of the need for the Committee to complete its work as described in para* 106 above, the Committee strongly requested the Secretariat to arrange for the convening of another session. The delegation of Hew Zealand questioned whether there was anything for the Committee to hold another session. The Secretariat indicated that it would have difficulty in providing for a session in the next biennium (1984/85), but undertook to make provision for the convening of a session in 1986, subject to the approval of the Codex Alimentarius Commission at its next Session in July 1983. The delegation of Australia expressed the view that the Committee should now adjourn sine die.

108. The Committee having noted that provision would be made by the Secretariat to convene another session of the Committee in 1986, agreed that the Procedure for the Elaboration of Milk Products Standards, International Individual Cheese Standards and Standard Methods of Analysis for Milk Products would continue to apply, which included preparatory and advisory work of the IDF. In addition the Secretariat would undertake in consultation with the Chairman and Vice-Chairman of the Committee to prepare periodically reports on acceptance of standards and other information received from Governments, and also on matters dealt with by other Codex bodies and related to the

work of the Milk Committee. The report should also include relevant information on work carried out by the IDF (including analytical matters in cooperation with ISO and AOAC) and other international organizations.

APPENDIX I

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LISTE DES PARTICIPANTS
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APPENDIX II

DEFINITIONS OF HEAT TREATMENT AS APPLIED TO MILK AND FLUID MILK PRODUCTS

Statement of the International Dairy Federation

The International Dairy Federation in its capacity as adviser to the FAO/WHO Committee on the Code of Principles Concerning Milk and Milk Products has been asked to made recommendations concerning the definitions of Pasteurization, Sterilization and UHT Treatment as applied to milk and milk products.

Pasteurization

A statement relating to pasteurization as applicable to milk and milk products was approved at the 64th Annual Sessions of IDF in September 1980, and after editorial modifications at the 20th Session of the Committee on the Code of Principles is given in Appendix A.

Sterilization and UHT Treatment

Until recently it has been generally accepted that a "STERILIZED MILK" does not give turbidity when subjected to a turbidity test, and indeed such a negative test is incorporated in the legislation of some countries. Furthermore a positive turbidity test has been regarded as the criterion of a "UHT MILK". However, there is now some doubt about the reliability of a turbidity test for distinguishing between "STERILIZED MILK" and "UHT MILK", and IDF is currently investigating test methods for distinguishing between the two types of product.

As an interim measure definitions were developed of sterilization and of the generic class of "sterilized product" which embraces both of the two sub-categories of those products usually marketed under the specific designations of "STERILIZED PRODUCT" and "UHT PRODUCT" respectively.

A Statement relating to "Sterilization" and to "STERILIZED" and "UHT" milk and fluid milk products, was approved at the 65th Annual Sessions of IDF in October 1981; and after editorial modifications at the 20th Session of the Committee on the Code of Principles is given in Appendix B. It comprises:

Section 1.1 - defining "sterilization" as applied to milk and fluid milk products;

Section 1.2 - defining the generic class of "sterilized product";

Section 2 - giving examples of typical temperature/time combinations for in-container sterilization and UHT continuous flow sterilization;

Section 3 - giving descriptive information relating to the sub-category of "sterilized product" usually marketed under the specific designation of "STERILIZED PRODUCT";

Section 4 - giving descriptive information relating to the sub-category of "sterilized product" usually marketed under the specific designation of "UHT PRODUCT";

Section 5 - giving general information relating to the designated products.

APPENDIX A

IDF STATEMENT RELATING TO "PASTEURIZATION" AND "PASTEURIZED FLUID MILK PRODUCTS"

1. DEFINITIONS

1.1 Pasteurization

Is a process applied to a product with the object of minimizing possible health hazards arising from pathogenic micro-organisms associated with milk by heat treatment which is consistent with minimal chemical, physical and organoleptic changes in the product.

(NOTE: Pasteurization minimizes possible health hazards in the sense that, although it may not destroy all the pathogenic micro-organisms which may be present, it reduces the number of harmful micro-organisms to a level at which they do not constitute a significant health hazard.

Pasteurization also extends the keeping quality of some products by reducing the number of spoilage micro-organisms in the product.)

1.2 A Pasteurized Product

Is milk or a fluid milk product in accordance with Article 2 of the Code of Principles, which has been subjected to pasteurization; which if retailed as such has been cooled without delay and has then been packaged with minimum delay under conditions which minimize contamination. The product must give a negative phosphatase test immediately after heat treatment.

(NOTE: A pasteurized product as defined is one which has been pasteurized as such, as distinct from a product manufactured from milk, skimmed milk and/or cream which has been pasteurized. A negative phosphatase test is considered to be equivalent to less than 2.2 micrograms of phenol liberated by 1 ml of sample (IDF Standard 63: 1971) or less than 10 micrograms of p. nitrophenol liberated by 1 ml of sample (IDF Provisional Standard 82: 1978).)

2. EXAMPLES OF MINIMUM TEMPERATURE/TIME COMBINATIONS FOR PASTEURIZATION

The temperature/time combinations given are typical examples of many combinations of temperature and time having an equivalent and minimum bactericidal effect necessary for pasteurization. The combinations depend on such factors as the nature of the product, solids content, viscosity, *[*the initial bacterial load*]*, etc.

Pasteurized milk and skimmed milk	63ºC for 30 mins. 72ºC for 15 “
Pasteurized cream (18% fat)	75ºC for 15 “
(35% fat or more)	80ºC for 15 “
Pasteurized concentrated milk	80ºC for 25 “

In each case the product is cooled without delay to 10 C or below.

NOTE 1: Some countries have under domestic legislation more stringent requirements in respect of:

(i) temperature/time combinations;

(ii) the temperature below which the product must be cooled;

(iii) upper limits to the temperature of heat treatment, and conformity with a test for the presence of peroxidase.

NOTE 2: On the spelling of pasteurization

Most authorities, including the Oxford English Dictionary, spell pasteurization with "z" rather than "s". IDF has therefore adopted the spelling with "z" noting that the spelling with "s" may be used optionally.

APPENDIX B

IDF STATEMENT RELATING TO "STERILIZATION", AND TO "STERILIZED" AND "UHT" MILK AND FLUID MILK PRODUCTS

1. DEFINITIONS

1.1 Sterilization

Is a process applied to a product with the object of destroying all micro-organisms, or at least inhibiting the growth of any residual micro-organisms, by heat treatment at a temperature exceeding 100 C.

1.2 A Sterilized Product

Is milk or a fluid milk product in accordance with Article 2 of the Code of Principles which has been subjected to sterilization, either before or after packaging in a sealed container, and which satisfies the "Specification of Satisfactory Sample" given in Section 6 of International Standard IDF 48; 1969 Control Methods for Sterilized Milk.

2. EXAMPLES OF MINIMUM TEMPERATURE/TIME COMBINATIONS FOR STERILIZATION

The temperature/time combinations given are typical examples of many combinations of temperature/time having an equivalent and minimum bactericidal effect necessary for sterilization as defined in 1.1 in the preparation of a sterilized product as defined in 1.2. The combinations depend on such factors as the nature of the product, solids content, viscosity, etc.

Milk sterilized in-container	110ºC for 20 mins.
Cream sterilized in-container	116ºC for 20 mins.
Milk sterilized in continuous flow	132ºC for 1 s
Cream sterilized in continuous flow	132ºC for 2 s

plus in each case the additional heat treatment given in attaining and cooling from the sterilization temperature.

3. THE DESIGNATION "STERILIZED PRODUCT"

A product designated as a "STERILIZED PRODUCT" is a sterilized product which in general has been heat treated in the lower range of sterilization temperatures for a long time, traditionally in a sealed container, and which usually does not give turbidity when subjected to the modified turbidity test described in IDF Document 68 "Monograph on UHT Milk".

The designation is sometimes applied to products:

which have been similarly heat treated in continuous flow and subsequently aseptically packaged in sterile containers;

Or

which have been heat treated in continuous flow at higher temperatures for a shorter time, have been non-aseptically packaged, and finally heat treated in sealed containers in the lower range of temperature for a sufficiently long period for sterilization.

4. THE DESIGNATION 'UHT PRODUCT'

A product designated as a 'UHT PRODUCT' is a sterilized product which has been heat treated in continuous flow at a temperature of not less than 132ºC for a very short time, which has been aseptically packaged in sterile containers, and which has undergone minimum chemical, physical, or organoleptic change in relation to the severity of the heat treatment required for sterilization. Such a product usually gives turbidity when subjected to the modified turbidity test described in IDF Document 68.

5. GENERAL NOTE

In general those products designated as 'STERILIZED PRODUCTS' have had a severe heat treatment giving a relatively high degree of denaturation of whey protein, as may be indicated in the case of milk by a negative turbidity test, accompanied by changes in flavour; whereas products designated as 'UHT PRODUCTS' have had a less severe heat treatment giving a lower degree of denaturation of whey protein, as may be indicated in the case of milk by a positive turbidity test, and accompanied by less significant changes in flavour. There is however a tendency for some 'STERILIZED PRODUCTS' to have a leas severe treatment than normal for the product and for some 'UHT PRODUCTS' to have a more severe treatment than normal for the product leading to an overlap between the two types of sterilized products so that in some circumstances positive or negative turbidity tests may be obtained for either type of sterilized milk.

The legislation covering the processing of, for example, 'STERILIZED MILK', 'STERILIZED CREAM', 'UHT MILK' , 'UHT CREAM', varies from country to country. Some countries are specific in relation to minimum temperature/time combinations, others less so provided the sample fulfils certain test requirements for example a turbidity test, or a microbiological test. Where temperature/time combinations are specified they may vary from country to country. Furthermore in some countries 'STERILIZED MILK' may only be produced by in- container sterilization in particular types of packaging, whereas in others continuous flow sterilization and aseptic packaging is permissible.

Note : spelling of sterilization

Most authorities, including the Oxford English Dictionary, spell sterilization with 'z' rather than 'a'. IDF has therefore adopted the spelling with 'z' noting that the spelling with 's' may be used optionally.

B. Comments by Governments

The following comments on definitions of heat treatments have been received from the Governments of Czechoslovakia, Egypt, Finland, Hungary, Norway, Spain, Switzerland, Trinidad and Tobago, United Kingdom, United States.

Czechoslovakia refers to Appendix III of CL 1979/11 and states that for all quality indicators quoted in the definitions the binding control methods should be completed. In the general definition, it is not possible to refer to for instance IDF "Monograph on UHT Milk". All references to methods should comply with the methods approved of within the range of FAO/WHO Code of Principles.

They consider the definition "UHT-treated Milk" as so far not adequately exact. It is necessary to distinguish between the principle of the actual thermal treatment of the product and the quality of the aseptically packed product (for instance some milks treated by UHT method can be packed non-aseptically, as the durability of these products is substantially shorter as against aseptic packing).

Egypt

1. Pasteurization

The method of pasteurization used in all the plants of Egypt is the "High Temperature-Short time" (H.T.S.T.) process.

According to their legislation this process involves heating of liquid milk to temperature of 72ºC for 15 seconds and then immediate cooling to about 5ºC. The process should be such as to satisfy the test for the absence of phosphatase.

Owing to their environmental conditions, specially hot climate makes raw milk hygiene difficult to achieve and this raises the total count of bacteria, and spore-forming bacteria.

For this pasteurization temperature of 85ºC for 15 seconds and cooling to 7ºC or below are permitted, which will ensure the destruction of peroxidase and improve the keeping quality of the pasteurized milk.

2. In-Container Sterilization

The method of sterilization still used in all plants in Egypt is the batch sterilization in suitable containers. It is the process of heat treating the product in a sealed container to a temperature of 120ºC for at least 20 minutes which will ensure the destruction or inhibition of growth of any microorganisms.

In case of sterilized milk for human consumption, the heat treatment must be such that the milk shall pass the keeping quality tests and give no turbidity test.

3. U.H.T. Treated Milk

All theirplants will use for sterilising the milk the Ultra-High-Temperature-Process. (U.H.T.) milk has been subjected to continuous flow heating process by which milk is rapidly heated to 135ºC - 150ºC for a short time held for at least one second and then rapidly cooled to 10ºC - 15ºC.

