codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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ALINORM 81/13

CODEX ALIMENTARIUS COMMISSION
Fourteenth Session 1981

REPORT OF THE SEVENTEENTH SESSION OF
THE CODEX COMMITTEE ON FOOD HYGIENE
Washington, D.C., 17-21 November 1980

INTRODUCTION

1. The Seventeenth Session of the Codex Committee on Food Hygiene was held in the Main Conference Room, Department of State, Washington, D.C., from 17-21 November by courtesy of the Government of the United States. The session was attended by representatives and observers from 31 countries and six international organizations (see Appendix I for list of participants).

2. The session was opened by Dr. Alan Forbes, Associate Director, Nutrition & Food Sciences, Bureau of Foods, US Food and Drug Administration, who welcomed the participants on behalf of the Government of the USA. In the field of nutrition, he foresaw that Codex Committees in general would be progressively more concerned with problems of nutrient toxicity and environmental contamination and with questions of food technology such as food fortification, oil hydrogenation, protein extraction, and special dietary foods. He also thought that information from the behavioural sciences such as the results of dietary changes, responses to warnings on health hazards and information/education programmes would have applications in the activities of the Codex Committees. He underlined the link between food hygiene and nutrition in relation to food-borne gastro-intestinal diseases and malnutrition in developing countries, especially among infants and pre-school children. He also pointed out that there was increasing interest in other inter-related fields such as the role of gastro-intestinal flora on bio-availability of nutrients in the diet and on certain chronic diseases, food handling/food distribution and the effect of fortification on the microbiological quality of foods. The present agenda covered some items which were of common interest to food hygiene and nutrition.

INFORMATION ON ACTIVITIES WITHIN FAO AND WHO OF INTEREST TO THE COMMITTEE

3. The representative of WHO reviewed the activities of his organization relating to the work of the Committee.

4. The Thirty-first World Health Assembly (1978) had discussed the principles and orientation of WHO's food safety programme and requested the Director-General to emphasize particularly the following:

"Coordination and collaboration with FAO and the Codex Alimentarius Commission with a view to increasing the output of the Commission as regards standards on food safety, codes of practice that are relevant to developing countries, and the acceptance of Codex Standards".

5. Taking into consideration the reorientation of the work of the Commission to the needs of developing countries, the Veterinary Public Health Unit, together with FAO, was strengthening activity on Meat Hygiene and Meat Handling under Austere Rural Conditions. The main objective of this work was an improvement of slaughter and meat hygiene under circumstances where modern facilities were lacking. For successful elaboration and further implementation of this programme, which would be part of Primary Health Care, it was planned to visit one or two African countries to select suitable areas (villages) for the trial.

6. The main components of the development programme were: training, guidelines for the design and construction of slaughter facilities, and slaughter and meat handling and meat inspection.

7. A series of other practical guidelines were under preparation by the Veterinary Public Health Unit of WHO. Some would have a great practical value for developing countries, for example, "Guidelines on Echinococcosis/Hydatidosis surveillance, prevention and control" and "The prevention of human health hazards caused by animals in urban areas".

8. The essential technical help to health programmes in developing countries with respect to zoonoses and foodborne diseases would be provided by WHO Zoonoses Centres. At present adequate services for such technical cooperation were available in the Region of the Americas through the Pan American Zoonoses Centre. On 1 February 1979 the UNDP/WHO Mediterranean Zoonoses Control Programme, with the participation of FAO, began operations, the principal centre being located in Athens.

9. The need for more effective control over the occurrence of pathogenic micro-organisms and their toxins in food was evident. Such control must be exercised not only at the processing level but also during distribution, wholesale and retail storage and ultimate usage either in food service establishments or the home. Food safety through the Hazard Analysis and Critical Control Point System (HACCP) was an approach to these problems.

10. This concept was originally developed for use in food processing establishments in the USA and had the full support of WHO. The first meeting of experts in this field was convened in Geneva 9-11 June 1980 and they discussed the further development of the HACCP system, which included: assessment of the health and spoilage risks associated with processing and marketing a given food product; determination of Critical Control Points in the manufacturing process, and the establishment of programmes for monitoring Critical Control Points. Work on the development of the above-mentioned concepts would continue.

11. A series of meetings had been held by WHO in Geneva and in the Regional Office for Europe, and the FAO/WHO Collaborating Centre for Research and Training in Food Hygiene, Berlin (West), concerning the WHO Surveillance Programme for Control of Foodborne Infections and Intoxications. The last meeting, which was convened after the First World Congress of Foodborne Infections and Intoxications, 4-6 July 1980, Berlin (West), reviewed the amended version of the paper "Organization and Management of the WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe" which contained the main objectives of the Programme and detailed information about its organization and management. This document enabled the Programme to be operational in 1980 as was originally recommended.

12. WHO, together with FAO, ICMSF, ISO, IDF and other international bodies active in this field, was working on microbiological specifications for foods. This work was of great interest to all Codex Commodity Committees.

13. The Veterinary Public Health Unit of WHO paid special attention to salmonellosis as an internationally-distributed foodborne disease. The subject was discussed at the Round Table Conference on the present status of the Salmonella problem (prevention and control) in Bilthoven, The Netherlands, 6-10 October 1980. This Conference was organized

by WHO and the World Association of Veterinary Food Hygienists. Scientists from 12 countries, experts in Salmonella problems, participated and prepared interesting scientific papers. The outcome of the Conference was very fruitful and in the near future it is planned to develop a WHO interglobal programme for the prevention of Salmonella infections in animals and man.

14. The Organization's coordination activities in post graduate training in food microbiology and zoonoses continued with a food microbiology course held in the Netherlands.

15. At the beginning of November 1980 all the staff members of The Headquarters Veterinary Public Health Division were invited to the USSR to give lectures devoted to zoonoses and foodborne diseases. These lectures were presented at the UNEP/FAO/WHO training courses in Moscow for the representatives of developing countries.

16. The Joint FAO/IAEA/WHO Expert Committee on the Wholesomeness of Irradiated Food met from 27 October - 3 November 1980 in Geneva. The agenda of this meeting contained such questions as: general aspects relating to the assessment of the wholesomeness of irradiated food (chemical changes, toxicological and microbiological aspects), assessment of the wholesomeness of irradiated food and feed, irradiation technology, etc.

17. The representative of WHO also referred to discussions which took place at the meeting of the Executive Committee held in Geneva 13-17 October 1980, regarding the General Principles for the Establishment and Application of Microbiological Criteria for Foods. The representative of the region of Africa had stressed that the main causes of biological contamination were basically bad or inadequate sanitation at the environmental level and the personal level and that food hygiene practices throughout the food chain as well as in the home were priority areas.

18. It was proposed that the WHO representative in consultation with this Committee should be requested to draw up a written statement on the situation and the orientation that he envisaged should be given to future activities in this area.

19. The Executive Committee agreed that the discussions should be brought to the attention of this Committee following which a paper could if necessary be placed before the next session of the Executive Committee.

20. The representative of the FAO Fisheries Department informed the Committee of relevant activities of the Fish Utilization and Marketing Service. He informed the Committee that FAO, with support from Denmark, had begun a series of Training Courses on Fish Technology and Quality Control. The first course was held in July 1980 in Lima for the Spanish speaking countries of South America. The same course for English speaking countries of South America will be held in 1981 in Guyana. Three other courses were scheduled for Africa and Asia in the 1981/84 period.

21. The FAO Expert Consultation on Fish Technology in Africa was held in Dar-es-Salaam in February 1980. Several topics connected with food hygiene were discussed. Much attention was given to the problem of using pesticides to reduce insect infestation and post harvest losses. Although the application of pesticides reduced insect infestation, the problem was that fisheries in many countries in Africa were often encouraged by traders to use cheaper products of unknown composition and origin and thus created grave risks for potential consumers of dried or salted fish. The Consultation had unanimously agreed that application of insecticides should be a last resort and should be used only where careful dosing and efficient control were assured.

22. Concerning visual aids, FAO had prepared the last of a series of three film strips on the general principles of hygiene in the fish industry. One film strip entitled "The Dirty War" dealt with the problem of hygiene in processing plants and was now available in English: a Spanish version would soon be available. Other film strips prepared previously, "A Question of Quality" and "Quality Control in Fish Plants" were available in English, French and Spanish.

23. The FAO Fisheries Department had begun the publication of a new "FAO Species Catalogue". The first volume "Shrimps and Prawns of the World" was now available and was a part of a series that would consist of eleven volumes covering all marine and related organisms of interest to fishermen.

ACTIVITIES OF ISO

24. Dr. I. Erdman (Canada) informed the Committee of recent progress in the work of Sub-committee 9 (SC9) of the ISO Technical Committee 34 (TC 34) which had met in Berlin 18-20 March 1980.

Enumeration of Staphylococcus Aureus

Work on the method had begun in 1979: a revised version was prepared and submitted to the ISO Secretariat for circulation as a DIS (Draft International Standard).

Detection of Staphylococcus (P/A test)

The proposal for the P/A test using Giolitti-Cantoni's medium was withdrawn pending the development of a better medium.

Enumeration of E. coli

A Baird-Parker membrane filtration method was discussed but it was considered that there was as yet insufficient experience of this method with foods other than meat. It was decided not to issue a DIS at present but to inform ICMSF of the interest in the method and the need for further work. The method was also referred to ISO SC6 (Meat Products).

Presumptive Count of E. coli by MPN

This document was revised and issued for comments. It was decided that if no substantive comments were received by the stipulated deadline the document would be distributed for voting as an ISO International Standard.

Work was also in progress on general techniques in microbiology and on the preparation of dilutions.

REVIEW OF MATTERS RELEVANT TO THE COMMITTEE AS DISCUSSED BY THE CODEX ALIMENTARIUS COMMISSION AND VARIOUS CODEX COMMITTEES

A. Codex Alimentarius Commission, 13th Session 3-14 December 1979

25. The following Codes of Hygienic Practice were advanced to Step 8:

- Revised General Principles of Food Hygiene
- Foods for Infants and Children (except for microbiological criteria)
- Peanuts (Groundnuts)
- Low-acid and acidified Low-acid Canned Foods
- Revised General Principles of Food Hygiene, Annex I Cleaning and Disinfection.

26. The Commission also advanced the proposed Draft Code of Hygienic Practice for Dried Milk to Step 6.

27. The Commission noted that a Joint FAO/WHO Working Group had recommended a text which proposed microbiological criteria relating to mandatory and advisory provisions in Codex Standards and Codes of Practice; the text had been modified by the Committee at its 16th Session but a consolidated text had not been circulated for consideration by Governments. It was decided to suspend further action until the text had been re-examined by the Committee in the light of Government comments.