This heat treatment must be such that U.H.T. milk shall:

1. Pass the keeping quality tests.
2. Give turbidity when subjected to the turbidity test.

Finland

1. Pasteurisation

Finland is of the opinion that the sentence: "The additional objective is to delay the onset of microbiological deterioration" is very important in the definition.

Furthermore, Finland has the opinion that the temperature of + 72ºC is enough for milk but not enough for cream with high fat content. In Finland the pasteurization temperature for high-fat cream (38%) is + 80-85ºC. They think also that it might be necessary to add the cooling temperature to the definition. So the last sentence in the pasteurization definition should be "For liquid milk for human consumption, this process would involve immediate cooling to a temperature +4 - +6ºC and packaging in such a fashion as to minimize post-processing contamination".

2. In-Container Sterilization

This method is not used in Finland, so we have no comments on it.

3. UHT Treated Milk

The minimum temperature and time used in Finland are +135ºC in 2 seconds and they think that it would be good to mention them in the definition. They think also that the wording "aseptically packaged" should be completed as follow: "aseptically packaged in sterile containers" to make sure that the packages are sterile.

In Hungary there are employed plate heat exchangers proper to second's time pasteurization heated by warm water. The Ministry of Public Health raised the following requirements:

- heating temperature of the milk should be 74-76ºC;
- time of heat treatment should be minimum 35 seconds;
- work of automatics and registrating equipment should be unobjectionable;
- pasteurized milk should be phosphatase negative.

Milk sterilizing equipment is not applied in Hungary.

The requirements on UHT process given by the Ministry of Agriculture and Food Industry are as follows:

- pre-heating temperature should be 70-80ºC (homogenization in two steps);
  - heat treatment at 142ºC;
- time of heat treatment should be 2-4 seconds;
- work of automatics and registrating equipment should be unobjectionable.

Norway

The following official definitions are in force in Norway:

1. High Pasteurization: heating momentarily to 80ºC.
2. Low Pasteurization: heating to 70-72ºC for at least 15 seconds.
3. Prolonged Pasteurization: heating to 62-63ºC for at least 30 minutes. This method is no longer relevant for milk and cream, etc.
4. There is no official definition for the UHT process, though two dairies in Norway have official approval to use a method for certain products based on the "steam in milk" principle - heating of the product to approx. 140ºC for max. 4 seconds.
5. Sterilized Milk and Cream shall be sterilized in hermetically sealed containers and otherwise satisfy the "canned food regulations".

Spain

Spanish law defines pasteurized milk as follows: "Pasteurized milk is natural milk which has undergone a process of heating tinder such conditions of temperature and time as will ensure the total destruction of pathogenic germs and almost all non-pathogenic germs, without any material change in its physico-chemical nature, biological characteristics or nutritional qualities".

To date, no distinction has been made in Spanish law between sterilized milk and UHT processed milk, the latter being included in the following definition of sterilized milk: "Sterilized milk is natural milk which has undergone a process of heating under such conditions of temperature and time as will ensure the destruction of germs and the inactivity of their forms of resistance".

Switzerland

1. General

In principle, a distinction must be made between general and specific definitions of the terms pasteurization, UHT processes and sterilization. To begin with, definitions should be limited to those usually applied to milk and milk products. Thereafter, specific definitions should be established with regard to milk and some milk products or groups of products. Unlike general definitions, specific definitions relating to particular products should include information as to technology, packaging and methods of control.

In Switzerland the only requirements prescribed by law are those concerning pasteurized milk and UHT processes. These requirements have now been revised in accordance with the principles set out above, and, at the same time, adapted to present technical levels. The requirements still in force, applicable to milk alone, are contained in the Ordonnance sur les denrées alimentaires (Foodstuffs Order).

2. Legal requirements in force

2.1 Pasteurization

Definition: "The designation "pasteurized" may only be applied to milk which has been properly heated shortly after milking, at the latest 24 hours afterwards, then rapidly pooled to a temperature of less than 5ºC, poured into containers with lids, and kept cools if it cannot be pasteurized within 24 hours the milk should be cooled to a temperature of less than 5ºC immediately after milking* In the case of immediate consumption, cooling

may be eliminated. This process will rid the milk of any pathogenic germs it nay contain, without its smell or its taste undergoing any appreciable change. It should also meet the conditions set out in Articles 39 et seq." According to the requirements mentioned at the end of the quotation, the raw milk should be faultless insofar as the proportion of its components, and its hygienic state, are concerned.

Permitted methods of pasteurization

High temperature heating at a minimum of 85ºC

Brief heating at 72-75ºC for a minimum of 15 seconds

Prolonged heating at 65ºC for a minimum of 30 minutes

Procedures other than those mentioned above must "be approved by the Federal Office for Public Health.

Requirements for pasteurized milk

Total number of germs at the time of leaving the place of pasteurization: 25,000/ml maximum

Total number of germs at the time of delivery to the consumer: 50,000/ml maximum

Coliforms: negative in 0.1 ml

Pathogenic germs capable of developing: absent

Phosphatase reaction: negative

Declaration

As well as the quantity of milk, the following information should be shown on closed containers:

"pasteurized", type of milk, producer's name or other indication of origin approved by the Federal Service of Public Hygiene, "to be kept cool and away from light", latest date on which the milk may be delivered to the consumer (fourth day after pasteurization).

2.2 UHT Processes

Definition: "UHT processes are distinguished by the use of special installations in which the milk is heated for several seconds to temperatures of 130-150ºC, which destroys the germs, followed by immediate cooling".

"Appellations such as 'UHT' or others making reference to very high temperature heating are not permitted if the UHT milk is subject after packaging to farther sterilization or similar processes reducing the advantages of UHT heating."

Length of conservation period permitted before delivery to consumers

"when filling is carried out aseptically, the conservation period before delivery to the consumer may be a maximum of 30 days without refrigeration but away from light."

"If milk heated by UHT processes is put into non-returnable containers, hermetically sealed, light-proof and gas-tight, conservation for up to four months is permitted."

Declaration

"UHT" or other description making reference to very high temperature heating, content, type of milk, producer or other indication of origin, date limit for delivery to the consumer.

2.3 Sterilization

There is no definition for sterilization of milk.

Trinidad and Tobago

The definitions of these processes in the Trinidad and Tobago Food and Drugs Regulations are quoted as follows:

1. "'Pasteurization' means the process of heating every particle of milk or milk products either:

(a) to a temperature of not less than 62.8ºC (145ºF) holding it at such temperature for a period of not less than 30 minutes, cooling it immediately thereafter to a temperature of 10.0ºC (50ºF) or lower; or

(b) to a temperature of not less than 71.7ºC (161ºF) holding it at such temperature for a period of not less than 15 seconds, cooling it immediately thereafter to a temperature of 10.0ºC (50ºF) or lower; and

'pasteurized' shall be construed accordingly."

2. "Sterilized Milk shall be milk, or a milk product, that has been heated to a temperature of at least 100ºC for a length of time sufficient to kill all the organisms present, and shall be delivered to the consumer in hermetically sealed containers …"

3. "Ultra Heat Treated, or U.H.T. Milk, shall be milk that has been heated at a temperature of 132.2ºC (270ºF) for a period of not less than one second. The following requirements shall be satisfied in its processing:

(a) any apparatus in which the milk is to be heated to and maintained at a temperature of not less than 132.2ºC (270ºF) shall be provided with a device which shall automatically divert the flow of any milk which is not raised to the authorized temperature;

(b) any indicating and recording thermometers as the Director shall reasonably consider necessary shall be installed in suitable places in the apparatus in which the milk is treated by the ultra high temperature method so as to indicate the temperatures to which the milk is heated;

(c) the records of recording thermometers shall be marked with graduations of 2ºF, adequately spaced to give clear readings, and they shall be dated and shall be preserved fox a period of not less than three months;

(d) a sample of milk taken in accordance with the official method from a batch of milk after treatment by the ultra high temperature method and before delivery to the consumer shall satisfy the colony count teat prescribed in the official method;

(e) milk which is treated by the ultra high temperature method shall immediately after such treatment be put into sterile containers in which it is to be supplied to the consumer. Such containers shall be filled and sealed at the premises at

which the treatment has "been carried out with such aseptic precautions as will ensure the protection of the milk from risk of contamination;

(f) every container in which milk treated by the ultra high temperature method is transported, exposed or offered for sale shall be so closed and securely fastened, either with a cap overlapping the lip of the container or in some other suitable manner approved by the Directory that the container is airtight."

United Kingdom

Provisions in England and Wales legislation concerning pasteurization, sterilization and ultra heat treatment in relation to milk are given below. Broadly similar provisions exist in Scotland and N. Ireland but the sale of sterilized and UHT milk is not permitted in the latter. It should be noted that account may need to be taken of the use of the terms for foods other than milk and milk products.

1. Pasteurization

Liquid milk for human consumption in England and Wales must be treated to not less than 62.8ºC and not more than 65.6ºC for at least 30 minutes or not less than 71.7ºC for at least 15 seconds. In each case there must be immediate cooling to not more than 10ºC. The milk must be packaged immediately after treatment in sealed containers. The process must be such as to satisfy the phosphatase test and the methylene blue test.

2. Sterilization

The liquid milk must be filtered, homogenized and then heated in bottles to a temperature of not less than 100ºC and maintained at this temperature for such a period as is necessary to enable it to comply with the turbidity test. On or before completion of the treatment the milk must be sealed with an airtight seal. Milk treated by the continuous flow method of sterilization must be packaged in sterile bottles and sealed at the premises of treatment. The process oust be such as to satisfy the colony count test.

3. UHT

The liquid milk must be heated to not less than 132.2ºC and retained at this temperature for not less than one second. Immediately after treatment the milk is packaged in sterile containers and sealed at the premises with an airtight seal* The process must be each as to satisfy the colony count test. Milk ultra heat treated by the direct application of steam must be so carried out that the percentages of milk fats and milk solids are the same after treatment as before it.

United States

The terms for which information is requested relative to national legislation are somewhat different in the U.S. when considering UHT process and sterilization. The UHT process, as used by some countries outside the U.S., encompasses what the U.S. has defined as ultrapasteurization as well as what the U.S. has defined as commercial sterility. Those products that are only ultrapasteurized are required to be refrigerated whereas non-refrigerated products in hermetically sealed containers must receive a heat treatment to effect commercial sterility.

In the U.S. UHT processed and/or commercially sterilized milk and milk products in hermetically sealed non-refrigerated containers are considered to "be low acid canned foods and must therefore comply with the requirements of 21 CFR 113 and 108. The U.S. definition for "commercial sterility" which is found in 21 CFR 113.3(e) is as follows:

"(e) 'Commercial sterility': (1) 'Commercial sterility' of thermally processed food means the condition achieved (i) by the application of heat which renders the food free of (a) microorganisms capable of reproducing in the food under normal non-refrigerated conditions of storage and distribution: and (b) viable microorganisms (including spores) of public health significance; or (ii) toy the control of water activity and the application of heat, which renders the food free of microorganisms capable of reproducing in the food under normal non-refrigerated conditions of storage and distribution."

The heat treatment utilized must be such that an adequate Fo heat treatment value will be achieved in each lot of product so as to assure the destruction of microorganisms and spores of public health significance.

National legislation providing definitions for pasteurization and ultrapasteurized processes are listed in the Coda of Federal Regulations, Title 21, Section 131.3 (b) and (c) as follows:

"(b) Pasteurization when used to describe a dairy product means that every particle of such product shall have been heated in properly operated equipment to one of the temperatures specified in the table of this paragraph and held continuously at or above that temperature for the specified time (or other time/temperature relationship which has been demonstrated to be equivalent thereto in microbial destruction):

Temperature	Time
145ºF	30 minutes
161ºF	15 seconds
191ºF	1 second
204ºF	0.05 second
212ºF	0.01 second

If the dairy ingredient has a fat content of 10 percent or more, or if it contains added sweeteners, the specified temperature shall be increased by 5ºF.

(c) Ultra-pasteurized when used to describe a dairy product means that such product shall have been thermally processed at or above 280ºF for at least 2 seconds, either before or after packaging, so as to produce a product which has an extended shelf life under refrigerated conditions."

APPENDIX III

IDF/ISO/AOAC Cooperation in the fields of sampling and analysis

1. Representatives of IDF, ISO and AOAC, met in Rome on 24 April 1982, to discuss progress on collaboration between the three organizations with special reference to methods of analysis required for the Code of Principles concerning milk and milk products.

Present:

Dr. H. Werner (Chairman)	IDF
Dr. H.W. Kay	IDF
Mr. F.F.J. Staal	IDF
Mr. S. Boelsma	ISO
Drs. L.J. Poortvliet	ISO
Drs. H.W. Schipper	ISO
Dr. J.H. Nelson	AOAC
Mrs. M. Tuinstra-Lauwaars	AOAC
Dr. R.W. Weik	AOAC
Mr. K.P. Andersen (*)	Chairman, Committee of Government Experts
Dr. F. Wihkelmann (*)	FAO

* Present for part of the session only.

2. Joint IDF/ISO/AOAC standards submitted to the 20th Session of the Committee of Government Experts

Submitted to the Committee at step c

2.1 Milk and milk products - copper content (International IDF Standard 76A: 1980)
2.2 Milk and milk products - iron content (Provisional International IDF Standard 103: 1981)
2.3 Caseins and caseinates - scorched particles (as a parameter for sediment) (Provisional IDF Standard 107: 1982)
2.4 Milk freezing point (thermistor cryoscope) (Provisional IDF Standard 108: 1982)
2.5 Skimmed milk, whey and buttermilk - fat content (ISO/DIS 7208)
2.6 Milk and milk products - sampling (attribute sampling schemes) (**) (Appendix VI)
2.7 Milk, cream and evaporated milk - total solids content (Appendix VI)
2.8 Sweetened condensed milk - total solids content (Appendix VI)
2.9 Cheese and processed cheese - total solids content (Appendix VI)

Submitted to the Committee for action at Step g

2.10 Milk and milk products - methods of sampling (revision of FAO/WHO Standard B1) (Draft International Standard ISO/DIS 707)
2.11 Caseins and caseinates - pH (International Standard ISO 5546)
2.12 Caseins and. caseinates - lactose content (Provisional IDF Standard 106: 1982)
2.13 Cheese and proteased cheese - total phosphorus content (revision of FAO/WHO Standard B12) (Appendix VI)
2.14 Milk - fat content (revision of FAO/WHO Standard B6) (Revision of ISO/R 1121 - 1970 and IDF IA: 1969)

** Submitted as a revised text to replace Appendix XIII, Report of the 17th Session.

Note

Edible ices and ice mixes fat content ISO/DIS 7328: this method is submitted to the FAO/WHO Secretariat for relay to the Codex Committee on Methods of Analysis and Sampling.

Submitted to the Committee for action at Step h

2.15 Caseins and caseinates - free acidity
2.16 Caseins and caseinates - water content
2.17 Rennet casein and caseinates - ash content
2.18 Caseins - fixed ash content
2.19 Caseins and caseinates - protein content
2.20 Milk and milk products - lactose content in the presence of other reducing substances
2.21 Dried milk - titratable acidity

Some editorial changes based on comments from Governments were introduced in the text of the above methods and these changes were communicated to the FAO/WHO Secretariat for inclusion in the 8th Edition of the Code,

3. Requests submitted by Governments for the development of methods not -or not yet -directly required under the Code

3.1 Determination of the presence of lard in processed cheese: the Joint IDF/ISO/AOAC Group E49 will be asked to study this request;

3.2 Determination of the use of recombined milk: the three organizations did not visualize the feasibility of developing such a method in the foreseeable future;

3.3 Determination of formaldehyde in cheese (especially Provolone): a draft method ought to be submitted by Italy;

3.4 Identification of UHT treated milk: the results of the deliberations of the Milk Committee in respect of the proposed definitions for heat treatments should be awaited,

4. General

4.1 Revision of methods appearing in the Code: it is proposed that revised texts of those methods already appearing in the Code should be submitted by IDF/ISO/AOAC to the Milk Committee at step (f) of the procedure, in the context of results of collaborative tests carried out on such methods;

4.2 It was suggested by the three organizations, that, from the analytical point of view, parameters for which it is currently impossible to develop reliable methods of analysis, should not be included in compositional standards in the Code.

4.3 The three organizations decided to meet once a year as a tripartite session to review the progress made in the joint development of methods of analysis and to report annually on the progress to the Secretariat of the Milk Committee.

APPENDIX IV

"DECISION No. 6"

In countries where it is not prohibited to manufacture and/or sell for human consumption an imitation product, defined as:

> "a substitute for milk or for a milk product which in general composition, appearance, characteristics and intended use is similar to milk, or to a product as defined and/or standardized under Articles 1, 2 or 3 of the FAO/WHO Code of Principles Concerning Milk and Milk Products, and in which the milk solids constituents are wholly or partly replaced with non-milk ingredient(s)".

the following provisions shall apply: An imitation products

1. shall meet the essential compositional requirements of the milk or corresponding milk product, apart from the nature of the constituents being replaced;
2. shall not contain additions other than those used in the corresponding milk product, except for harmless additives technologically necessary for the replacement and optional additional nutrients as appropriate;
3. shall be produced under hygienic conditions;
4. shall conform to the hygienic quality standards and to such maximum levels of contaminants normally applicable to the corresponding milk product;
5. shall be labelled in acoordance with:
   (i) Article 4 of the Code of Principles and shall preferably be designated according to Article 4.2(b) rather than Article 4.2(a) and furthermore, if a distinct name is used, it should conform with Article 4.1 and should not be suggestive of a milk product.
   (ii) The FAD/WHO Codex Alimentarius Commission recommended "International General Standard for the Labelling of Prepackaged Foods".
   (iii) The appropriate sections of the standard for the corresponding milk product in other respects."

Note: In formulating the "Decision No. 6" recognition is given to the fact that Article 4.2(a) which makes provision for the use of the word 'imitation' in front of the name of the product is now deprecated by IDF.

APPENDIX V

PRESERVATION OF RAW MILK QUALITY BY ACTIVATION OF A NATURAL ANTIBACTERIAL SYSTEM IN THE MILK

(Document Prepared by Sweden)

The most extensively used method to preserve raw milk quality is cooling. Farm tanks with efficient electrical cooling and insulated bulk tanks for transportation is nowadays a standard in most regions with advanced dairying. However, the cooling system is highly depending on a proper supply of electricity. Thus, in Sweden 98 % of the milk is cooled and stored in farm tanks operated by electricity from only a few transforming stations. The milk is collected at 48 h interval. Consequently, a widespread fall out of electricity supply would have a dramatic effect on the quality of the raw milk due to none or insufficient cooling. None or insufficient cooling is however the persisting situation in many parts of the world because of various reason, such as lack of capital, electricity, roads etc. Preservation of raw milk quality in these regions is often further complicated by the prevailing high ambient temperatures.

In such cases, when technical and/or economic reasons do not allow the adoption of cooling facilities, the joint FAO/WHO expert committee on food additives (24th Report 1980) considered, that hydrogen peroxide could be used for milk prior to further processing without any health hazard. However, there are some disadvantages with this method, viz:

- High concentrations (up to 800 ppm) of hydrogen peroxide is required, giving a general oxidation effect on milk components.
- Considerable difficulties to apply the method under practical conditions.
- Residual hydrogen peroxide have to be removed by catalase treatment prior to processing.

Consequently, a more suitable chemical or biochemical method for preserving raw milk quality would be beneficial.

Based on research, carried out at the National Institute for Research in Dairying, England, and the Swedish University of Agricultural Sciences, a new method for preserving the quality of milk at ambient temperature has been developed in Sweden. The method makes use of a naturally occurring antibacterial system in milk, known as the lactoperoxidase (LP) system. The enzym lactoperoxidase alone has no antibacterial effect, but it catalyses the oxidation of the ion thiocyanate in the presence of low concentration of hydrogen peroxide, which leads to the formation of antibacterial compounds as follows:

$$SCN^- + H_2O_2 \xrightarrow{LP} \text{antibacterial compounds.}$$

These antibacterial compounds thus formed has been shown to have a highly specific antibacterial activity.

Recent investigations have shown, that the lactoperoxidase/thiocyanate system in saliva acts in the same manner as in milk to produce the antibacterial compound and is considered to be one of the anticaries factors in saliva.

Thiocyanate is a naturally occurring compound in milk. The concentration varies and is depending on the feeding of the cow, but it is usually too low for optimum activity of the lactoperoxidase system. Therefore, in most cases about 10 ppm of thiocyanate Has to be added.

For optimum activity the concentration of hydrogen peroxide should be about 8.5 ppm, which is much lower than the concentration used in the approved method of preserving milk with hydrogen peroxide.

The practical application of the method is simple. Since only a minute amounts of hydrogen peroxide is necessary to activate the LP-system in milk a solid peroxide, viz. sodium percarbonate, can be used as the source of hydrogen peroxide. The activating substances can be handled in prepacked bags adjusted for the volume of milk to be treated, e.g. size of the cans. The proper use of the method can be easily controlled by measuring the thiocyanate level in the delivered milk.

The hydrogen peroxide is momentarily and completely used up in the reaction. The formed antibacterial compounds are slowly breaking down and any residues are completely decomposed at the pasteurization. Part of the thiocyanate will remain in the pasteurized milk, which will contain about 10 ppm of thiocyanate. This slight increase in the thiocyanate content of milk is considered to be harmless.

It should be noted, that thiocyanate is a naturally occurring metabolite in man. The concentration for instance in saliva has been reported to be 37 to 155 ppm. In vegetables for consumption up to 200 ppm has been found. However, in order to investigate any physiological effects of these increase in the thiocyanate of milk, a clinical test is being carried out in Sweden. In this trial, 45 persons are consuming 400 cc of milk daily, which has been activated according to the method, using a somewhat increased concentration of thiocyanate, 20 ppm. The investigation is carried out in cooperation between the Swedish University of Agricultural Sciences, the National Food Administration and the Department of Medicin at the University Hospital of Uppsala. The results do not indicate any harmful effect of the treated milk on the consumer. This could also be expected from the current knowledge of thiocyanate metabolism in man.

The National Food Administration in Sweden has approved the method to be used when a fall out of electricity would result in spoilage of milk due to none or insufficient cooling.

The method has been tested under field condition in tropical countries, e.g. Kenya and Sri Lanka. The results indicate, that morning milk, which is activated within 2 hours after milking, could be kept for 7-8 hours at 30-32ºC without bacterial multiplication. This means, that using the method morning milk could be collected at ambient temperatures in these regions. A similar activation of evening milk, in combination with water cooling to 15-20ºC, enables storage overnight without bacterial deterioration.

Summary

The characteristics of the new method could be summarized as follows.

- The method makes use of a natural antibacterial system in the milk. The antibacterial effect is specific towards the bacterial cells compared with the general oxidation effect when the traditional hydrogen peroxide method is used.
- The hydrogen peroxide added in the new method is only 8.5 ppm compared to up to 800 ppm in the traditional method. Application of the method in practise is simple and any misuse is easily detectable.
- The functional, organoleptic and nutritional properties of milk is not influenced.
- With the new method a good quality of raw milk could be preserved while poor quality milk can't be improved.

APPENDIX VI - A

Such of the methods which had been submitted to Governments for comments at Step c and g and which were not published elsewhere, are contained in this Appendix.

MILK AND MILK PRODUCTS - SAMPLING -(ATTRIBUTE SAMPLING SCHEMES)

0. INTRODUCTION

The sampling theory used in this standard is based on classifying a unit as "good" or "defective". A "good" unit is one which meets the requirements of a standard or specification; a "defective" unit is one which does not. It is essential that the sample is taken at random; if this is not done then the sampling schemes will not give the protection stated on the tables. See Appendix A.