B. Executive Committee, Geneva 13-17 October 1980

NATURE OF CODES OF PRACTICE

28. In response to a query from the Codex Committee on Food Hygiene at its 16th Session held in July 1979,concerning the nature of Codex Codes of Practice, the Executive Committee reaffirmed that codes of practice were, as indicated in the General Principles of the Codex Alimentarius, advisory. The Introduction in the publications containing codes of practice made it clear that the codes were issued to governments as recommendations and not as standards for acceptance. The Executive Committee also reaffirmed that parts of a code (usually end-product specifications) or even an entire code if the Commodity Committee concerned thought it necessary, could become mandatory by being included or referred to in a mandatory way in a Codex Standard. It was also established practice to use the word "shall" to indicate that a requirement was mandatory and to use the word "should" to indicate that it was a recommendation only, but not mandatory.

OTHER COMMITTEES

C. Codex Committee on Fish and Fishery Products

29. The above Committee had agreed that the provisions of the Hygiene section in their standards would have a more logical sequence if the obligatory sub-section came before the references to the relevant codes of hygienic practice, and rearranged the section accordingly in the Revised Recommended International Standard for Canned Salmon. The proposed text now read:

4. HYGIENE

4.1 To the extent possible in good manufacturing practice the product shall be free from objectionable matter.

4.2 When tested by appropriate methods of sampling and examination, the product:

(a) shall be free from micro-organisms capable of development under normal conditions of storage; and

(b) shall not contain any substances originating from micro-organisms in amounts which may represent a hazard to health.

4.3 Products with an equilibrium pH above 4.6 shall have received a processing treatment sufficient to destroy all spores of Clostridium botulinum.

4.4 In order to achieve the above requirements, it is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the following Codes:

(i) the appropriate sections of the Revised Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 1).

(ii) the Recommended International Code of Practice for Canned Fish (CAC/RCP 10-1976);

(iii) the Code of Hygienic Practice for Low-acid and acidified Low-acid Canned Foods

Draft Codes of Practice for Minced Fish, for Frozen Battered and/or Breaded Fishery Products and for Crabs

30. These codes were considerably amended by the Committee on Fish and Fishery Products which agreed that the revised texts should be examined by this Committee at this session. If this Committee had no substantive changes to make, the Codex Committee on Fish and Fishery Products wished to submit the Codes of Practice for Minced Fish and for Crabs to the Commission at Step 5 of the Procedure (see also paras 49-58).

Microbiological Specifications for Shrimps and Prawns

31. An ad hoc Working Group which met during the session did not come to any conclusions on whether or not numerical criteria should be applied to imported shrimps and prawns, but agreed that the Microbiological Criteria developed by the 3rd FAO/WHO Expert Working Group should be used in an advisory manner in conjunction with the Code of Practice for Shrimps and Prawns so that producing countries could control production.

32. Although a CL (1979/34) had been issued in September 1979 asking for information on in-plant microbiological and sampling methods which complied with the hygiene provisions of the Codex Code of Practice, no replies had been received so that comparable data were not available to the Working Group. The Secretariat was therefore asked to re-issue the request.

33. The Working Group fully supported the "General Principles for the Establishment of Microbiological Criteria for Foods" as amended by the Committee but did not think that the raw fish products mentioned in 6.1(4) (fresh fish, frozen fish, shrimps and prawns, lobster and froglegs) in the report of the last session had high priority for the application of such criteria. They considered instead that Chapter 11 of the Report of the 2nd FAO/WHO Expert Consultation was a more appropriate listing of commodities, that is:

Chilled and frozen raw poultry
Chilled and frozen raw meat
Cooked meat and poultry
Pre-cooked frozen crab
Pre-cooked frozen lobster and related items
Desiccated coconut
Cheese
Fishery products (fresh and frozen raw fish; frozen, battered and breaded fish products)
Dried Soups and Broths
Dried Fruits
Tree Nuts
Enzymes, gelatine, lactose, protein concentrates (e.g. casein, caseinate, fish protein, soybean protein, whey powder), yeast
Low acid salad dressing.

Specifically pre-cooked frozen crab and pre-cooked frozen lobster and related items required examination and the Committee agreed that as for frozen shrimp and prawns data on frozen cooked crab-meat should be collected and analyzed to see whether microbiological criteria should be included in the Code of Practice for Crabs.

Food Grade Fish Concentrate

34. The delegation of Thailand had reported at the 13th Session of the Commission (ALINORM 79/38, para 367) that products corresponding to FPC type B as defined by the PAG, Protein Advisory Group (later Protein-Calorie Group of the United Nations and now discontinued), had been tested in Thailand in cooperation with the USA:

(i) as a main ingredient in food preparations;
(ii) as a protein supplement;
(iii) as raw material for the production of fish sauce.

35. The results of the tests had been favourable and the delegation believed that FPC type B had wide potential use in Thailand and neighbouring countries and further studies were in progress. The Codex Committee on Fish and Fishery Products was asked to consider elaborating a Code of Practice.

36. The representative of the IAFMM (International Association of Fish Meal Manufacturers) informed the Committee that the Norwegian Government had established regulations to control hygiene requirements and GMP based on PAG Guidelines (No. 9) since 1972.

37. Other countries were now interested in protection against uncontrolled FPC products and as a result FAO had agreed that the IAFMM scientific group should prepare a background document covering the hygiene and nutritional aspects of FPC products for a future joint FAO/IAFMM meeting.

38. Further consideration on the need for a Codex Code of Practice was therefore deferred until the next session of the Codex Committee on Fish and Fishery Products.

D. Codex Committee on Processed Meat and Poultry Products - 11th Session, 22-26 September 1980

Sampling and Inspection Procedures for Microbiological Examination of Meat Products in Hermetically Sealed Containers

39. At its 11th Session the Committee examined the above document which had been advanced to Step 6 by the Commission. The document, which was intended to become another annex (Annex C of the Recommended Code of Hygienic Practice for Processed Meat Products), was considered too detailed.

40. It was considerably amended during the session and was recommended for advancement to Step 8 of the Procedure and would be submitted to this Committee for examination.

Proposed Draft Code of Hygienic Practice for Dry and Semi-dry Sausages

41. Although previously the Codex Committee on Processed Meat and Poultry Products had, in agreement with the Commission, proposed to begin work on the above Code, further discussion during the session showed that there was restricted trade in the type of product which was of concern. The Committee decided to suspend further action until the countries not present at the session had an opportunity to comment on whether they needed such a Code.

Revision of the Recommended Code of Hygienic Practice for Processed Meat Products

42. Although the Code had been issued in 1976, most of the provisions were derived from work done in the mid 1960's. A major revision both with regard to technical content and layout was proposed. In addition, examination of HACCP (hazard analysis critical control points) could be made. It was agreed that a working group should be formed to revise the Code.

43. The representative of WHO agreed to enquire whether such a Group could meet at WHO in Geneva if costs were borne by governments and sponsoring agencies.

ENDORSEMENT OF HYGIENE PROVISIONS IN CODEX STANDARDS AT STEP 8

Codex Committee on Processed Fruits and Vegetables

44. The Committee was informed that endorsement of the hygiene provision was required in the following Draft Standards:

Canned Apricots (Appendix V to ALINORM 81/20)
Dried Apricots (Appendix III to ALINORM 81/20)
Unshelled Pistachio Nuts (Appendix IV to ALINORM 81/20)
Dates (Appendix IX to ALINORM 81/20).

The Committee endorsed these provisions.

Joint ECE/Codex Alimentarius Group of Experts on Standardization of Fruit Juices

45. The Committee noted that the hygiene provisions contained in the Draft Standard for Nectars of Certain Citrus Fruits preserved exclusively by physical means (Appendix I to ALINORM 81/14) were identical to those already endorsed in other Codex Standards for fruit nectars. The Committee endorsed the provisions in the above Standard.

Codex Committee on Fats and Oils

46. The Committee noted that the hygiene provisions contained in the Draft Procedure for Minarine at Step 8 (Appendix III to ALINORM 81/17) were the same as those for margarine and agreed to endorse the hygiene provisions in the Draft Standard for Minarine.

Joint ECE/Codex Alimentarius Group of Experts on Quick Frozen Foods

47. The Committee was informed that this Group of Experts had advanced the following Draft Standards to Step 8 of the Procedure:

Quick Frozen Corn on the Cob (Appendix IV to ALINORM 81/25)
Quick Frozen Whole Kernel Corn (Appendix V to ALINORM 81/25)
Quick Frozen Carrots (Appendix VI to ALINORM 81/25)

In view of the fact that the hygiene provisions contained in the above Standard were similar to those in other Codex Standards for quick frozen foods, the Committee agreed to endorse the hygiene provisions in the three Step 8 Standards.

48. The Secretariat pointed out that the reference to the General Principles of Food Hygiene which was a general provision in all Standards should be amended to refer to the revised version of the general principles which had been adopted at the 13th Session of the Commission. The Committee agreed that the Secretariat should be instructed to make the appropriate amendments to the hygiene provisions in the above draft standards at Step 8 of the Procedure.

DRAFT CODES OF PRACTICE FOR MINCED FISH, FOR FROZEN BATTERED AND/OR BREADED FISHERY PRODUCTS AND/OR CRABS

49. The Committee formed an ad hoc Working Group to review the above codes which had been amended by the Codex Committee on Fish and Fishery Products (see also para 31) at its last session.

50. As requested by the Committee an ad hoc Working Group comprising members of the delegations of Australia, Canada, Federal Republic of Germany, India, New Zealand, Norway, Pakistan, United Kingdom (rapporteur) and the United States of America under the chairmanship of the representative from FAO, reviewed the list of substantive changes made to the draft codes of practice for minced fish, frozen battered and/or breaded fishery products, and crabs, by the 14th Session of the Codex Committee on Fish and Fishery Products in the light of government comments and further comments made by those present at the meeting.

51. The Working Group agreed and fully supported the opinions expressed by the Codex Committee on Fish and Fishery Products that there was an urgent need to harmonize these codes. Care should be taken in the harmonization process to ensure that the most recent recommendations framed including those in the revised General Principles of Food Hygiene were adopted in the final document.

Draft Code of Practice for Minced Fish at Step 3

52. The Working Group concurred with the changes proposed by the 14th Session of the Codex Committee on Fish and Fishery Products (CX/FFP 79/4, Rev. 2) except for a few of a non-substantive nature.

53. The Working Group noted that the 14th Session of the Codex Committee on Fish and Fishery Products had not commented on the question referred to it by the Committee at its last session relating to the killing of parasites by freezing fish at -20°C. The Committee recommended that the matter be referred back to the Committee for Fish and Fishery Products for comments.