The statistical terms used are in accordance with ISO 3534 "Statistics - Vocabulary and symbols".

1. SCOPE AND FIELD OF APPLICATION

1.1 This standard shall be used to choose a sample size for any situation where it is required to measure the conformity to a standard, or specification of a consignment of any dairy product by means of the examination of a representative sample. It is intended for use by whoever instructs the sampling agent. The techniques of sampling for dairy products are detailed in IDF Standard 50A : 1980 which shall be consulted before the samples are taken.

1.2 This standard is applicable to the sampling of all dairy products where it is required to measure the conformity to a standard or specification of material submitted in discrete consignments, whether or not the consignments are from the same production. The acceptance or otherwise of any consignment is a matter for the parties to a contract and is outside the scope of this standard.

1.3 This standard shall be used in all cases where attribute sampling schemes are required for any dairy product, except that if specific compositional standards, specifications or contracts include different sample schemes, those schemes should be used.

1.4 This standard shall not be used for microbiological defects, unless otherwise agreed by the interested parties.

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2. REFERENCES

IDF 50A : 1980 Milk and Milk Products - Sampling
ISO 3534 - 1977 Statistics - Vocabulary and Symbols
ISO 2859 - 1974 Sampling procedures and tables for inspection by attributes
" " Addendum 1 - 1977. General Information on sampling inspection, and guide to the use of the ISO 2859 tables.

3. ISO 2859 SAMPLING SCHEMES

ISO 2859 describes schemes for use in all situations, and gives an account of the theoretical background to the sampling tables. The schemes are indexed by batch size and Acceptable Quality Level (AGL). AQL is defined in paragraph 4 of ISO 2859 and in paragraph 20 of Addendum 1; it can be considered to be the average level of quality which if maintained by a producer would result in the acceptance of most of his production.

4. PREFERRED AQLs FOR CRITICAL, MAJOR & MINOR DEFECTS

4.1 As defined in ISO 2859 - 1974 (para. 2) a critical defect is likely to cause hazardous conditions for individuals using the product. A major defect is one that is likely to make the product unfit for use; in this case unfit for sale to the consumer. A minor defect is a failure to comply with a standard or specification which does not make the unit unfit for use.

4.2 Critical Defects

These relate, within the scope of this standard, to the presence of toxic contaminants at a critically high level. Examples include heavy metals and residues of pesticides.

In this case the method to be adopted shall be that described in paragraph 9 of Addendum 1 to ISO 2859, which is reproduced in this standard as Appendix B. It is necessary to decide on an acceptable risk of not detecting a certain percentage of defectives, where a defective is a unit which contains more than the critical level of the contaminant. It is impossible to guarantee freedom from contamination.

4.3 Major Defects

A major defect is one which would result in the product spoiling or becoming unfit for sale or processing. Examples include :

a) Composition where this affects keeping quality

b) Contamination with inhibitory substances

c) Integrity of packaging

d) Visible contamination with dirt.

Sampling schemes for major defects shall be selected from the tables using an AQL of not more than 6.5%.

4.4 Minor Defects

A minor defect is a defect which causes the unit in question to fall outside a specification or standard but which does not make the unit unfit for sale nor cause it to spoil. Examples include:

a) A unit, the chemical composition or net content of which falls outside but close to a specification limit

b) Small abnormalities in appearance.

Sampling schemes for minor defects shall be selected from the tables using an AQL of not more than 10%.

5. CLASSIFICATION OF DEFECTS

Any sampling scheme drawn up in accordance with this standard shall clearly define all critical, major and minor defects in such a way that they are unambiguously understood by all users of the standard, specification contract or other document which includes the sampling scheme.

6. SELECTION OF SAMPLING SCHEME

The sampling scheme shall be selected from the tables, using the lot size and the agreed AQL In these tables, n = sample size, Ac = maximum number of defects permitted in the sample, Re = minimum number of defects required in the sample to reject the lot. So n = 13, Ac = 0, Re = 1 means that if a sample of 13 units contains no defectives the lot shall be accepted; if the sample contains I defective the lot shall be rejected.

Lot size		n	Ac	Re
				AQL=1.0%
Up to	1 200	13	0	1
1 201 to	35 000	50	1	2
35 001 to	500 000	80	2	3
More than	500 000	125	3	4
				AQL=2.5%
Up to	90	5	0	1
91 to	1 200	20	1	2
1 201 to	10000	32	2	3
10 001 to	35 000	50	3	4
35 001 to	500 000	80	5	6
More than	500 000	125	7	8
				AQL = 4.0%
Up to	90	3	0	1
91 to	500	13	1	2
501 to	1 200	20	2	3
1 201 to	10 000	32	3	4
10 001 to	35 000	50	5	6
35 001 to	500 000	80	7	8
More than	500 000	125	10	11
				AQL=6.5%
Up to	25	2	0	1
26 to	150	8	1	2
151 to	500	13	2	3
501 to	1 200	20	3	4
1 201 to	10000	32	5	6
10 001 to	35 000	50	7	8
35 001 to	500 000	80	10	11
More than	500 000	125	14	15

				AQL= 10%
Up to	90	5	1	2
91 to	150	8	2	3
151 to	500	13	3	4
501 to	1 200	20	5	6
1 201 to	10 000	32	7	8
10 001 to	35 000	50	10	11
35 001 to	500 000	80	14	15
More than	500 000	125	21	22

These tables are taken from ISO 2859, which includes full Operating Characteristics. It also includes sampling schemes and switching rules for Tightened and Reduced Inspection; normally the schemes given above shall be used.

7. RECORDS

Successful operation of this type of sampling control requires the maintenance of comprehensive records of the results of inspection, and the scheme in use. Interchange of information between both parties would be useful, and it is recommended that each party should make such information available to the other as required.

8. SELECTION OF UNITS

8.1 The sampling theory used for the schemes in ISO 2859 which this standard recommends assumes that sample units are selected at random, which means that each unit in the sample should have the same probability of appearing in the sample. Every effort must be made to obtain a random sample. Whenever possible a formal randomization procedure as described in Clause 15 of Addendum No. 1 to ISO 2859 should be used. (See Appendix C). If this is not done, the risks associated with the schemes cannot be assumed to be those expected. Formal randomization is not difficult, although it can be tedious and time-consuming.

8.2 This standard describes two methods of selecting units at random. In each case the units are numbered in some pre-determined way and a table of random numbers is used to select the units corresponding to the numbers.

8.3 If the sample has to be drawn from goods stacked in a store, then the units can conveniently be numbered with reference to three co-ordinates with origin at one corner of the store. The random numbers can then be considered as the co-ordinates of the units to be drawn.

8.4 A simpler method is to draw the sample at a point past which all the consignment is moving sequentially; for instance when loading or unloading. Then random number i would correspond to the i^{th} unit to pass the point.

APPENDIX A

STATISTICAL THEORY

1. The sampling plans included in ISO 2859, from which these plans are drawn, are based on either Poisson or Binomial distribution theory.

   Binomial distribution is used for the smaller sample sizes, and Poisson distribution for those schemes where this distribution is an adequate approximation to the Binomial. Paragraph 11.1 of ISO 2859 gives more details.

2. It is only necessary to satisfy two requirements in order to use the sampling theory. Firstly, an individual unit can only be "good" or "defective" as defined in section O. Secondly, the sample must be drawn at random as defined in section 8. It is not necessary to make any assumptions about the distribution of defectives within the lot.

APPENDIX B

Section 9 of Addendum No 1 to ISO 2859 - 1974

CRITICAL DEFECTS

Critical defects form a special category. It is impossible to choose any value of per cent defective for these defects and say, "This percentage of defectives is tolerable."

The solution generally adopted, where non-destructive inspection is involved, is to lay down that critical features are to be inspected using a sample size equal to the lot size and an acceptance number of zero. This is 100 % inspection, but it should be noted that it is not the traditional 100% sorting. Here there is no attempt to sort the articles into the good and the bad but an attempt to check that there are no bad ones. If a critical defective is found, this does not merely mean that it is put into a different box and the inspection continues; it means that the whole lot is rejected (although rejection does not necessarily mean scrapping — see clause 11). Whenever possible, it should also mean that production is stopped while a thorough investigation takes place to attempt to discover how the defect arose and to devise methods to prevent another occurrence. The reason for this procedure is to try to prevent the production of critical defectives and to avoid giving the manufacturer the impression that as the inspector will sort them out for him it will not matter too much if he produces some. Even the best inspector may occasionally fail to notice a defect, so it is only by preventing critical defectives from being made that it can be ensured that none will get through to the customer.

If it is ever thought that any particular critical defect does not warrant this procedure, then serious consideration should be given to having it reclassified as a major defect. Critical defects really must be critical; then no amount of effort is too great.

According to the definition of a critical defect in ISO 2859, this classification should be used for a defect that is likely to cause hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product. The wording "is likely to" is important. There is sometimes a tendency to replace these words by "could possibly" and hence to classify everything as critical, since it is always possible to make up a story in which some trivial happening at the beginning leads to catastrophe at the and. If this approach is adopted, the main result is to devalue the critical classification, and the genuine critical? may not be treated as severely as they should be.

The critical classification is also available for a defect that is *likely* to prevent performance of the practical function of a *major* end item. Again the italicized words are important if the critical classification is not to be devalued.

Where the only possible Inspection for critical defects is destructive, the search for ways of preventing them from ever being made at all is even more important. In this case, we cannot have a sample which is 100% of the lot, and it is necessary to decide what sample should be taken for inspection for critical defects. This can be done using a simple formula connecting the per cent defective for which, if it were present, we would wish to be almost certain of finding at least one defective in the sample, the sample size, and the risk we are prepared to take of failing to find a defective.

The formula is

$$\text{Sample size} = \frac{\text{a factor depending upon the risk}}{\text{percent defective it is wished to detect if present.}}$$

The factor in the numerator of this formula depends upon the risk of failing to find a defective in the sample, as follows :

Risk	Factor[1)]
1 in 10	230,26
1 in 100	460,52
1 in 1 000	690,78
1 in 10 000	921,04
1 in 100 000	1 151,30
1 in 1 000 000	1 381,56

1) The factor for other values of the risk if required, can be calculated as $230.25 \log_{10} \left(\frac{1}{\text{risk}}\right)$

As found from this formu!a, the sample size will often not be a whole number. It is best to round up to the next higher whole number, rather than round to the nearest whole number.

The acceptance number is, of course, always zero in this context.

This formula is accurate only for small values of per cent defective, say, not greater than 10, but this is not disadvantageous since it is never wished to consider high values of per cent defective for critical defects anyway.

If the formula were used for, say, 20 % or 50 % defective, it would over-estimate the sample size needed.

> *Example 5 :* For a certain product, inspection for critical defects is destructive, and it is decided That if a lot were to contain as many as 2 % of critical defectives a risk of only 1 in 10 000 should be taken of failing to find a defective in the sample. The formula gives
>
> $$\text{Sample size} = \frac{921,04}{2} = 460,52$$

The sampling plan for criticals is

Sample size	:	461
Acceptance number	:	0 defective
Rejection number	:	1 defective

An alternative plan for critical defects, where the defect is something that can be measured rather than a pure attribute, is to sample with a safety margin. Thus, if the minimum allowable breaking toad for some component were 2 000 kg, it might be possible, instead of saying that the limit was 2 000 kg and the defect was critical, to say that the limit was 2 500 kg and the defect was major. Just where the limits should be set, and what plan is allowable, depends upon some past knowledge of the amount of variability observed in the strength of the components in question. When this approach is possible, it can give much more satisfactory results for at! concerned than seeking for critical defectives (and hoping that there are none present) can do

APPENDIX C

Section 15 of Addendum No. 1 to ISO 2859-1974

15 DRAWING OF SAMPLES

In acceptance sampling, a lot is sentenced on the quality of a sample. If this is to be a rational procedure, it is obviously important that the sample should be representative of the lot, and not a biased sample in any way. Some inspectors pride themselves on their ability, given a lot from which to draw a sample, to pick all the bad ones. If the purpose is to demonstrate that there are some bad ones, or to improve the lot by rejecting the bad ones found, then this ability is a desirable characteristic. But it is not what is required here. For a correct sentencing of the lot, it is desired that the sample be of the same quality as the lot - neither better nor worse.

Now, there is no known way of ensuring that the sample is just the same quality as the lot, unless the quality of the lot is already known, in which case there would be no need to draw a sample to sentence it. There are, however, sampling methods which give unbiased samples in the sense that, although some samples will be worse and some better than their lots, on the average they will be just right and only the inevitable variability of sampling will lead to discrepancies. Furthermore, these methods allow one to calculate the variability of the sample in relation to the quality of the lot, and it is upon these calculations that the drawing of O.C. curves depends.

Such a method is simple random sampling: alt possible samples of the required size have an equal chance of being the sample drawn. The tables describing the sampling plans presume that the samples (single, double or multiple) are drawn following this method. It is very important that this is in fact the case.

> *Example 8* : Suppose the lot size is 4, and the sample size is 2.
>
> If each item in the lot is given a letter of the alphabet as its "name", the lot consists of the four items A, B, C and D. There are six possible ways of making up the sample size of 2.
>
> These are :
>
> A and B
> or A and C
> or A and D
> or B and C
> or B and D
> or C and D
>
> and for simple random sampling, each of these six possibilities must be given an equal chance. In this particular case, an ordinary six-sided die could be thrown to choose A and B if the dice showed one pip, A and C if two pips, and so on.

In the example just given, the problem of simple random sampling is relatively easily solved, since the numbers involved were deliberately chosen to be very small, leading to only six possibilities for the sample. But it is clear that the number of possibilities very rapidly increases as lot size and sample size increase. For instance, for a sample of 5 from a lot of 20, there are 15 504 possibilities, for a sample of 7 from a lot of 30 there are over 2 million possibilities, for a sample of 10 from a lot of 50 there are over 10 thousand million, and these are still fairly small sample sizes and lot sizes. It is clear therefore that simple random sampling, with lot sizes and sample sizes such as those most often used

in practice, is not easy, but an attempt must be made to make as nearly random a choice as possible.

The one really vital requirement is that the entire lot must be presented to the inspector for him to draw the sample. Cases have been heard of where a manufacturer has offered an inspector a ready-made sample while keeping back the rest of the Sot, and cases even where a manufacturer has offered the sample as soon as the number of articles in the sample size had been made, informing the inspector that the remainder of the lot would not be manufactured until the sampling results wart known. Clearly, in such circumstances there is no reason to suppose that the sample is in any way representative of the lot, and no lot should ever be sentenced on the basis of such a sample.

It must be made clear that this does not prohibit the submission of a pre-production sample. It is quite common and reasonable for the manufacturer to submit, or be required to submit, a sample before bulk production starts, for approval of the article he is intending to produce. This is not the same thing as the submission of a sample for acceptance or rejection of a lot.

Sometimes it is possible to give each article in the lot a number, either physically by writing the number on it or beside it, or mentally by some device such as noting that "Article No. 124" means "1st row, 2nd box, 4th article inside the box". If this can be done it is then possible to draw a random sample by using a table of random numbers. An example of such a table is given as table 1.

> *Example 9* : A sample size of 8 is to be drawn from a tot of 5 000. The articles in the lot are labelled with numbers from 1 to 5 000, and starting at the top of the first column of table I, the articles to be drawn for the sample are numbers 110, 4 148, 2 403, 1 828, 2 267, 2 985, 4 313 and 4 691 (the numbers 5 327, 5 373, 9 244 etc. are ignored since corresponding articles would not be found in the lot).

Three points should be noted with regard to the use of a table of random sampling numbers :

a) it is not correct always to start at the top of the first column. For each sample to be drawn, the best procedure is to sun from where the previous sample finished and thus work through the table;

b) it is permissible, having worked through the table, to return to the beginning and work through again, but it is better, if possible, to proceed to a new table rather than to repeat the old one;

c) there is no need to read the numbers as having four figures. If the lot size were 1 000 or less, the first three figures would be adequate, and would be read as 11,532,537, etc. Sometimes two figures are enough, sometimes more than four are required. As many or as few as desired may be combined.

There is nothing really difficult about the use of random numbers, provided that the articles can be numbered, but it is often argued that their use is not worth the trouble, and an intuitively random sample is as good. In many cases it may be, but the intuitively random sample is often very far from being random in fact. For example, people drawing items, supposedly at random, from a box will usually draw too many from the middle and the corners will not be adequately represented. When it is pointed out that they are taking too few from the comers, they will then often start to take too many from the corners. The simple randomness of giving every combination an equal chance is very

elusive, and the extra trouble of using random numbers where possible is undoubtebly worth white.

It must be recognized, however, that the use of random numbers is not always easy. If the lot consists of a large box of small articles, it may be quite impracticable to give each one a number. In such circumstances, intuitively random sampling is probably all that can be done, but if intuition is modified by knowledge of what would be done if it were possible, this will help to obtain better results. Knowing that every possible combination must have an equal chance makes it clear at once that the articles must be taken out of the box to make them all equally available before the sample is drawn, and also that any apparent quality of the articles should be ignored. There must not be deliberate choosing of articles which appear good or bad.

There is one alternative to simple random sampling which is allowable, indeed desirable, where appropriate, and it may be used whether or not random numbers are used. This alternative is known as stratified sampling.[1)] This is appropriate whenever a lot can be split into sub-lots according to some logical criterion. Note that the criterion must be a logical one; splitting into sub-lots at random will not help. The sample is drawn by taking a sub-sample from each sub-lot proportionate in size to the size of the sub-lot. The sub-samples must be drawn at random from within the sub-lot (using random numbers, if possible) and finally the sub-samples are combined to make up the complete sample before inspection. However, see clause 28 for a warning about difficulties thay may arise if two or more sources of supply are mixed.

> *Example 10* : A sample of 125 is to be drawn from a lot which has been delivered in two boxes, half the lot being in each box. It is decided to make each box a sub-lot. A sample of 62 is drawn from one box and of 63 from the other, these two samples being combined to form the required sample of 125. (The box to supply the one extra unit should preferably be chosen at random.)
>
> If, instead of each box containing half the lot, one box had contained two-thirds and the other one-third, then 83 would have been drawn from the first box and 42 from the second, as being the nearest whole numbers to two-thirds and one-third of 125.

When using double or multiple sampling, it is occasionally convenient to draw the first sample at random and inspect it, then draw the second sample if required, and so on. In this case, the random sampling techniques are as described above, and no extra difficulty arises. But sometimes it is more convenient to draw at once the maximum sample that might be required and divide it into first sample, second sample, etc., before inspection. In this case, it is most important that, in addition to drawing a sample at random from the lot to make up the maximum sample, the first, second, etc., samples be drawn at random from the maximum sample. It is particularly important to remember this point when stratified sampling is used; it would be quite wrong for instance to allow all the first sample to come from the same sub-lot.

[1] Referred to as "representative sampling" in ISO 2859.

TABLE 1 (part 1) - Random sampling numbers

0110	9140	2804	8046	7142	6277	6210	8627	3209	6845
5327	3946	6289	6117	0060	2827	6546	2738	8760	6604
5373	8259	4956	8185	0135	8640	7410	6335	0831	2774
9244	9452	8324	8062	9817	9853	7479	9559	4264	6919
4148	3948	5399	8687	3568	4046	4558	0705	5075	4440
2403	4351	8240	3554	3568	4701	7494	6036	7735	4082
1828	1956	1646	1370	9096	0738	8015	0513	6969	0949
7249	9634	4263	4345	0567	1272	5302	3352	7389	9976
7116	9731	2195	3265	9542	2808	1720	4832	2553	7425
6659	8200	4135	6116	3019	6223	7323	0965	8105	4394
2267	0362	5242	0261	7990	8885	0375	7577	8422	5230
9460	9813	8325	6031	1102	2825	4899	1599	1199	0909
2985	3541	6445	7981	8796	9480	2409	9456	7725	0183
4313	0666	2179	1031	7804	8075	8187	6575	0065	2170
6930	5368	4520	7727	2536	4166	7653	0448	2560	4795
8910	3585	5655	1904	0681	6310	0568	3718	3537	8858
8439	1052	5883	9283	1053	5667	0572	0611	0100	5190
4691	6787	4107	5073	8503	6875	7525	8894	7426	0212
1034	1157	5888	0213	2430	7397	7204	6893	7017	7038
7472	4581	3837	8961	7931	6351	1727	9793	2142	0816
2980	7419	6874	1128	5108	7643	7335	5303	2703	8793
1312	7297	3848	4767	5386	7361	2079	3197	8904	4332
8734	4921	6201	5057	9228	9938	5104	6662	1617	2322
2907	0737	8496	7509	9304	7112	5528	2390	7736	0475
1294	4883	2536	2351	5860	0344	2595	4880	5167	5370

TABLE 1 (part 2) - Random sampling numbers

0430	5819	7017	4512	8081	9198	9786	7388	0704	0138
5632	0752	8287	8178	8552	2264	0658	2336	4912	4268
7960	0067	7837	9890	4490	1619	6766	6148	0370	8322
5138	6660	7759	9633	0924	1094	5103	1371	2874	5400
8615	7292	1010	9987	2993	5116	7876	7215	9714	3906
4968	8420	5016	1391	8711	4118	3881	9840	5843	0751
9228	3232	5804	8004	0773	7886	0146	2400	6957	8968
9657	9617	1033	0469	3564	3799	2784	3815	3611	8362
9270	5743	8129	8655	4769	2900	6421	2788	4858	5335
8206	3008	7396	0240	0524	3384	6518	4268	5988	9096
1562	7953	0607	6254	0132	3860	6630	2865	9750	9397
1528	4342	5173	3322	0026	7513	1743	1299	1340	6470
5697	9273	8609	8442	1780	1961	7221	5630	8036	4029
3186	0656	3248	0341	9308	9853	5129	3956	4717	7594
3275	7697	1415	5573	9661	0016	4090	2384	7698	4588
7931	1949	1739	3437	6157	2128	6026	2268	5247	2987
5956	2912	2698	5721	1703	2321	8880	3288	7420	2121
1866	7901	4279	4715	9741	2674	7148	8392	2497	8018
2673	7071	4948	8100	7842	8208	3256	3217	8331	7256
7824	5427	0957	6076	2914	0336	3466	0631	5249	7289
2251	0864	0373	7808	1256	1144	4152	8262	4998	3315
7661	8813	5810	2612	3237	2829	3133	4833	7826	1897
6651	6718	1088	2972	0673	8440	3154	6962	0199	2604
2917	4989	9207	4484	0916	9129	6517	0889	0137	9055
5970	3582	2346	8356	0780	4899	7204	1042	8795	2435

TABLE 1 (part 3) - Random sampling numbers

1564	8048	6359	8802	2860	3546	3117	7357	9945	5739
6022	9676	5768	3388	9918	8897	1119	9441	8934	8555
8418	9906	0019	0550	4223	5586	4842	8786	0855	5650
5948	1652	2545	3981	2102	3523	7419	2359	0381	8457
6945	3629	7351	3502	1760	0550	8874	4599	7809	9474
0370	1165	8035	4415	9812	4312	3524	1382	4732	2303
6702	6457	2270	8611	8479	1419	0835	1866	1307	4211
3740	4722	3002	8020	0182	4451	9389	1730	3394	7094
3833	3356	9025	5749	4780	6042	3829	8458	1339	6948
8683	7947	4719	9403	7863	0701	9245	5960	9257	2588
6794	1732	4809	9473	5893	1154	0067	0899	1184	8630
5054	1532	9498	7702	0544	0087	9602	6259	3807	7276
1733	6560	9758	8586	3263	2532	6668	2888	1404	3887
6609	6263	9160	0600	4304	2784	1089	7321	5618	6172
3970	7716	8807	6123	3748	1036	0516	0607	2710	3700
9504	2769	0534	0758	9824	9536	7825	2985	3824	3449
0668	9636	6001	9372	8746	1579	6102	7990	4526	3429
4364	0606	4355	2395	2070	8915	8461	9820	6811	5873
8875	3041	7183	2261	7210	6072	7128	0825	8281	6815
4521	3391	6695	5986	2416	7979	8106	7759	6379	2101
5066	1454	9642	8675	8767	0582	0410	5515	2697	1575
9138	5003	8633	2670	7575	4021	0391	0118	9493	2291
0975	1836	7629	5136	7824	3916	0542	2614	6567	3015
1049	9925	3408	3029	7244	1766	1013	0221	8492	3801
0682	1343	7454	8600	8598	9953	5773	6482	4439	6708