54. The delegation of the Netherlands drew to the attention of the Committee that the Code of Practice for Minced Fish in its present version did not cover headed and gutted fish and edible offals as raw material for minced fish. Such raw material was commercially used in many countries and therefore it was proposed that the Committee on Fish and Fishery Products consider this at its next session.

55. The Committee agreed with the recommendation that the code be sent to the Codex Alimentarius Commission for adoption at Step 5.

Draft Code of Practice for Frozen Battered and/or Breaded Fishery Products

56. The Working Group generally accepted with a few amendments of a non-substantive nature the changes proposed by the 14th Session of the Codex Committee on Fish and Fishery Products (CX/FFP 79/8, Rev. 1).

57. The Working Group thought that although Section 4.5, Quality Control Programme, required very careful study it should be discussed by this Committee before receiving Government comments requested by the Codex Committee on Fish and Fishery Products.

Draft Code of Practice for Crabs

58. The Working Group concurred with the substantive changes proposed by the 14th Session of the Codex Committee on Fish and Fishery Products (CX/FFP 79/3, Rev. 1). The Committee agreed with the recommendation that the Draft Code of Practice for Crabs be sent to the Codex Alimentarius Commission for adoption at Step 5.

GENERAL PRINCIPLES FOR THE ESTABLISHMENT AND APPLICATION OF MICROBIOLOGICAL CRITERIA FOR FOODS

59. The Committee appointed an ad hoc Working Group to examine the General Principles which had been amended by an FAO/WHO Working Group which met in Geneva 20-26 February 1979 (see WG/Microbiol/79/1) and which subsequently had been amended by the Committee at its 16th Session (see ALINORM 79/13A, paras 30-40). The complete text was now available to the Committee in CL 1979/40.

60. The Working Group was composed of the following countries: Australia (Chairman), Brazil, Canada, Denmark, Egypt, Federal Republic of Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, UK (rapporteur) and the USA.

61. During discussions by the Working Group and by the Committee the following points were made:

General

62. The delegation of Egypt thought that the use of the term "microbiology" might be taken to exclude toxins and proposed that "micro-organisms and toxins" should be specifically included in the text. The Committee noted that this was covered in Section 4 which mentioned microbial contamination. The Committee decided that this was sufficiently broad and it was not necessary to refer specifically to toxins.

Paragraph 1.1

The delegate of the USA suggested that "parasites of concern" should be specified. After considerable debate it was decided that the present paragraph should not be changed.

Paragraph 1.5

The use of the word "proportion" was agreed to be incorrect and was replaced by "number".

Section 2

On a proposal of the delegation of the United Kingdom it was agreed to include in this section a cross reference to Section 5 to make it clear that these categories of microbiological criteria were involved.

Paragraph 2.1.1

One change was made, that is, the correction of "food" to "food concerned" in the fourth line.

The delegation of Egypt pointed out that organisms presently regarded as non-pathogenic may, as a result of further information, be found to be pathogens and therefore proposed that the paragraph be modified to take account of this. The ad hoc Working Party agreed with the views expressed but believed that it was unnecessary to include this.

Paragraph 2.2.1

A number of delegations were concerned that the present paragraph was unclear. The official agency involved would depend on which country was applying the end product specifications - and at what point they were being controlled. Some delegations expressed the view that the specifications should only be applied to food at the point of entry to a country. Others thought that the specification could be used both by industry and official agencies. In order to accommodate both these views it was decided to delete "serves as a guide to the official agency having jurisdiction and".

Paragraph 2.2.2

The second sentence of this paragraph was modified from " ... and is not to be used for official control purposes" to "is not intended for official control purposes" because the Codex Alimentarius Commission had no controlling authority over governments. The ad hoc Working Party, however, felt it was necessary to emphasize that microbiological guidelines were in principle designed to guide the manufacturer. The delegations of Norway and Sweden reserved their positions on this point.

Paragraph 4 (page 3)

The delegation of Australia proposed that the sentence in the second paragraph dealing with the extent of testing, etc., was imprecise and therefore it was reworded.

Paragraph 5

The delegation of Australia suggested clarification of the 4th line where it referred in the original text to "it is optional whether any action be taken". After considerable debate involving a number of countries it was agreed to accept the suggestion of the delegation of Switzerland to combine the proposals of the delegations of Australia and Canada and to change the last sentence of sub-section 5.1 to read "It is optional whether any further action is taken".

Paragraph 6.2

2nd sentence. This was revised because it was felt by a number of delegates that the present requirement to use only methods of proven reliability might not always be possible. For standards it was considered by the Working Party to be necessary to use only methods of proven reliability but that for specifications, although these methods should be used where possible, it might be necessary under some circumstances to employ less validated methods.

The last sentence of the third paragraph was modified by adding the wording "or exceed their shelf-life" as this was also of importance.

Paragraph 6.3

The delegation of Egypt suggested that numerical limits should take account of the virulence of the organism of concern. The Committee after some discussion decided that the status of current knowledge was such that this could not be taken into account as it depended on many factors as well as the intrinsic virulence of the organism. The Committee also noted that where the method for Salmonella spp. or S. typhi was concerned a safety margin was built into the sampling method so as to cover the most serious possible case in the light of present information. The inclusion of serotyping in the method would be unnecessarily expensive and in some cases restrictive to a general application of the method.

Paragraph 6.4

The delegation of Australia was of the opinion that sampling plans should include the confidence limits for rejection or acceptance of the product. The Committee, while agreeing that this was desirable and that ultimately it may be necessary to incorporate such data, thought that it was not practicable to do so at the present time because of lack of detailed knowledge. The Committee noted that no guidance on these sampling plans was given and agreed to make appropriate reference to the latest edition of the ICMSF publication on the subject. It was agreed that wherever possible confidence limits should be included in sampling plans.

Paragraph 9

The last word of the sentence was deleted and replaced by "adoption by the Codex Alimentarius Commission" because the use of the word "acceptance" has a defined meaning in Codex documents which is not appropriate here.

The amended text with an introductory section is attached as Appendix II.

STATUS OF THE GENERAL PRINCIPLES FOR THE ESTABLISHMENT AND APPLICATION OF MICROBIOLOGICAL CRITERIA FOR FOODS

63. The Committee agreed that work on this subject was now completed and decided that it should be submitted to the Commission for adoption.

64. It was noted that originally the text was intended for inclusion in a future edition of the Procedural Manual of the Commission. Several delegations were of the opinion that because the need for the document was urgent and, because its contents contained technical as well as procedural guidance, it should be prepared and distributed as soon as possible as a separate publication. At a later date the text could be either referenced or included verbatim in the Procedural Manual.

65. The Committee agreed to this course of action and decided to request the Commission to approve its publication as soon as possible.

CONSIDERATION OF THE CODE OF HYGIENIC PRACTICE FOR THE COLLECTING, PROCESSING AND MARKETING OF NATURAL MINERAL WATERS

66. The Committee had before it working document CX/FH 80/2 containing the first draft of the above code, prepared by Switzerland. It was noted that the FAO/WHO Working Group on Microbiological Criteria for Foods, which had met prior to the session of the Committee, had considered for inclusion into the code microbiological specifications and related methodology based on working documents CX/FH 79/4 and CX/FH 79/4 Add. 1. The report of the Working Group had been distributed as a conference room document.

67. The delegation of Switzerland introduced working paper CX/FH 80/2 and pointed out that the major provisions of the code relating to microbiological criteria were contained in Section 2 (Definition), Section 6 (Personnel Hygiene and Health Requirements) and Section 7 (Establishment: Hygienic Processing Requirements).

68. It was noted that a temporary contamination at the source could result in extensive contamination of mineral water which then represented a danger to the health of consumers. Therefore, it was considered to be of importance to provide guidance by means of a code in order to safeguard the consumer and to enhance the microbiological quality of the product. Major points of concern were the control of the source including the catchment area, the transport systems, processing areas, technical facilities, proper training of personnel and certain methods such as addition of carbon dioxide.

69. The Committee discussed generally the need for this code. It was also agreed to consider the inclusion of microbiological end-product specifications and related methodology into the code taking into account the deliberations of the Working Group.

General Considerations

70. The delegation of the United Kingdom noted that according to para 4.4, page 14 of the report of the Working Group, no information had been available to the Working Group which related the outbreak of foodborne diseases to the consumption of natural mineral waters. Furthermore the Committee fully discussed whether any subsidiary Committee of the Codex Alimentarius Commission was in a position to consider all aspects of this code as drafted, including those which did not directly relate to hygiene matters but required expertise in e.g. water geology.

71. The Committee noted that, based on the advice given at its previous session, on the principles related to the establishment of microbiological criteria for foods which required an accompanying code of practice, (a) the Regional Coordinating Committee for Europe had requested an appropriate code to be developed (para 44 of ALINORM 79/19), (b) this Committee had agreed with that proposal and subsequently requested the delegation of Switzerland to elaborate such a draft code (para 116 of ALINORM 79/13A), and (c) these developments had been reported to the Thirteenth Session of the Commission which had fully supported the development of a Code of Hygienic Practice for the Collecting, Processing and Marketing of Natural Mineral Waters (para 301 of ALINORM 79/38).

72. Attention was drawn to the fact that the Codex Standard for Natural Mineral Waters as adopted by the Codex Alimentarius Commission was a European regional standard which represented mainly the interests of countries of the European region. It was therefore proposed that the code might also be developed by that Committee and limited to the needs in the European region. It was recognized, however, that such a procedure might limit the participation of countries other than European countries.

73. Several delegations not belonging to the European region, including Thailand, Gabon and Egypt, pointed out that exploitation of, and trade in, natural mineral waters was increasing in their countries and that guidance and expertise was needed at an international level to assure a proper quality of these products. It was noted that in certain countries, for example France, extensive legislation existed relating to requirements for the collection and bottling of natural mineral waters. Several delegations expressed the view that provisions of importance to international trade in bottled mineral waters were already laid down in the Codex Standard for Natural Mineral Waters (CAC/RS 108-1979) and that advice on additional matters related to hygiene could easily be obtained from the General Principles of Food Hygiene. Other delegations thought that there was also a need to provide all governments with an advisory text on hygiene matters specifically related to the extraction, processing and bottling of these products.

74. It was proposed that the Committee on Natural Mineral Waters which had been adjourned sine die several years ago might be able to develop the code. In view of the fact that that Committee had also been a European Regional Committee only and having regard to the financial implications of reviving an adjourned Codex Committee, it was decided that the Committee on Food Hygiene was the appropriate body to elaborate a world-wide Code of Hygienic Practice for Natural Mineral Waters. It was agreed to examine the draft code as contained in CX/FH 80/2 section by section.