TABLE 1 (part 4) - Random sampling numbers

0263	4909	9832	0627	1155	4007	0446	6988	4699	1740
2733	3398	7630	3824	0734	7736	8465	0849	0459	8733
1441	2684	1116	0758	5411	3365	4489	6241	6413	3615
5014	5616	1721	8772	4605	0388	1399	5993	7459	4445
3745	5956	5512	8577	4178	0031	3090	2296	0124	5896
8384	8727	5567	5881	3721	1896	3758	7236	6860	1740
9944	8361	7050	8783	3815	9768	3247	1706	9355	3510
3045	2466	6640	6804	1704	8665	2539	2320	9831	9442
5939	5741	7210	0872	3279	3177	6021	2045	0163	3706
4294	1777	5386	7182	7238	8408	7674	1719	9068	9921
3787	2516	2661	6711	9240	5994	3068	5524	0932	5520
4764	2339	4541	5415	6314	7979	3634	5320	5400	6714
0292	9574	0285	4230	2283	5232	8830	5662	6404	2514
7876	1662	2627	0940	7836	3741	3217	8824	7393	7306
3490	3071	2967	4922	3658	4333	6452	9149	4420	6091
3670	8960	6477	3671	9318	1317	6355	4982	6815	0814
3665	2367	8144	9663	0990	6155	4520	0294	7504	0223
3792	0557	8489	8446	8082	1122	1181	8142	7119	3200
2618	2204	9433	2527	5744	9330	0721	8866	3695	1081
8972	8829	0962	5597	8834	5857	9800	7375	9209	0630
7305	8852	1688	3571	3393	2990	9488	8883	2476	9136
1794	4551	1262	4845	4039	7760	1565	4745	1178	8370
3179	1304	7767	4769	7373	5195	6013	6894	5734	5852
2930	3828	7172	3188	7487	2191	1225	7770	3999	0006
8418	9627	7948	6243	1176	9393	2252	0377	9798	8648

APPENDIX VI - B

MILK, CREAM AND EVAPORATED MILK - DETERMINATION OF THE TOTAL SOLIDS CONTENT

(Reference Method)

1. SCOPE

This reference method specifies the determination of the total solids content of milk, cream and evaporated milk.

2. REFERENCE

IDF Standard 50A: 1980 Milk and Milk Products - Guide to Sampling Techniques.

3. DEFINITION

Total solids content: the mass remaining after completion of the heating process described below.

The total solids content is expressed as a percentage by mass.

4. PRINCIPLE OF METHOD

The total solids content as defined under paragraph 3 is determined by evaporating the water from the sample at a temperature of 102ºC in a drying oven.

5. APPARATUS AND MATERIALS

5.1 Analytical Balance

5.2 Desiccator provided with efficient drying agent (e.g. freshly dried silica gel with hygrometric indicator).

5.3 Drying oven, ventilated, thermostatically controlled, operating at 102 ± 1ºC throughout the total working space.

5.4 Flat-bottom dishes, height 20 to 25 mm, diameter 50 to 75 mm, of appropriate material (e.g. stainless steel, nickel or aluminium), provided with well-fitting, readily removable lids.

5.5 Water bath with adjustable control from 30-60ºC.

5.6 Homogenizer

6. SAMPLING

See IDF Standard 50A: 1980

7. PREPARATION OF SAMPLE

7.1 Milk

Bring the sample to a temperature of 20-25ºC. Mix thoroughly to ensure a homogeneous mixture of the fat throughout the sample. Do not agitate so vigorously as to cause frothing of the milk or churning of the fat.

If it is found difficult to disperse the cream layer, warm slowly to 35-40ºC with careful mixing and incorporating any cream adhering to container. Cool the sample quickly to 20-25ºC. If desired, a homogenizer may be used to assist the dispersion of the fat.

NOTE: Correct results cannot be expected if the sample contains separated liquid fat or separate visible irregularly shaped white particles adhering to the walls of the container.

7.2 Cream

Bring the sample to a temperature of 20-25ºC. Mix or stir the cream thoroughly but not so vigorously as to cause frothing or churning. If the cream is very thick, warm to 30-40ºC to facilitate mixing and then cool the sample quickly to 20-25ºC. In order to reduce evaporation of water to a minimum during the mixing, the container should be uncovered for as short a time as possible.

NOTE: Correct results cannot be expected if adequate mixing of the sample is not achieved or if the sample shows any evidence of churning or any other signs of abnormality,

7.3 Evaporated Milk

Shake and invert the container. Open the container, pour the milk slowly into a second container (provided with an airtight lid) and mix by repeated transfer taking care to incorporate in the sample any fat or other constituent adhering to the wall and ends of the first container. Finally transfer the milk as completely as possible to the second container. Close the container. If necessary, temper unopened original container in water bath at 40-60ºC. Remove and shake can vigorously every 15 mins. After 2 hs. remove can and let cool to 20-25ºC. Remove entire lid and thoroughly mix by stirring contents in original container with spoon or spatula (if fat separates, do not test the sample).

8. PROCEDURE

8.1 Heat the open dish and lid in the oven at 102 ± 1ºC for at least 1 h. Place the lid on the dish and remove from oven.

8.2 Allow the closed dish to cool in the desiccator to room temperature (at least 30 min.) and weigh to 0,1 mg.

8.3 Quickly weigh to 0,1 mg, 2,5 to 3 g of the prepared sample in the dish. In the case of milk or cream, tilt dish to spread sample evenly over bottom surface of dish. In the case of evaporated milk add 3-5 ml water, tilt dish to mix and spread sample evenly over bottom surface of dish.

8.4 Heat open dish and lid in the oven at 102 ± 1ºC for 2 h. Place the lid on dish and remove from oven.

8.5 Allow the closed dish to cool in the desiccator to room temperature (at least 30 min) and weigh to 0,1 mg.

8.6 Heat open dish and lid in the oven for 1 h. Place the lid on dish and remove from oven. Cool in the desiccator and weigh as in 8.5.

8.7 Repeat 8.6 until the difference in mass between two successive weighings is not more than 1 mg. Use lowest mass for calculation.

9. EXPRESSION OF RESULTS

9.1 Method of Calculation and formula

Calculate the total solids content, as a percentage by mass, using the formula:

$$T = \frac{m_2 - m_0}{m_1 - m_0} \times 100$$

where:

T is the percentage by mass of total solids in the sample

m_0 is the mass, in grains, of the dish at stage 8.2

m_1 is the mass, in grams, of the dish at stage 8.3

m_2 is the mass, in grams, of the dish at stage 8.7

Round the value obtained for the total solids content to the nearest 0,01%

9.2 Precision

9.2.1 Repeatability

The difference between two single results found on identical test material by one analyst using the same apparatus within a short time interval shall exceed *[*0,10 g*]* of solids per 100 g of product on average not more than once in 20 cases in the normal and correct operation of the method.

9.2.2 Reproducibility

The difference between two single and independent results found by two operators working in. different laboratories on identical test material shall exceed *[*0,20 g*]* of solids per 100 g of product on average not more than one in 20 cases in the normal and correct operation of the method.

10. TEST REPORT

The test report shall show the method used and the result obtained; it shall also mention all operating conditions not specified in this International Standard, or regarded as optional; as well as any circumstances that may have influenced the result.

The report shall include all details necessary for complete identification of the sample.

Note. Figures in square brackets *[ ]* are tentative, pending the result of a collaborative study.

APPENDIX VI - C

SWEETENED CONDENSED MILK DETERMINATION OF THE TOTAL SOLIDS CONTENT

(Reference method)

1. SCOPE

This reference method specifies the determination of the total solids content of sweetened condensed milk.

2. REFERENCE

IDF Standard 50A:1980 Milk and Milk Products - Guide to Sampling Techniques

3. DEFINITIO

Total solids content the mass remaining after completion of the heating process described below. The total solids content is expressed as a percentage by mass.

4. PRINCIPLE OF METHOD

The total solids content as defined under paragraph 3 is determined by evaporating the water from the sample in the presence of sand at a temperature of 102ºC in a drying oven.

5. APPARATUS AND MATERIALS

5.1 Analytical balance.

5.2 Desiccator provided with efficient drying agent (e.g. freshly dried silica gel with hygrometric indicator).

5.3 Drying oven, ventilated, thermostatically controlled operating at 102 ± 1ºC throughout the total working space.

5.4 Flat-bottom dishes, height 20 to 25 mm, diameter 50 to 15 mm, of appropriate material (e.g. stainless steel, nickel or aluminium), provided with well-fitting, readily removable lids.

5.5 Boiling water bath or steam bath.

5.6 Water bath with adjustable control from 30-40ºC.

5.7 Quartz sand or sea sand which passes through a woven wire cloth sieve with nominal size of aperture of 500 µm but is retained by a sieve with a nominal size of aperture of 180 µm which complies with the following suitability test:

5.7.1 Put approximately 20 g of sand in a dish with stirring rod. Heat the opened dish with sand, stirring rod and lid in the oven at a temperature of 102 ± 1ºC for at least 2 h. Allow the closed dish to cool in the desiccator to the temperature of the balance room and weight to 0,1 mg.

5.7.2 Moisten the sand with approximately 5 ml of water, mix sand and water with rod and heat dish, lid and rod at least 4 h in the oven. Weigh again as above. The difference between the two weighings shall not exceed 0,5 mg.

NOTE - If this requirement is not met, the sand can be made suitable for the determination as follows.

Leave the sand immersed in hydrochloric acid 25% (m/m) for three days. Stir occasionally. Decant the supernatant liquid as far as possible. Then wash the sand with water until the acid reaction has disappeared.

Heat the sand at approximately 160ºC for at least 4 h. Then repeat the test on the suitability of the sand as above.

5.8 Short glass stirring rods flattened at one end and fitting into the dish (5.4).

6. SAMPLING

See IDF Standard 50A: 1980.

7. PREPARATION OF SAMPLE

Open the container and thoroughly mix the milk with a spoon or spatula. Use an up and down rotary movement in such a way that the top layers and the contents of the lower corners are moved and mixed.

Take care to incorporate in the sample any milk adhering to the wall and ends of the container. Transfer the milk as completely as possible to a second container (provided with an air-tight lid). Close the container.

If necessary, temper unopened can in water bath at 30-40ºC. Open, scrape out all milk adhering to interior of can, transfer to dish large enough to permit stirring thoroughly, and mix until whole mass is homogeneous. In case of a collapsible tube, open and transfer the contents to a jar. Cut open the tube and scrape out all material adhering to the interior and transfer to the jar.

8. PROCEDURE

8.1 Heat a dish (5.4) containing approximately 25 g of sand (5.7), with its lid alongside and a stirring rod (5.8) on top of the lid, in the drying oven (5.3) at 102 ± 1ºC for 1 h.

8.2 Place the lid (with the stirring rod on top) on the dish, immediately transfer the dish to a desiccator (5.2) and allow to cool for at least 45 min, and weigh the dish, with lid and rod, to 0.1 mg.

8.3 Tilt the sand to one side of the dish, place on a clear space about 2.0 g of the prepared sample (7), replace the lid with the stirring rod on top and weigh the dish to 0;1 mg.

8.4 Add 5 ml of distilled water to the test portion in the dish and mix with the stirring rod. Thoroughly mix together the diluted test portion and the sand, and spread the mixture evenly over the bottom of the dish. Leave the stirring end of the rod in the mixture with the other end resting on the rim of the dish.

8.5 Heat the dish on the boiling water bath (5.5), with as much as possible of the bottom of the dish exposed to the steam, for approximately 30 min, stirring the mixture frequently in the early stages of drying so that the mixture is well aerated and becomes crumbly.

8.6 Lay the stirring rod flat inside the dish, dry the bottom of the dish and heat the dish, with its lid alongside, in the drying oven at 102 ± 1ºC for 2 h.

8.7 Place the lid on the dish and allow the dish to cool and then weigh it, as described in 8.2.

8.8 Heat the dish and lid as described in 8.6 but for 1 h, place the lid on the dish, and allow the dish to cool and then weight it, as described in 8.2.

8.9 Repeat the operations described in 8.8 until the difference in mass at two successive weighings is not more than 0,5 mg. Record the lowest mass as the mass of the dish at this stage.

9. EXPRESSION OF RESULTS

9.1 Method of calculation and formula

Calculate the total solids content of the laboratory sample using the formula:

$$T = \frac{m_2 - m_0}{m_1 - m_0} \times 100$$

Where

T is the total solids content, as % (m/m) ;

m_0 is the mass, in grams, of the dish at stage 8.2

m_1 is the mass, in grams, of the dish at stage 8.3

m_2 is the mass, in grams, of the dish at stage 8.9

Round the value obtained for total solids content to the nearest 0,1%.

9.2 Precision

9.2.1 Repeatability

The difference between two single results found on identical test material by one analyst using the same apparatus within a short time-interval shall exceed *[*0,10 g *]* of solids per 100 g of product on average not more than one in 20 cases in the normal and correct operation of the method.

9 .2. 2 Reproducibility

The difference between two single and independent results found by two operators working in different laboratories of identical test material shall exceed *[*0.20 g*]* of solids per 100 g of product on average not more than once in 20 cases in the normal and correct operation of the method

10. TEST REPORT

The test report shall show the method used and the result obtained; it shall also mention all operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details necessary for complete identification of the sample.

Note. Figures in square brackets *[ ]* are tentative, pending the result of a collaborative study.

APPENDIX VI - D

CHEESE AND PROCESSED CHEESE DETERMINATION OF THE TOTAL SOLIDS CONTENT

(Reference method)

1. SCOPE

This reference method specifies the determination of the total solids content of cheese and processed cheese. It may not be applicable to Process Cheese Preparations as defined in the Codex Code of Principles Standard A-8(c).

2. REFERENCE

IDF Standard 50A:1980 Milk and Milk Products - Guide to Sampling Techniques.

3. DEFINITION

Total solids content mass remaining after completion of the heating process described below. The total solids content is expressed as a percentage by mass.

4. PRINCIPLE OF METHOD

The total solids content as defined under paragraph 3 is defined by evaporating the water from the sample mixed with sand at a temperature of 102 C in a drying oven,

5. APPARATUS AND MATERIALS

5.1 Analytical balance.

5.2 Desiccator provided with efficient drying agent (e.g. freshly dried silica gel with hygrometric indicator).

5.3 Drying oven, ventilated, thermostatically controlled, operating at 102 ± 1ºC throughout the total working space.

5.4 Flat-bottom dishes, height 20 to 25 mm, diameter 50 to 75 mm, of appropriate material (e.g. stainless steel, nickel or aluminium), provided with well fitting, readily removable lids.

5.5 Short glass stirring rods, flattened at one end and fitting into the dish (5.4).

5.6 Quartz sand or sea sand which passes through a woven wire cloth sieve with nominal size or aperture of 500 µm but is retained by a sieve with a nominal size of aperture of 180 µm which complies with the following suitability test:

5.6.1 Put approximately 20 g of sand in a dish with stirring rod. Heat the opened dish with sand, stirring rod and lid in the oven at a temperature of 102 ± 1ºC for at least 2 h. Allow the closed dish to cool in the desiccator to the temperature of the balance room and weigh to 0,1 mg.

5.6.2 Moisten the sand with approximately 5 ml of water, mix sand and water with rod and heat dish, lid and rod at least 4 h in the oven. Weigh again as above. The difference between the two weighings shall not exceed 0,5 mg.

NOTE - If this requirement is not met, the sand can be made suitable for the determination as follows.

Leave the sand immersed in hydrochloric acid 25% (m/m) for three days. Stir occasionally. Decant the supernatant liquid as far as possible. Then wash the sand with water until the acid reaction has disappeared.

Heat the sand at approximately 160ºC for at least 4 h. Then repeat the test on the suitability of the sand as above.

5.7 Appropriate devices for grating, grinding or mixing the cheese.

6. SAMPLING

See IDF Standard 50A: 1980.

7. PREPARATION OF SAMPLE

Prior to analysis, remove the rind or smear or mouldy surface layer of cheese, in such a way as to provide a sample representative of the cheese as it is usually consumed. Grind or grate the sample by means of an appropriate device; mix the ground mass quickly, and if necessary, for semihard and hard cheeses grind a second time and again mix thoroughly. If the sample cannot be ground or grated, mix it thoroughly by intensive stirring. Care should always be taken to avoid moisture loss.

Transfer the test sample to an air-tight container to await analysis, which should be carried out as soon as possible after grinding. If delay is unavoidable, take all precautions to ensure proper preservation of the sample and to prevent condensation or moisture on the inside surface of the container. Ground cheese showing unwanted mould growth or beginning to deteriorate should not be examined.

Clean the device after grinding each sample.

8. PROCEDURE

8.1 Heat a dish (5.4) containing approximately 25 g of sand (5.6), with its lid alongside and a stirring rod (5.5) on top of the lid, in the drying oven (5.3) at 102 ± 1ºC for 1 h.

8.2 Place the lid (with the stirring rod on top) on the dish, immediately transfer the dish to a desiccator (5.2) and allow to cool for at least 45 min, and weigh the dish, with lid and rod, to 0.1 mg.

8.3 Tilt the sand to one side of the dish, place on the clear space about 3,0 g of the prepared sample (7), replace the lid with the stirring rod on top and weigh the dish to 0,1 mg.

8.4 Thoroughly mix together the test portion and the sand, and spread the mixture evenly over the bottom of the dish. Leave the stirring end of the rod in the mixture with the other end resting on the rim of the dish.

NOTE 1. Mixing of sand and hard cheeses may be facilitated by adding sufficient distilled water (approximately 3 ml) to saturate the sand.

NOTE 2. With cheeses which melt to a horn-like mass at a temperature of 102ºC, it is recommended that the dish containing the crushed cheese mass shall first be heated on water or steam bath, exposing maximum surface of dish bottom to direct steam. The contents of the dish shall be thoroughly mixed with the glass rod from time to time to prevent the formation of a hardened surface layer.

8.5 Lay the stirring rod flat inside the dish, dry the bottom of the dish and heat the dish, with its lid alongside, in the drying oven at 102 ± 1ºC for 2 h.

8.6 Place the lid on the dish, and allow the dish to cool and then weigh it, as described in 8.2.

8.7 Heat the dish and lid as described in 8.5 but for 1 h, place the lid on the dish, and allow the dish to cool and then weigh it, as described in 8.2.

8.8 Repeat the operations described in 8.7 until the difference in mass at two successive weighings is not more than 0,5 g. Record the lowest mass as the mass of the dish at this stage.

9. EXPRESSION OF RESULTS

9.1 Method of calculation and formula

Calculate the total solids content of the laboratory sample using the formula:

$$T = \frac{m_2 - m_0}{m_1 - m_0} \times 100$$

Where

T is the total solids content, as % (m/m)

m_0 is the mass, in grams, of the dish at stage 8.2

m_1 is the mass, in grams, of the dish at stage 8.3

m_2 is the mass, in grams, of the dish at stage 8.8

Round the value obtained for total solids content to the nearest 0,1%.

9.2 Precision

9.2.1 Repeatability

The difference between two single results found on identical test material by one analyst using the same apparatus within a short time-interval shall exceed *[*0,10 g*]* of solids per 100 g of product on average not more than once in 20 cases in the normal and correct operation of the method.

9.2.2 Reproducibility

The difference between two single and independent results found by two operators working in different laboratories on identical test material shall exceed *[*0,20 g*]* of solids per 100 g of product on average not more than once in 20 cases in the normal correct operation of the method.

NOTE. Figures in square brackets *[ ]* are tentative, pending the result of a collaborative study.

10. TEST REPORT

The test report shall show the method used and the result obtained; it shall also mention all operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details necessary for complete identification of the sample .

APPENDIX VI - E

Cheese and processed cheese products - Determination of total phosphorus content - Photometric method

1. Scope and field of application

This International Standard specifies a photometric method for the determination of the total phosphorus content of cheese. The method is applicable to all kinds of cheeses and to processed cheese products.

2. References

IDF 50A: 1981, Milk and milk products - Methods for sampling. ISO 707, Milk and milk products - Methods for sampling.

3. Definition

Total phosphorus content of cheese or a processed cheese product: the content of substances determined by the procedure described in this International Standard and expressed as a percentage by mass.

4. Principle

Digestion of the cheese by sulphuric acid and hydrogen peroxide. Formation of molybdenum blue by addition of sodium molybdate and ascorbic acid. Photometric measurement of the blue colour at a wavelength of 820 nm. Calculation of the total phosphorus content from the measured absorbance.

5. Reagents

All reagents shall be of analytical quality. The water used shall be distilled or deionized, free from phosphorus compounds.

5.1 Concentrated sulphuric acid (H_2SO_4), P_{20}, 1,84 g/ml.

5.2 Hydrogen peroxide solution, about 30% (m/m) H_2O_2.

5.3 Molybdate ascorbic acid solution.

5.3.1 Sodium molybdate solution.

Dissolve 12,5 g of sodium molybdate dihydrate ($Na_2MoO_4.2H_2O$) in sulphuric acid 5 mol/1 to a volume of 500 ml and mix.

5.3.2 Ascorbic acid solution.

Dissolve 10 g of ascorbic acid ($C_6H_8O_6$) in water to a volume of 200 ml and mix.

5.3.3 Immediately before use, mix 25 ml of solution 5.3.1 with 10 ml of solution 5.3.2. Dilute to 100 ml with water and mix.

NOTE - This solution cannot be stored.

5.4 Phosphate standard solution (100 µg P/ml) .

Dry for at least 48 h about 1 g of potassium dihydrogen phosphate (KH_2PO_4) in a desiccator over an efficient drying agent, e.g. concentrated sulphuric acid.

Dissolve 0,4394 g of the dried phosphate in water to a volume of 1.000 ml and mix.

6. Apparatus

All glassware shall be thoroughly cleaned with a phosphorus free detergent and rinsed with distilled water,

6.1 Analytical balance.

6.2 Device for grinding or grating cheese, capable of being easily cleaned.

6.3 Boiling water bath.

6.4 Micro gas burners.

NOTE - The use of electric heaters is also allowed.

6.5 Digestion flasks (Kjeldahl) of 25 ml capacity.

6.6 Glass beads.

6.7 Graduated cylinders of 5 and 25 ml capacity.

6.8 Volumetric flasks of 50 and 100 ml capacity, complying with ISO 1042, class B.

6.9 One-mark pipettes, delivering 1, 2, 5 and 10 ml, complying with ISO 648, class A, or ISO/R 835.

NOTE - where appropriate, burettes may be used instead of pipettes.

6.10 Spectrophotometer operating at a wavelength of 820 nm, equipped with cells of 10 mm optical path length.

7. Sampling

7.1 See IDF 50A : 1981.
See ISO 707.

7.2 Store the sample in such a way that deterioration and change in composition are prevented.

8. Procedure

8.1 Preparation of the test sample.

Remove the rind or mouldy surface layer of the cheese, in such a way as to provide a sample representative of the cheese as it is usually consumed. Grind or grate the sample by means of an appropriate device (6.2). Mix the ground or grated mass quickly, and if possible grind or grate a second time and again mix thoroughly.

If the sample cannot be ground or grated, mix it thoroughly by intensive stirring and kneading.