75. Attention was drawn to the fact that the draft code had been prepared by using procedures included in the Revised General Principles of Food Hygiene either in full or appropriately adapted. The Committee agreed to give special considerations to those adapted procedures and to provisions which were specific to the subject ofnatural mineral water.

Section II - Definitions

76. With regard to Section 2.1.1, the view was expressed that, since the Regional European Standard for Natural Mineral Waters to whichthe definition referred had not yet been presented, it was not appropriate to insert the definition to that reference only. However, it was pointed out that the Standard had already been adopted by the Commission and that it would be published as CAC/RS 108-1979 and issued to governments for acceptance.

Section III - Prescription on the Resources of Natural Mineral Water

77. The Committee fully discussed the meaning of "catchment" and "catchment area" in Sections 3.5 and 3.7 respectively. It was pointed out that the provisions in Section 3.5, as drafted, would not even make allowance for rainfall in the catchment area.

78. It was noted that different views existed as to the meaning of the catchment area (Section 3.7). One delegation pointed out that the catchment area consisted of the area immediately surrounding the spring, but it was recognized that the catchment area could comprise a very large area and the term "catchment area" in the latter sense was well defined in water geology. To avoid different interpretations it was proposed to limit this term to cover a radius of about 60 m. It was finally agreed to replace "catchment" in Section 3.5 by "extraction" and in Section 3.7 the wording should be "protection of the extraction area". Consequent changes were made throughout the text. In addition, wherever "must" appeared in the text it was agreed to change it to "should".

Exploitation of Natural Mineral Water

79. The Committee noted opinions that Section 3.8 should include provisions for preventing the multiplication of the original microbiological flora of natural mineral water at the source and in the end product but decided to make no change in the text since in general the original microbiological flora did not develop during exploitation.

Means of Transport and Reservoirs

80. There was some discussion as to the exact sense of the word "transport" in Section 3.12 and of the exact meaning of "vehicle". It was explained that the terms were intended to cover conveying of the natural mineral water in the plant whether by mechanical means or by simple piping. It was agreed that the heading of 3.1.2 should be changed to "transport, piping and reservoirs". It was also agreed to add stainless steel and ceramic as examples of inert material.

Roadways and Areas used by Wheeled Traffic

81. The Committee agreed that particular care should be taken to ensure that drainage should be to a point well separated from the point of extraction and added "provision should be made for protection of the extraction area in accordance with 3.7, where appropriate".

Disposition of Facilities

82. The Committee agreed to replace the provision under 4.3.5 with the text from Section 4.3.5 of the General Principles of Food Hygiene (G.P.).

Canalization, Wastelines - Fuel Depots

83. The Committee agreed to replace "waste" by "drainage" and "depot" by "storage area" and to change the title accordingly.

Water Supply

84. There was some discussion as to whether natural mineral water properly belonged in Section 4.4.1.2 since, in the opinion of some delegations, the provisions were intended to apply to hygienic facilities and not to the product itself.

85. It was agreed to add at 4.3.7 "Natural mineral water handling, storage and bottling areas" a new provision - "piping" to read "piping for natural mineral water lines should be independent of potable and non-potable waters".

86. Under Section 4.4.1.2 it was agreed to add the following provision from the G.P. "Steam used in direct contact with food and food contact surfaces should contain no substances which may be hazardous to health or may contaminate the food". The delegation of Egypt recommended the use of potable water for the production of steam and refrigeration as a safeguard against back-syphonage and cross-contamination. The Committee considered the proposal uneconomic in practice and decided to make no change.

Hygienic Design, Construction and Installation

87. It was agreed to replace the text of 4.5.2.1 with the corresponding text from the G.P.

V. ESTABLISHMENT: HYGIENE REQUIREMENTS

Cleaning and Disinfection

88. In Section 5.2.3 reference to potable water was changed to read "water in compliance with 7.3 of the Recommended Code of Hygienic Practice - General Principles of Food Hygiene".

VI. ESTABLISHMENT: HYGIENIC PROCESSING REQUIREMENTS

Raw Material Requirements

89. The Committee agreed to change "controlled continuously" to "monitored regularly".

90. Some delegations were of the opinion that the provisions under this Section were not strictly hygiene provisions and suggested that the Section be deleted. Others thought that the provisions had hygienic significance because changes in the criteria could be caused by conditions related to hygiene. After some further discussion, the delegation of Switzerland agreed to provide an explanation of the hygienic significance of the criteria for consideration at the next session of the Committee.

91. The Committee then discussed the criteria and made the following changes:

7.1.1 The requirement for control of the air temperature was deleted.
7.2.2 "Aspect" was changed to "Appearance".

Other Raw Materials

92. The Committee agreed to delete this section.

Storage - Engineering Equipment

93. The Committee decided to delete the above sections and to re-write this section and the section on "treatment" by deleting the present provisions 7.6.2 - 7.6.4 and replacing them with Sections 7.4.1, 7.4.4 of the G.P. Section. Section 6.1 of the present Code was retained.

Containers

94. It was agreed to replace this provision with Section 7.5 "Packaging" from the G.P.

Bottling

95. This section was considered to be covered by the amendment to the previous section and was therefore deleted.

Storage - Transport of the End Product

96. It was agreed to delete the last sentence requiring that the product be despatched in the sequence of the lot numbers.

VII. END PRODUCT SPECIFICATIONS

97. The Committee noted that, following its discussion at its previous session, an FAO/WHO Working Group had met immediately before the present session to examine the question of the microbiological criteria which should be attached to the Code and had prepared a report for consideration at the present session (see also para 66).

98. The Chairman of the Working Group, Dr. J.H.B. Christian, reviewed the draft report. He informed the Committee that the Working Group had considered the definition of natural mineral water, the definition of a lot for such products, micro-organisms of concern and/or their toxins, and sampling plans and microbiological limits, and had proposed microbiological criteria for consideration by the Committee.

99. The Committee noted that the Working Group had considered a list of organisms to be included in End Product Specifications. These were coliforms, E. coli, Streptococcus spp (Lancefield Group D), spore-forming sulphite reducing anaerobic bacteria, Pseudomonas aeruginosa and mesophilic bacteria capable of multiplying in 10 x diluted plate count medium.

100. The Working Group had considered that a test for E. coli was superfluous when the appropriate coliform test was applied. It was also of the opinion that the 10-fold dilution plate count medium with incubation at 42°C (modified ISO 4833) could probably be used for the detection of P. aeruginosa and persistent indicator organisms when fully evaluated. It was noted that no accepted standard method for P. aeruginosa existed.

101. The report also gave guidelines to manufacturers based on "Criteria for Microbiological Analyses of Source" Draft European Regional Standard for Natural Mineral Waters.

102. After a brief discussion the Committee agreed that the relevant sections of the report of the Working Group should be attached to the Draft Code of Hygienic Practice for the Collecting, Processing and Marketing of Natural Mineral Waters and issued with a circular letter for Government comments.

Status of the Code

103. The Committee agreed to advance the Code to Step 3 of the Procedure (see Appendix III to this Report).

CONSIDERATION OF DRAFT CODE OF HYGIENIC PRACTICE FOR DRIED MILK AT STEP 7

104. The Committee had before it the above code as contained in Appendix V to ALINORM 79/13A and comments thereon from New Zealand (CX/FH 80/3). It was noted that an FAO/WHO Working Group on Microbiological Criteria for Foods had met prior to the session and that the Microbiological Criteria for Dried Milk Products as contained in Annex I to Appendix V of the above report would be discussed later after taking into account the report of the above Working Group on this matter.

General Comments

105. The Committee agreed that the code should be additionally amended and aligned with the revised text of the General Principles of Food Hygiene. The Committee further agreed to limit its discussions as far as possible to those sections of the code which were either specific to the Code on Dried Milk or those which had been taken from the General Principles of Food Hygiene and adapted to the specific requirements of this code. (Note: sidelined sections in Appendix V to ALINORM 79/13A).

Section I - Scope

106. The Committee found this Section satisfactory as drafted and did not make any amendments.

Section II - Definitions

107. The Committee was informed by the delegation of Brazil that in Brazil spray drying was the only permitted process for the preparation of dried milk for human consumption. It was noted that in other countries roller drying was permitted and the Committee did not amend the definition for "dried milk" (Section 2.5). No changes were made to the definitions under Establishment (Section 2.6) and "Liquid Milk Products" (Section 2.8).

108. Referring to its written comments, the delegation of New Zealand proposed to raise the pasteurization temperature to 75°C for products with a higher milk fat content than milk (Section 2.9(ii)). The observer from the International Dairy Federation (IDF) supported this proposal and stated that there had been an overall agreement, following an IDF study on the subject, that the temperature for pasteurization of milk products with a higher fat content, such as cream, or with additional sweeteners, should be 75°C.

109. The delegation of Australia pointed out that an amendment to the present text requiring 75°C in Section 2.9(ii) would make it also necessary to apply this temperature/time relationship to milk products which had only a slightly higher milk fat content than milk and proposed therefore the following wording of Section 2.9(ii):

> "Milk products which have a higher milk fat content than milk and/or containing added sweeteners may require a higher time/temperature combination depending upon the composition of the mixture."

It was further proposed to add an explanatory sentence as follows: "A typical time/temperature combination for e.g. cream (18% fat) is 75°C for 15 sec.". The delegation of the United Kingdom informed the Committee that in the UK cream had been pasteurized for many years at 71.7°C/15 sec. without any adverse effects. The Committee agreed to add the explanatory sentence as indicated above relating to cream (18% fat) which was felt to be an appropriate example.

110. The Committee discussed whether or not to require a higher temperature for pasteurization where Q-fever was a problem. The Committee agreed with the delegation of New Zealand that this document should not contain a reference to Q-fever.

111. Concerning the definition of "Protective clothing" in Section 2.11, the delegation of Pakistan was of the opinion that it should be stated explicitly that head coverings included beard coverings. He emphasized that this was very important to minimize contamination of the product. The Committee considered however that the reference to "head coverings" adequately covered this point. There was a full discussion as to whether this definition should include requirements prescribing a specific colour for the outer garments worn by persons in the establishment. It was pointed out that while the customary white uniforms did indeed not show soiling with unpasteurized material, dark colours made it difficult to detect other dirt. It was also pointed out that this definition related to the requirements of Personal Cleanliness in Section 6.6 which was identical to the relevant section of the General Principles. The delegation of Egypt proposed the use of sterile masks over nasal passages to reduce the danger of contamination of milk by Staphylococci. The Committee thought that such use would be unpractical and did not change the provision. The Committee concluded that, since the General Principles did not include a definition for protective clothing, such a provision was superfluous in this code. Section 2.11 was therefore deleted.

Section III - Hygiene Requirements in Production Area

112. The Committee changed the title to refer to Milk Production Area.

Section IV - Establishment: Design and Facilities

113. With regard to Section 4.3 - Buildings and Facilities, the Committee agreed with the wording of Section 4.3.7 - "Windows", as drafted. It was also agreed that these provisions in Section 4.3.11 related also to the design of the establishment and to building materials. Wood for construction purposes, where appropriate, should be permitted. Therefore no changes were made to Section 4.3.11.

114. The Committee did not make any change to Section 4.4.3 Refrigeration, and Section 4.4.4 Air.

115. The delegation of New Zealand proposed that Section 4.4.9 on lighting should permit the use of slightly yellow tinged light which was known to be more beneficial to workers in working areas with over-large stainless steel surfaces. It was noted that this provision required updating to align it with the revised General Principles of Food Hygiene which specified that "where appropriate, the lighting should not alter colours". The Committee agreed that this reference provided adequate flexibility to allow the use of such yellow lighting when appropriate.

116. In Section 4.5.2.3 it was agreed to replace "plant" by "equipment". The Committee noted the written comments from New Zealand that in pre-heating equipment no thermometer and automatic temperature recorders were required. The Committee agreed with this and amended 4.5.2.3 to separate the provision for pasteurizing and pre-heating equipment.

117. Several delegations expressed the view that the term "instruments" as used in Section 4.5.2.4 did not fully cover all temperature measuring devices and that in fact these measuring devices as such could be located elsewhere in the plant. It was agreed to replace "instruments" by "sensors of the temperature measuring devices".

118. There was an extensive discussion as to whether it was necessary to provide for special facilities for withdrawal of samples (Section 4.5.2.5 - Facilities). The delegation of Switzerland was of the opinion that proper in-plant control would be provided for in any factory and such a provision was therefore not needed. The delegation of New Zealand drew attention to difficulties in cleaning such sampling points and to the fact that adequate precautions were laid down in Section 7.7.2. The delegation of the United Kingdom felt that sampling points should be so designed as to protect the product and to avoid contamination. In line with the comment from the delegation of the Netherlands that it was advisable that such facilities be provided, the Committee agreed to add the words "where necessary" to Section 4.5.2.5.

119. Section 4.5.3.2 was amended to refer to "effective", rather than "efficient" operation.

120. Under Section 5.1 the Committee agreed to include a provision that spray dryers should be regularly inspected for cracks.

Section V - Establishment: Hygiene Requirements

121. In regard to Section 5.2.2 it was agreed that the last sentence be replaced by the following: "In general, in-place cleaning is recommended particularly for spray dryers".

122. The Committee discussed the requirements for cleaning and disinfection of the plant contained in Sections 5.2.2 and 5.2.5.

123. It was pointed out by the delegation of the United States that liquid disinfection of surfaces in contact with dry material immediately prior to the use of the equipment might not be appropriate and that in Section 5.2.5 reference should also be made to the use of dry heat where appropriate.

124. Several delegations felt that more clarification was needed on what was meant by "immediately before use" in Section 5.2.5. It was not clear whether this applied to the change in shifts or to batches or whether it was intended to apply also to equipment which was used intermittently. In this context it was also pointed out that some surfaces were not disinfected immediately before use and that in any case disinfection followed a cleaning step as prescribed in Section 5.2.2. The time interval could be an agreed term, e.g. "a day's production". The Committee agreed that Section 5.2.5 should contain separate provisions for wet and dry disinfection and revised the text as follows:

> "5.2.5 Cleaned equipment and utensils should normally be disinfected immediately before use, by chemical or physical agents, as appropriate to the equipment concerned. In the case of dry product equipment, disinfection immediately before use may not

always be necessary. Where chemical agents are used, the equipment should be drained and then rinsed with water in compliance with Section 7.3 of this Code (see also Section 7.4.11)."

125. The delegation of Japan noted that the wording in Sections 5.2.6 and 6.6 was different in spite of the fact that both provisions dealt with protective clothing of the personnel. It was pointed out that Section 6.6 applied generally to all personnel working in the plant whereas special precautions were needed for persons entering the chamber of the spray dryer to which Section 5.2.6 applied.

Section VII - Establishment: Hygienic Processing Requirements

126. The delegation of Brazil requested more information as to what kind of ingredients were used in these products as mentioned in Section 7.1.5. It was explained that these ingredients could be any substance covered by the Codex definition of ingredient" and included food additives.

127. It was agreed that there was a need to be more specific in Section 7.2.2. It was pointed out that the provision should relate to "any exposed pasteurized products". The delegation of the Federal Republic of Germany proposed, and the Committee agreed, to take over basically the text in the General Principles, appropriately adapted to the requirements of this code. (See revised code in Appendix IV to this Report.)

128. In considering Section 7.4.3, the delegation of New Zealand expressed the view that it would be adequate to require cooling of the milk or milk products, that could not be processed quickly, to 7 °C rather than 4 °C as specified in the code. The delegation of New Zealand indicated that in New Zealand milk at farm level was water-cooled to about 16 °C, then refrigerated to 7 °C prior to collection and that this procedure was satisfactory. The delegations of the United States and Canada considered that a temperature of 7 °C would be satisfactory for small storage tanks; however, a lower temperature of 4 °C was required for large tanks. A proposal was made to delete direct reference to 4 °C and to require the products to be held at a temperature that would minimize spoilage. This was considered to be too vague and the Committee agreed on the following wording of the first sentence of 7.4.3:

"7.4.3 After inspection and testing, incoming milk and milk products should be processed directly or, if this is not possible, cooled to and held until processing at a temperature sufficiently low to prevent significant microbial growth."

129. It was agreed that Section 7.4.5 was covered by Section 7.4.6 and to delete 7.4.5.

130. Attention was drawn to the ethical and practical problems which could arise from reprocessing of products not meeting the microbiological requirements or containing objectionable matter. It was pointed out that Section 7.4.9 contained some provisions related to this matter. The delegation of New Zealand felt that this was not sufficient and proposed to include a new provision (7.4.12) which would give advice on means of reprocessing, including blending and reconstitution. The delegation of the Netherlands was of the opinion that the rejected products should be treated like other raw materials. However, it was pointed out that this would involve considerable ethical problems and it was suggested that the problem of reprocessing of products rejected for reasons indicated above should be treated at a more general level, possibly by the Commission itself. The Committee agreed to this and also replaced the last sentence of Section 7.4.9 by the following: "Further processing and testing may be required".

131. The Committee agreed with a proposal to add a new paragraph to read as follows: "7.4.11 Dried milk products should not be allowed to contact damp surfaces and equipment".

132. In context with the discussion of Section 7.5.5 the Committee noted that the FAO/WHO Working Group had proposed a new definition of "lot" which was considered to be more appropriate for dried milk products. The delegation of Australia questioned the

need for and acceptability of the revised definition which, if literally interpreted, could require markings allowing for the identification of the source(s) of raw materials, conditions of manufacture and day of final packing. The Committee agreed to include both definitions of "lot" in the draft code and to place them in square brackets in order to obtain government views on these matters.

133. With regard to Section 7.7, Sampling and Laboratory Control Procedures, it was questioned whether reference should be made to sampling, since this section did not contain any specific sampling procedures. The Committee agreed that sampling was an integral part of the procedures and agreed therefore to include Section 7.7.2 of the General Principles of Food Hygiene. It was also agreed to include a new group "(X) Steam Quality" under Section 7.7.2.

134. The Committee agreed that under Section 7.7.3 it should be noted that in many cases Codex methods were available. It was also agreed to replace "Salmonella" by "pathogenic micro-organisms" in Section 7.7.4. The Committee agreed that the reference to "microbiological" in Sections 7.7.5 and 7.7.6 be deleted to require records of all examinations to be kept.

Section VIII - End Product Specifications

135. After an extensive discussion the Committee agreed that reference should be restricted to provisions of a hygienic nature, and therefore deleted Section 8.1 C and D relating to chemical pollutants, pesticide residues and food additives. It was also finally agreed that Sections 8.1 A and B be amended to reflect the intent of the comparable provisions included in the Code of Practice for Peanuts.

CONSIDERATION OF DRAFT MICROBIOLOGICAL CRITERIA FOR DRIED MILK PRODUCTS

136. As indicated in para 59, it had been agreed that the above draft microbiological criteria as contained in Annex I to Appendix V of ALINORM 79/13A should be examined by an FAO/WHO Working Group on Microbiological Criteria for Foods taking into account the General Principles for The Establishment and Application of Microbiological Criteria for Foods.

137. The FAO/WHO Working Group which had met from 10-14 November 1980 in Washington, had been chaired by Dr. J.H.B. Christian, Australia. Dr. Christian presented the Report of the Working Group to the Committee and gave a brief outline of the most important items which had been discussed by that Group (Section 3 of CX/FH 80/7).

138. He pointed out that, in principle, the Working Group had been in agreement with the specifications contained in Annex I of Appendix V to ALINORM 79/13A. The Committee agreed that the way to proceed was to append the relevant sections of the report of the Working Group to this report to give governments an opportunity to examine the document and submit their comments on the draft microbiological criteria for dried milk products, having regard to the recommendations and observations made by the Working Group.

Status of the Code

139. The Committee agreed to retain the Draft Code of Hygienic Practice for Dried Milk and the Draft Microbiological Specifications for Dried Milk Products at Step 6 of the Procedure and to request governments to comment on both documents.

140. The revised text of the above code is contained in Appendix IV to this Report. The Draft Microbiological Specifications for Dried Milk Products are contained in Annex I to Appendix IV and the relevant sections of the Report of the FAO/WHO Working Group are contained in Appendix V to this Report. (See also paras 103 and 135-137).

STATEMENT OF THE INTERNATIONAL DAIRY FEDERATION IN RELATION TO APPLICATION OF MICROBIOLOGICAL CRITERIA TO MILK PRODUCTS OTHER THAN DRIED MILK

141. "The International Dairy Federation welcomes the now adopted General Principles for the Establishment of Microbiological Criteria for Foods and appreciates in particular that a definite distinction between mandatory and advisory criteria is made. The end product specifications for dried milk, developed on the basis of these Principles, will, after later adoption, be of considerable help in the international trade. However, there is also an urgent need for such internationally accepted microbiological criteria for other milk products for which an international trade exists. None of the Codex Standards accepted for these products contains microbiological standards and also no Codes of Hygienic Practice are expected to be developed soon, which would make available end product specifications in the near future. Consequently, authorities which have to decide on the acceptability or rejection of an imported product cannot profit by a criterion recognized by the Codex.