Transfer the test sample to an air-tight container to await analysis, which should be carried out as soon as possible after grinding or grating. If delay is unavoidable, take all precautions to ensure proper preservation of the sample and to prevent condensation of moisture on the inside surface of the container. The storage temperature should be 10 to 12 C.

Clean the device after grinding or grating the sample.

8.2 Determination

8.2.1 Weigh into a digestion flask (6.5) about 0,5 g of the test sample, to the nearest 1 mg. Add three glass beads and 4 ml of concentrated sulphuric acid.

8.2.2 Operating under a well ventilated fume hood, place the flask in an inclined position and heat with a micro burner. Control the height of the flame, so as to limit the production of foam in the flask. Foaming into the neck of the flask is allowed but the foam shall not escape.

Keep the mixture gently boiling. Avoid local overheating and heating the flask above the surface of the liquid contents.

8.2.3 As soon as the foaming stops, cool to room temperature. Carefully add some drops of the hydrogen peroxide solution and reheat.

Repeat this procedure until the contents have become clear and colourless. During heating, mix the contents from time to time by careful swirling. Avoid local overheating.

8.2.4 Rinse the neck of the flask with about 2 ml of water. Heat the contents again until the water has been evaporated.

Allow the liquid to boil for 30 min. in order to destroy traces of hydrogen peroxide. Avoid local overheating.

8.2.5 Cool to room temperature. Transfer the liquid contents into a 100 ml volumetric flask. Make up to the mark with water and mix well.

8.2.6 Pipette 1 ml of the solution into a 50 ml volumetric flask and dilute with about 25 ml of water. Add 20 ml of the molybdate ascorbic acid solution (5.3). Make up to the mark with water and mix well.

8.2.7 Place the flask in a boiling water bath and allow the colour to develop for 15 min.

8.2.8 Cool to room temperature in cold water. Within one hour, measure the absorbance of the solution against that of the blank (8.4) at a wavelength of 820 nm.

8.3 Calibration curve

8.3.1 Pipette 10 ml of the standard solution (5.4) into a 100 ml volumetric flask. Make up to the mark with water and mix well.

8.3.2 Pipette into a series of five 50 ml volumetric flasks 0 (blank), 1, 2,5 and 10 ml of the diluted standard solution (8.3.1). Dilute with water to a volume of about 25 ml.

8.3.3 Add to the contents of each volumetric flask 20 ml of the molybdate ascorbic acid solution (5.3). Make up to the marks and mix well. Proceed as described in 8.2.7.

8.3.4 Cool to room temperature in cold water. Within one hour, measure the absorbance of each solution against that of the blank of the series (8.3.2) at a wavelength of 820 nm.

8.3.5 Plot these absorbances against the amounts of phosphorus added.

8.4 Blank test.

Carry out a blank test as described in 8.2 but without test portion.

9. Expression of results

9.1 Method of calculation.

Calculate the total phosphorus content of the sample, as percentage by mass, from:

$$\frac{m_1}{100\ m_0}$$

where

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in micrograms, of phosphorus, read from the calibration curve (or calculated from the regression line obtained by the least squares method).

Report the result to the second decimal place.

9.2 Repeatability.

The difference between two single results obtained on identical test material by one analyst using the same apparatus within a short time interval will exceed 0,03 g of phosphorus per 100 g of product on average not more than once in 20 cases in the normal and correct operation of the method.

9.3 Reproducibility.

The difference between two single and independent results obtained by two operators working in different laboratories on identical test material will exceed 0,06 g of phosphorus per 100 g of product on average not more than once in 20 cases in the normal and correct operation of the method.

10. Test report:

The test report shall show the method used and the result obtained. It shall also mention all operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details necessary for complete identification of the sample.

APPENDIX VII

Amendments of International individual cheese standards, C-2, C-3, C-6, C-7, C-24, C-25 and C-26 proposed by Denmark

C-2 Danablu

Replace 4.3.1 b) and c) by the following:

b) Flat square, height 8-15 cm.

c) Flat rectangular, height 8-15 cm.

Replace in 4.3.2 b) and c) the words "4 kg approx." by "minimum 2 kg".

Replace 4.7 and 4.8 by the following:

"4.7/4.8 Limits for fat in dry matter, moisture and dry matter content"

	A Danablu	B 60% Danablu
Minimum fat in dry matter, %	50	60
Maximum moisture content, %	48	42
Minimum dry matter content, %	52	58

C-3 Danbo

Change 4.3.2 to: "4.3.2 Weights: minimum approx. 6 kg".

Change the scheme in 4.7/4.8 to the following:

	A Danbo	B 30% Danbo
Minimum fat in dry matter, %	45	30
Maximum moisture content, %	47	53
Minimum dry matter content, %	53	47

In 4.9 and 6.1 delete the reference to "Mini Danbo"

In 7 replace the second section by the following:

"The cheese mentioned under B in 4.7/4.8 may be designated "Danbo" provided the designation is accompanied by the prefix "30%". The presence of cumin seed shall be declared on the label as part of the designation of the cheese".

and delete the third section.

C-6 Havarti

In 3.2.2 Optional Additions replace the words "cumin seed" by "cumin seed or other vegetable seasonings" and add "smoke or smoke extracts (aqueous)".

Change 4.3.1 to the following:

a) Flat cylindrical: Various dimensions, min. height 10 cm, by small cheeses at least half of the diamter.

b) Rectangular (loaf): Various dimensions, square cross-section, length more than double height.

c) Flat square: Various dimensions, min. height 10 cm.

Change 4.3.2 to the following:

a) Flat cylindrical: Min. 0.2 kg. For 30% Havarti min. 2.0 kg.

b) Rectangular (loaf): Min. 0.2 kg. For 30% Havarti min. 2.0 kg.

c) Flat square: Min. 2.0 kg.

After 4,4.3 Colour: Delete the words "in flat square shape".

Change the scheme in 4.7/4.8 to the following:

	A Havarti	B 30% Havarti	C 60% Havarti
Minimum fat in dry matter, %	45	30	60
Maximum moisture content, %	48	53	39
Minimum dry matter content, %	52	47	61

In paragraph 7 delete the first sentence in section 2 and add the following as section 3:

"The presence of cumin seed or other vegetable seasonings shall be declared on the label as part of the designation of the cheese."

C-7 Samsoe

In 4.2, 4.3.1 and 4.3.2 delete "c) rectangular".

In 4.3.1, 4.3.2, 4.7/4.8, 4.9 and 6.1 delete the provisions for "Mini Samsoe".

After 4.4.3 insert a note: Samsoe cheese is also manufactured without rind.

In 4.7/4.8 change the maximum moisture content in 30% Samsoe to 50% and the minimum dry matter content to 50%.

In paragraph 7 delete the second sentence in section 2 and section 3 in total and insert the following:

"The presence of cumin seed shall be declared on the label as part of the designation of the cheese".

C-24 Maribo

In 4.2 (b) add "or rectangular".

Replace the text in 4.3.1 Dimensions by the following:

(a) Flat cylindrical: Diameter 4 cm.
(b) Flat square or rectangular: Minimum side length approx. 30 cm, height approx. 10 cm.

Replace the text in 4.3.2 Weights by the following:

(a) Flat cylinder: Approx. 14 kg
(b) Flat square or rectangular: Approx. 9 kg or more.

Include in the note after 4.4.3 the words "or rectangular" after ".... in flat square ...."

Replace the table in 4.7/4.8 by the following:

	A Maribo	B 30% Maribo
Minimum fat in dry matter	45	30
Maximum moisture content, %	43	49
Minimum dry matter content, %	57	51

In 4.9 delete the last sentence.

Replace the second section of paragraph 7 by the following:

"The cheese mentioned under B in 4.7/4.8 may be designated Maribo provided that the designation is accompanied by a prefix "30%"."

C-25 Fynbo

Delete the provision for cumin seed in 3.2.2 and 7 (third section).

Replace the text in 4.3.1 Dimensions by the following:

"Proportion between height and diameter between 1 : 4 and 1:3. For "Mini Fynbo" approx. 1 : 2."

Replace the text in 4.3.2 Weights by the following:

(a) From 4 to 15 kg.

(b) "Mini Fynbo" from 0.2 to 1.5 kg

Replace the maximum moisture contents in 4.7/4.8 by the following:

"A: 45%, B: 52%, and C: 47%"

and the minimum dry matter content accordingly.

C-26 Esrom

Include in 3.2.2 "Cumin seed or other vegetable seasonings" and "Smoke or smoke extracts (aqueous)".

Change 4.3(d) to the following:

Weights:	Length and width:
more than 2.0 kg	various

Change in 4.7/4.8 maximum moisture to A: 49% and B: 41%.

In paragraph 7 add the following:

"The presence of cumin seeds or other vegetable seasonings must be declared on the label as part of the designation of the cheese."

C-32 Certain Blue-Veined Cheeses

In order to bring the specific provision for Danablu in accordance with the standard C 2 replace in 4.3.2.1 the words "approx. 4 kg" by "min. 2 kg", and replace the text under the scheme under 4.7/4.8 by the following:

> "The minimum fat content in dry matter for Danablu are restricted to those given under A and B, and the moisture content in 60% Danablu must not exceed 42%".

codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

REPORT OF THE 20TH SESSION OF THE JOINT FAO/WHO COMMITTEE OF GOVERNMENT EXPERTS ON THE CODE OF PRINCIPLES CONCERNING MILK AND MILK PRODUCTS

CORRIGENDUM TO ENGLISH VERSION ONLY

Please amend the temperature/time combinations given for Pasteurized milk, Skimmed milk, Pasteurized cream and Pasteurized concentrated milk given in paragraph 2, Appendix A, Page 29 of the above Report to read as follows:

Pasteurized milk and skimmed milk	63ºC for 30 mins. 72ºC for 15 secs.
Pasteurized cream (18% fat)	75ºC for 15 secs.
(35% fat or more)	80ºC for 15 secs.
Pasteurized concentrated milk	80ºC for 25 secs.

The following reports of earlier sessions have been issued: in this series

First session, Rome, Italy, 8-12 September 1958
(Meeting Report No. 1958/15)

Second session, Rome, Italy, 13-17 April 1959
(Meeting Report No. 1959/AN-2)

Third session, Rome, Italy, 22-26 February 1960
(Meeting Report No. AN 1960/2)

Fourth session, Rome, Italy, 6-10 March 1961
(Meeting Report No. AN 1961/3)

Fifth session, Rome, Italy, 2-6 April 1962
(Meeting Report No. AN 1962/3)

Sixth session, Rome, Italy, 17-21 June 1963
(Meeting Report No. AN 1963/5)

Seventh session, Rome, Italy, 4-8 May 1964
(Meeting Report No. AN 1964/4)

Eighth session, Rome, Italy, 24-29 May 1965
(Meeting Report No. AN 1965/3)

Ninth session, Rome, Italy, 20-25 June 1966
(SP-10/105 - 9th)

Tenth session, Rome, Italy, 25-31 August 1967
(SP-10/105 - 10th)

Eleventh session, Rome, Italy, 10-15 June 1968
(Cx 5/70 - 11th)

Twelfth session, Rome, Italy, 7-12 July 1969
(Cx 5/70 - 12th)

Thirteenth session, Rome, Italy, 15-20 June 1970
(Cx 5/70 - 13th)

Fourteenth session, Rome, Italy, 6-11 September 1971
(Cx 5/70 - 14th)

Fifteenth session, Rome, Italy, 25-30 September 1972
(Cx 5/70 - 15th)

Sixteenth session, Rome, Italy, 10-15 September 1973
(Cx 5/70 - 16th)

Seventeenth session, Rome, Italy, 14-19 April 1975
(Cx 5/70 - 17th)

Eighteenth session, Rome, Italy, 13-18 September 1976
(Cx 5/70 - 18th)

Nineteenth session, Rome, Italy, 12-17 June 1978
(Cx 5/70 - 19th)

CODE OF PRINCIPLES CONCERNING MILK AND MILK PRODUCTS:

First Edition	1960
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