142. "In due consideration of this situation, the IDF will take advantage of the experience available amongst its member countries and develop end product specifications for a number of dairy products. These specifications could guide manufacturers and authorities to decide on the acceptability of dairy products as long as no microbiological criteria approved by the Codex are available. In this way, IDF expects to contribute to the objective of the Codex Committee on Food Hygiene, to the extent that experience will be gained in the application of such specifications as prerequisites for the eventual later development of microbiological standards.

143. "IDF intends to develop end product specifications for sweetened condensed milk, evaporated milk, cheese, processed cheese, butter and edible ices based on milk. The IDF will inform the Codex Committee on Food Hygiene as well as the "Milk Committee" on the results of these developments accordingly."

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR THE PROCESSING OF FROGLEGS

144. The Committee had before it revision of Sections 7.4 and 7.5 of the above code which had been prepared by the delegation of the Netherlands, as agreed at the 16th Session of the Committee in the light of Government comments. The Committee noted the observation of the delegation of the United Kingdom that the comments it had submitted were of an editorial nature and that no substantive changes to the text were proposed by other delegations.

145. It was agreed that the new sections with editorial amendments incorporated could replace the existing Sections 7.4 and 7.5 of the code.

Status of the Code

146. The Committee decided to advance the Draft Code of Hygienic Practice for the Processing of Froglegs to Step 5 of the Procedure.

CONSIDERATION OF MICROBIOLOGICAL CRITERIA IN THE CODE OF HYGIENIC PRACTICE FOR FOODS FOR INFANTS AND CHILDREN AT STEP 7

147. The Committee had before it the Microbiological Specifications for Foods for Infants and Children (up to three years) and Methods for Microbiological Analysis for Foods for Infants and Children (up to three years) as contained in Appendix V to ALINORM 79/13 at Step 7.

148. The Committee recalled that the Code of Hygienic Practice for Foods for Infants and Children, including the two above documents, had been submitted to the 13th Session of the Commission for adoption at Step 8.

149. The Commission, while adopting the code itself, had decided however to return the microbiological specifications to Step 6 of the Procedure. The reason for this was that several delegations had made reference to the 11th Session of the Codex Committee on Foods for Special Dietary Uses which had examined the question as to whether microbiological criteria for foods for infants and children should be mandatory or advisory in view of the special nature of these products. The 11th Session of the Committee on Foods for Special Dietary Uses had not been able to decide on this and had requested governments to give further consideration to this matter.

150. In view of the foregoing, the Commission had also decided to return the methods for microbiological analysis to Step 6 since the types of method to be used were dependent on whether the microbiological criteria were mandatory or advisory.

151. Governments had been requested to submit their comments on the limits in the specifications having regard to the principles set out in the General Principles for the Establishment and Application of Microbiological Criteria for Foods. The limits were not further discussed by the Committee. Comments had been submitted by Switzerland, Sweden and New Zealand but the latter were not available during the discussion.

152. The Committee was informed that the Committee on Foods for Special Dietary Uses at its 12th Session had given further consideration to the nature (mandatory or advisory) of the microbiological criteria, having also regard to the general principles which defined as advisory microbiological specifications such as those contained in the Code of Hygienic Practice for Foods for Infants and Children. The Committee for Foods for Special Dietary Uses had agreed that the microbiological specifications for foods for infants and children should be advisory. At the same time however that Committee was informed by several delegations that in their countries microbiological criteria were mandatory for foods for infants and children. The Committee on Foods for Special Dietary Uses concluded that further developments in national legislation might require reconsideration at a later date whether there was a need for mandatory microbiological criteria in Codex Standards for Foods for Infants and Children.

153. The Committee noted that Sweden had submitted a written comment supporting the view that microbiological criteria should be of an advisory nature.

154. Several delegations strongly urged the Committee to confirm that the microbiological specifications for foods for infants and children, as contained in Appendix V to ALINORM 79/13, be of an advisory nature. It was pointed out that this Committee had developed these specifications with the intention that the requirements were advisory only. There would be no justification for applying the values of M in mandatory requirements since this could well result in the destruction of acceptable foods which had been produced under conditions of good manufacturing practice.

155. Many delegations expressed the view that the specifications had been very carefully reviewed and amended by the 2nd FAO/WHO Joint Expert Consultation and had now been examined by governments for some years. A number of delegations advised the Committee that the specifications had been used as advisory texts in their countries and had been found to be satisfactory.

156. It was pointed out by the delegation of Switzerland that even though, according to their definition in the General Principles, microbiological and product specifications are said to be of an advisory nature, these General Principles also state nevertheless that if specifications are not met, not only corrective measures should be taken but "further action may be taken". When specifications contain very low limits, this could lead to condemning food that is hygienically of a sufficient quality. It was for this reason that the delegation of Switzerland had proposed less restrictive and more realistic values for m and M for coliforms and mesophilic aerobic bacteria in product categories (a), (b) and (c). The delegation of Canada indicated that more care was necessary to select M values properly. Too often these had been based on the upper limit of attainability under Good Manufacturing Practices instead of on the ICMSF

proposal that they determine "unfitness" based on spoilage or health hazard. Such action may unjustifiably result in condemnation of foodstuffs.

157. The delegation of Egypt stated that other pathogenic micro-organisms such as Mycobacterium tuberculosis or Brucella spp should be included in the microbiological criteria because of their prevalence in developing countries. He suggested that the type or types of salmonella which prove to be relatively heat resistant should be treated by pasteurization processes. He suggested that coliforms should not include faecal coliforms.

158. The delegation of Norway was of the opinion that criteria for Bacillus cereus should be developed.

159. The Committee decided the following:

(a) the microbiological specifications as contained in Appendix V to ALINORM 79/13 were strictly of an advisory nature;

(b) the Secretariat was instructed to include a preface to this effect and to emphasize that the microbiological criteria should by no means be used as microbiological criteria of a mandatory nature;

(c) not to change the actual values contained in the two documents and to submit to the Commission for adoption at Step 8 the following:

- microbiological specifications for Foods for Infants and Children (including the preface), and the
- methods for microbiological analysis for Foods for Infants and Children (see Appendix VII to this Report).

160. The delegations of Brazil, New Zealand, Switzerland, Thailand and the United Kingdom were of the opinion that the proposals should be further discussed after the Government comments had been received and reserved their positions.

OTHER BUSINESS

MEETING OF THE WORKING GROUP ON LOW-ACID AND ACIDIFIED LOW-ACID CANNED FOODS

161. The Committee noted the report of the above ad hoc Working Group consisting of representatives from Canada, Netherlands, United Kingdom, and the United States which had met, as charged, to consider a code for pasteurized food in hermetically sealed containers, which required refrigerated storage. They recognized that quite a variety of products could be involved which no single code would adequately cover. A similar decision was made concerning a recent proposal to prepare a single code for all dried foods.

162. It was further recognized that problems occasioned by canned foods requiring refrigeration had arisen not because of production problems but because storage temperature requirements were not adhered to.

163. The main products of this category of foods which moved internationally seem to be primarily canned pasteurized ham and corned beef, with an undetermined volume of certain marinated fish products also possibly involved.

164. The Working Group felt that the temperature requirements should appear in the commodity codes. The meat products code was presently being prepared, and at least some of the fish products were already in codes. The Fish Committee should be asked to ensure that all appropriate commodities were covered.

165. The ad hoc Working Group was prepared to develop a specific product code if there were a real need and no commodity committee was prepared to handle it.

166. It was also noted that the Codex Committee on Food Labelling, which held its 15th Session the previous week in Canada, was considering a labelling provision which would require such refrigerated storage temperatures to appear on the label.

167. The Working Group recognized that canned foods might be subject to various types of mishandling and damage after leaving the canning plant and such product was usually salvaged. For that reason, the members of the sub-committee felt that a new code should be developed to ensure the safety of salvaged products.

168. The scope of the proposed code should include criteria for judging salvagability as well as procedures for salvaging canned foods.

169. After a brief discussion the Committee agreed that a code of hygienic practice for the salvaging of damaged canned products was an important area for future work and accepted the offer of the delegation of Canada to prepare a first draft for consideration at its next session at Step 2 of the Procedure.

Precooked Meals

170. The delegation of Belgium drew the Committee's attention to the increasingly widespread production of precooked meals both for trade through the cold chain and for direct distribution through catering services, to various group or communal feeding systems. Catering services had already encountered hygiene problems in this area and it was proposed that the Committee should consider the elaboration of a Code of Hygienic Practice for the Preparation of Precooked Meals.

171. The Committee noted that several delegations thought that the elaboration of such a code was necessary. The delegation of Belgium agreed to prepare a background document on the subject for discussion at the next session of the Committee.

UNITED NATIONS/ECONOMIC COUNCIL FOR EUROPE (UN/ECE) GROUP OF EXPERTS ON STANDARDIZATION OF EGG PRODUCTS

172. The Committee was informed that at its 4th Session the Group of Experts had considered the elaboration of a Code of Practice for Egg Products not prepared in Egg Processing Establishments on the basis of a document prepared by the rapporteur of the United Kingdom. After some discussion it had been agreed that a harmonized approach to Codes of Practice would be best achieved by requesting the Codex Committee on Food Hygiene to continue with the elaboration of the text with the objective of attaching it as an annex to the Codex Code of Hygienic Practice for Egg Products. The basic document had therefore been issued by the UN/ECE Group of Experts to Codex Contact Points for comments.

173. Only one comment - from the Government of Poland - had so far been received. Poland did not agree with the proposal to elaborate such an annex, but thought that the Code of Hygienic Practice for Egg Products itself was in need of revision.

174. The Committee agreed that there was a case for the elaboration of an annex dealing with the treatment of melange and decided that a circular letter should be issued asking for government opinions. In addition, views on whether revision of the Code itself was necessary should be sought and the matter examined in more detail at the next session of the Committee.

RECYCLING OF MUNICIPAL WASTES

175. The Committee noted the observation of the delegation of the USA that municipal wastes were being recycled on an increasing scale for use as fertilizers and proposed that a Code of Hygienic Practice governing the use of such products could be envisaged.

176. The Committee decided not to pursue the matter at the present time since the uses of such products were mainly agricultural and only indirectly of hygienic importance.

DISTRIBUTION OF CODEX AND OTHER PUBLICATIONS

177. The Committee noted the observations of some delegations that in some countries there was great difficulty in obtaining Codex booklets on Standards and Codes of Hygienic Practice. This was either because the official booksellers listed on the publications did not have them in stock or, in some cases, because the booksellers were no longer in business. This, it was thought, was one of the reasons for a lack of knowledge in many countries of the activities and publications of the Codex Alimentarius Commission. These delegations were of the opinion that every effort should be made to assure a more widespread distribution of Codex publications and a better understanding of the aims of the Codex Alimentarius. They thought that one possible way in which there could be better communication between, for example, governments of developing countries and Codex Commodity Committees, was to bring specific problems from such Committees to the attention of Regional Coordinating Committees.

178. Delegations also expressed concern that an FAO Food and Nutrition Paper entitled "Manual of Food Quality Control No. 4 - Microbiological Analysis" had been issued which contained microbiological limits for certain foods. In view of the Committee's work on end product specifications they thought that issuing such limits (which were cited from ICMSF publications) in FAO documents could lead to some misunderstanding in developing countries on the authority of such documentation and that such documents should be brought to the attention of this Committee.

179. The Committee agreed to bring these matters to the attention of the Codex Alimentarius Commission.

FUTURE WORK

180. The Committee noted that its future programme of work would include the following items:

- Code of Hygienic Practice for the Collection, Processing and Bottling of Mineral Waters
- Code of Hygienic Practice for Dried Milk
- Possible Consideration of a Code of Hygienic Practice for Melange and revision of the Recommended Code of Hygienic Practice for Egg Products
- Code of Hygienic Practice for the Processing of Froglegs
- Code of Hygienic Practice for the Salvaging of Canned Foods
- Background document on the preparation of precooked meals and associated hygiene problems.

DATE AND PLACE OF NEXT SESSION

181. The Committee noted that the next session of the Committee should take place in about one year's time. The exact date and place of the meeting would be fixed by agreement between the Codex Secretariat and the United States Government.

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GENERAL PRINCIPLES FOR THE ESTABLISHMENT AND APPLICATION OF MICROBIOLOGICAL CRITERIA FOR FOODS

These General Principles are intended to guide, primarily, Codex Committees in the establishment and application of microbiological criteria and to this end they contain definitions of mandatory and advisory criteria which relate specifically to the requirements of the Codex Alimentarius. They are also intended for application where microbiological criteria for foods are being developed.

1. DEFINITION OF MICROBIOLOGICAL CRITERIA FOR FOODS

A microbiological criterion, as defined for Codex purposes, consists of:

1.1 a statement of the microorganisms and parasites of concern and/or their toxins. For this purpose, microorganisms include bacteria, viruses, yeasts and moulds;

1.2 the analytical methods for their detection and quantification;

1.3 a plan defining the number of field samples to be taken, the size of the sample unit and where and, if appropriate, when the samples are to be taken;

1.4 microbiological limits considered appropriate to the food; and

1.5 the number of sample units that should conform to these limits.

2. APPLICATION OF MICROBIOLOGICAL CRITERIA

Microbiological criteria, as defined for Codex purposes, fall into two main categories: (See also Section 5 for interpretation)

2.1 Mandatory criterion

2.1.1 A microbiological standard is a criterion contained in a Codex Alimentarius Standard. Wherever possible it should contain limits only for pathogenic microorganisms of public health significance in the food concerned. Limits for non-pathogenic microorganisms may be necessary and when these are included the provisions of paragraph 6.1 shall apply. A microbiological standard shall not be introduced de novo but shall be derived from microbiological end-product specifications which have accompanied Codes of Practice through the Codex Procedure and which have been extensively applied to the food.

2.2 Advisory criterion

An advisory criterion is one of two types contained in Codes of Practice.

2.2.1 A microbiological end-product specification is intended to increase assurance that the provisions of hygienic significance in the Code have been met. It may include microorganisms which are not of direct public health significance.

2.2.2 A microbiological guideline is applied at the establishment at a specified point during or after processing to monitor hygiene. It is intended to guide the manufacturer and is not intended for official control purposes. It may include microorganisms other than those regarded in 2.1.1 and 2.2.1.

3. PURPOSE OF MICROBIOLOGICAL CRITERIA FOR FOODS

3.1 The purpose of microbiological criteria for foods is to protect the health of the consumer by providing safe, sound and wholesome products and to meet the requirements of fair practices in trade.

4. GENERAL CONSIDERATIONS CONCERNING PRINCIPLES FOR ESTABLISHING AND APPLYING CRITERIA

4.1 The basis of control of microbiologically sensitive foods should be through the application of Codes of Practice. A microbiological criterion should be established and applied only where there is a definite need for it and where it can be shown to be effective and practical. Such need is demonstrated by epidemiological evidence that the particular food is a public health hazard, or where an assurance is required that the provisions of hygienic significance in the Code have been adhered to. The criterion should be technically **attainable** by good manufacturing practice so that it does not encourage the use of objectionable treatments in an attempt to reduce microorganisms to the acceptable level.

4.2 To fulfil the purposes of microbiological criteria, consideration should be given to

- the evidence of hazards to health;
- the microbiology of the raw material;
- the effect of processing on the microbiology of the food;
- the likelihood and consequences of microbial contamination and/or growth during subsequent handling and storage;
- the category of consumers at risk; and
- the cost/benefit ratio associated with the application of the criterion.

4.3 The number of samples tested shall be as stated in the sampling plan and shall not be exceeded.

4.4 To make the best use of limited resources of money and manpower, it is essential that only appropriate tests be applied to those foods and at those points during the processing and distribution of food that offer maximum benefit in providing the consumer with a safe, sound and wholesome food.

4.5 The need for inspection of the establishment including the production process should be considered.

5. INTERPRETATION OF RESULTS

5.1 When a product fails to meet a criterion the action to be taken depends on the type of criterion and on the circumstances. If the limit exceeded is part of a standard the product concerned must be rejected as unfit for its intended use; if it is part of an end-product specification appropriate action should be taken to rectify the causative factor. It is optional whether any further action is taken. When a limit in a guide-line is exceeded this should not necessarily result in rejection of the product but should in general lead to the identification and correction of causative factors.

5.2 When the product is rejected there are in principle several options as to the action to be taken, depending on the findings and the circumstances. Such options include sorting, reprocessing (e.g. by heating), and destruction, and may need to be specified in the criterion. In deciding on the option the major consideration should be to keep to a minimum the risk that unacceptable food reaches the consumer. However, food must not be needlessly destroyed nor declared unfit for human consumption.

6. COMPONENTS OF A MICROBIOLOGICAL CRITERION

6.1 Microorganisms of importance in a particular food

6.1.1 The microorganisms included in a criterion should be widely accepted as relevant - as pathogens, as indicator organisms or as spoilage organisms - to the particular food and technology. Organisms whose significance in food is in doubt should not be included in a criterion.

6.1.2 The mere finding, with a presence-absence test, of certain organisms which have caused foodborne illness (e.g. Staphylococcus aureus, Clostridium perfringens and Vibrio parahaemolyticus) does not necessarily indicate a hazard.

6.1.3 When choosing a test for an indicator organism there should be a clear understanding as to whether the test for this organism is used to indicate an unsatisfactory manufacturing practice or whether it is used to indicate the possible presence of a pathogen. Where pathogens can be detected directly, a test for these should be used instead of tests for indicator organisms.

6.2 Microbiological methods

6.2.1 For use in a standard or end-product specification, methods elaborated by international organizations for a food or a group of foods should be preferred. For standards, and wherever possible for end-product specifications, only methods for which the reliability (accuracy, reproducibility, inter- and intra-laboratory variation) has been statistically established in comparative or collaborative studies in several laboratories should be used. While reference methods to be used in standards and end-product specifications should be the most sensitive and reproducible for the purpose, methods to be used in guidelines might often sacrifice to some degree sensitivity and reproducibility in the interests of speed and simplicity. They should, however, have been proved to give a sufficiently reliable estimate of the information needed.

6.2.2 When choosing a microbiological method as a reference method, consideration should be given to the universal availability of media, equipment, etc.

6.2.3 Methods which are applicable uniformly to various groups of commodities should be given preference over methods which apply only to individual commodities. Methods for testing rapidly perishable foods should be so designed that the results of microbiological examinations can be available before the foods are consumed or exceed their shelf-life.

6.3 Microbiological limits

6.3.1 Limits should be based on microbiological data appropriate to the food and to the kind of criterion in question. Limits for standards and end-product specifications should be based on data gathered at various stages of production, storage and distribution, while limits for guidelines could be based on data obtained from microbiological monitoring during production. The numerical limits should take into consideration the risk associated with the organisms likely to affect the acceptability of the food, and the conditions under which the food is expected to be handled and consumed. Numerical limits should also take account of the distribution of micro-organisms in the food and the inherent variability of the analytical procedure.

6.3.2 If a criterion requires a particular microorganism not to be detected, the size of sample shall be indicated. It should be borne in mind that no feasible sampling plan can ensure complete absence of a particular organism.

6.3.3 Microbiological limits can be related only to the time and place of sampling and not to the presumed number of microorganisms at an earlier or a later stage. As good manufacturing practice aims at producing foods with microbiological characteristics significantly better than those required by public health considerations, a numerical limit in a guideline may be more stringent than in a standard or an end-product specification.

6.4 Sampling plans

6.4.1 A sampling plan is the particular choice of sampling procedure and the decision criteria to be applied to a lot, based on examination of a prescribed number of sample units by defined methods. Sampling plans should be administratively and economically feasible. In particular, sampling plans should take into account the heterogeneity of distribution of microorganisms. For standards and end-product specifications, 2- or 3-class attribute plans may find useful applications. (See **ICMSF Microorganisms in Food 2. Sampling for Microbiological Analysis. Principles and Specific Applications 2nd Edition 1978.**)

6.4.2 Wherever possible, the confidence limits of the sampling plans should be given.

7. SAMPLING METHODS AND HANDLING OF SAMPLES

7.1 The sampling method shall be defined in the sampling plan. The time between field sampling and analysis should be as short as possible and during transport to the laboratory the conditions (e.g. temperature) should be appropriate to the food, so that the results reflect - within the limitations given by the sampling plan - the microbiological conditions of the lot presented for inspection.

8. REPORTING

8.1 The test report shall give the information needed for complete identification of the sample, the results, and the test method.

9. PROVISIONS FOR RECONSIDERATION AT REGULAR INTERVALS

9.1 Criteria should be reviewed and if necessary revised at three year intervals after their adoption by the Codex Alimentarius Commission.

ALINORM 81/13
APPENDIX III

DRAFT CODE OF HYGIENIC PRACTICE FOR THE COLLECTING, PROCESSING AND MARKETING OF NATURAL MINERAL WATER

(at Step 3)

SECTION I - FIELD OF APPLICATION

This code recommends appropriate general techniques for collecting natural mineral water, its treatment, bottling, packaging, storage, transport, distribution and sale for direct consumption, so as to guarantee a safe, healthy and wholesome product.

SECTION II - DEFINITIONS

2.1 For the purposes of this code the following expressions have the meaning stated:

2.1.1 Natural mineral waters - all waters meeting the requirements of the European Standard for Natural Mineral Waters (CAC/RS 108-1979).

2.1.2 Adequate - sufficient to accomplish the intended purpose of this code.

2.1.3 Cleaning - the removal of soil, food residues, dirt, grease or other objectionable matter.

2.1.4 Contamination - the occurrence of any objectionable matter in the product.

2.1.5 Disinfection - the reduction, without adversely affecting the natural mineral water, by means of hygienically satisfactory chemical agents and/or physical methods, of the number of micro-organisms to a level that will not lead to harmful contamination of natural mineral water.

2.1.6 Establishment - any building(s) or area(s) in which natural mineral water is handled after collection and the surroundings under the control of the same management.

2.1.7 Handling of natural mineral water - any manipulation with regard to collecting, treating, bottling, packaging, storing, the transport, distribution and sale of natural mineral water.

2.1.8 Food Hygiene - all measures necessary to ensure the safety, soundness and wholesomeness of natural mineral water at all stages from its growth, production or manufacture until its final consumption.

2.1.9 Packaging Material - any containers such as cans, bottles, cartons, boxes, cases, or wrapping and covering material such as foil, film, metal, paper, and wax-paper.

2.1.10 Pests - any animals capable of directly or indirectly contaminating natural mineral water.

2.1.11 Containers - any bottle, carton, can or other container to be filled with natural mineral water, properly labelled and intended for sale.

2.1.12 Aquifers - any solid permeable mass of rocks (layer) containing natural mineral water.

2.1.13 Spring - any natural mineral water discharging genuinely from the ground.

SECTION III - PRESCRIPTIONS ON THE RESOURCES OF NATURAL MINERAL WATERS

A. Protection of alimentary reservoirs and aquifers

3.1 Authorization

Any spring, well or drilling intended for the collection of natural mineral water should be approved by the official authority having jurisdiction for this region.

3.2 Determination of the genesis of natural mineral water

As far as it is methodologically possible in each case, a precise analysis should be carried out on the origin of natural mineral waters, the period of their residence in the ground before being collected and their chemical and physical qualities.

3.3 Perimeter of protection

Areas wherein natural mineral water might be polluted or its chemical and physical qualities otherwise deteriorated should be determined by a hydrologist. Where indicated by hydrogeological conditions and considering the risks of pollution and physical, chemical and biochemical reactions, several perimeters with separate dimensions may be provided for.

3.4 Protective measures

Sufficient precautionary measures should be taken within the protected perimeters to avoid any pollution or deterioration of the chemical and physical qualities of natural mineral water. It is necessary that regulations be established for the disposal of liquid, solid or gaseous waste, the use of substances that might deteriorate natural mineral water (by agriculture e.g.) as well as for any possibility of accidental deterioration of natural mineral water by natural occurrences such as a change in the hydrogeological conditions. Particular consideration should be given to the following potential pollutants: bacteria, viruses, fertilizers, hydrocarbons, detergents, pesticides, phenolic compounds, toxic metals, radioactive substances and other soluble organic or inorganic substances. Even where nature provides apparently sufficient protection against surface pollution, potential hazards should be taken into consideration, such as mining, hydraulic and engineering facilities etc.

B. Hygiene prescriptions for the collection of natural mineral water

3.5 Extraction

The withdrawal of natural mineral water (from springs, galleries, genuine or drilled walls) must be performed in conformity with the hydrogeological conditions in such a manner as to prevent any other than the natural mineral water from entering, or, should there be pumping facilities, prevent any extraneous water from entering by reducing the supply. The natural mineral water thus collected or pumped should be protected in such a way that it will be safe from pollution whether caused by natural occurrence or actions of neglect or ill will.

3.6 Materials

The pipes, pumps or other possible devices coming into contact with natural mineral water and used for its collection should be made of such material as to guarantee that the original qualities of natural mineral water will not be changed.

3.7 Protection of the extraction area

In the immediate surroundings of springs and wells, precautionary measures should be taken to guarantee that no pollutant whatsoever can enter the extraction area, that is, an area surrounding the source within a radius of about 60 m. The extraction areas to be established therefore should at least be identical with the areas allocated at the time of construction. These extraction areas should be inaccessible to non-authorized people by providing adequate devices (e.g. enclosure). Any use not aiming at the collection of natural mineral water should be forbidden in these areas.

3.8 The exploitation of natural mineral water

The condition of the extraction facilities, areas of extraction and perimeters of protection as well as the quality of the natural mineral water should periodically be checked. Should the extraction facilities not guarantee a clear separation of natural mineral water from other waters and should such a separation only be obtainable from

pumping stations by limiting the withdrawal, the latter should be adapted to the yielding capacity of natural mineral water. To control the stability of the chemical and physical particulars of the natural mineral water derived - besides the natural variations - automatic measurements of the typical characteristics of water should be carried out and notified (e.g.electrical conductance,temperature, content of carbon dioxide) or frequent partial analyses should be done.

C. Maintenance of extraction facilities

3.9 Technical aspects

Methods and procedures for maintaining the extraction facilities should be hygienic and not be a potential health hazard to humans or a source of contamination to natural mineral water. From the hygiene standpoint, servicing of the extraction installations should meet the same standards as those required for the bottling or treatment.

3.10 Equipment and reservoirs

Equipment and reservoirs used for extraction of natural mineral water should be constructed and maintained in order to minimize all hazards to human health and to avoid contamination.

3.11 Storage at the point of extraction

The quantity of natural mineral water stored at the point of extraction should be as low as possible. The storing should furthermore guarantee protection against contamination or deterioration.

D. Transport of natural mineral water

3.12 Means of transport, piping and reservoirs

Any vehicle, piping or reservoir used in the processing of natural mineral water from its source to the bottling facilities, the latter included, should comply with the necessary requirements and be made of inert material such as ceramic and stainless steel which prevents any deterioration, be it by water, handling, servicing or disinfection; it should allow easy cleaning.

3.13 Maintenance of vehicles and reservoirs

Any vehicle or reservoir should be properly cleaned and if necessary disinfected and kept in good repair so as not to present any danger of contamination to natural mineral water and of deterioration of the essential qualities of natural mineral water.

SECTION IV - ESTABLISHMENT FOR /TREATMENT/ AND BOTTLING OF NATURAL MINERAL WATER - DESIGN AND FACILITIES

4.1 Location

Establishments should be located in areas which are free from objectionable odours, smoke, dust or other contaminants and are not subject to flooding.

4.2 Roadways and areas used by wheeled traffic

Such roadways and areas serving the establishment which are within its boundaries or in its immediate vicinity should have a hard paved surface suitable for wheeled traffic. There should be adequate drainage and provision should be made for protection of the extraction area in accordance with sub-section 3.7 where appropriate and to allow for cleaning. Adequate road signals should be provided to call the attention of road users to the existence of a natural mineral water extraction area.

4.3 Buildings and Facilities

4.3.1 Type of construction

Buildings and facilities should be of sound construction and maintained in good repair.

4.3.2 Disposition of holding facilities

Rooms for recreation, for storing or packaging of raw material and areas for the cleaning of containers to be re-used should be apart from the bottling areas to prevent the end product from being contaminated. Raw and packaging materials and any other additions which come into contact with natural mineral water should be stored apart from other material.

4.3.3 Adequate working space should be provided to allow for satisfactory performance of all operations.

4.3.4 The design should be such as to permit easy and adequate cleaning and to facilitate proper supervision of food hygiene.

4.3.5 The buildings and facilities should be designed to provide separation by partition, location or other effective means between those operations which may cause cross-contamination.

4.3.6 Buildings and facilities should be designed to facilitate hygienic operations by means of a regulated flow in the process from the arrival of the natural mineral water at the premises to the finished product, and should provide for appropriate temperature conditions for the process and the product.

4.3.7 Natural mineral water handling, storing and bottling areas

- Floors, where appropriate, should be of water-proof, non-absorbent, washable, non-slip and non-toxic materials, without crevices, and should be easy to clean and disinfect. Where appropriate, floors should slope sufficiently for liquids to drain to trapped outlets.
- Walls, where appropriate, should be of water-proof, non-absorbent, washable and non-toxic materials and should be light coloured. Up to a height appropriate for the operation they should be smooth and without crevices, and should be easy to clean and disinfect. Where appropriate, angles between walls, between walls and floors, and between walls and ceilings should be sealed and coved to facilitate cleaning.
- Ceilings should be so designed, constructed and finished as to prevent the accumulation of dirt and minimize condensation, mould development and flaking, and should be easy to clean.
- Windows and other openings should be so constructed as to avoid accumulation of dirt and those which open should be fitted with screens. Screens should be easily movable for cleaning and kept in good repair. Internal window sills, if present, should be sloped to prevent use as shelves.
- Doors should have smooth, non-absorbent surfaces and, where appropriate, be self-closing and close fitting.
- Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes, should be so situated and constructed as not to cause contamination to food. Chutes should be constructed with inspection and cleaning hatches.
- Piping for natural mineral water lines should be independent of potable and non-potable waters.

4.3.8 In natural mineral water handling areas all overhead structures and fittings should be installed in such a manner as to avoid contamination directly or indirectly of natural mineral water and raw materials by condensation and drip, and should not hamper cleaning operations. They should be insulated where appropriate and be so designed and finished as to prevent the accumulation of dirt and to minimize condensation, mould development and flaking. They should be easy to clean.

4.3.9 Living quarters, toilets and areas where animals are kept should be completely separated from and should not open directly on to natural mineral water handling areas.

4.3.10 Where appropriate, establishments should be so designed that access can be controlled.

4.3.11 The use of material which cannot be adequately cleaned and disinfected, such as wood, should be avoided unless its use would clearly not be a source of contamination.

4.3.12 Canalisation, drainage lines

Canalisation and drainage and used water lines as well as any possible waste storage area within the protected perimeter should be built and maintained in such a manner as not to present any risk whatsoever of polluting aquifers and springs.

4.3.13 Fuel storage area

Any storage area or tank for the storing of fuels such as coal or hydrocarbons should be designed, protected, controlled and maintained in such a manner as not to present a risk of aquifers and springs being polluted during the storage and manipulation of these fuels.

4.4 Hygiene Facilities

4.4.1 Water supply

4.4.1.1 An ample supply of potable water under adequate pressure and of suitable temperature should be available with adequate facilities for its storage, where necessary, and distribution, and with adequate protection against contamination. The standards of potability should not be less than those contained in the latest edition of "International Standards of Drinking Water" (WHO).

4.4.1.2 Natural mineral water, potable water, non potable water for steam production or for refrigeration or any other use should be carried in completely separate lines with no cross connection between them and without back siphonage. It would be desirable that these lines be identified by different colours. Steam used in direct contact with food and food contact surfaces should contain no substances which may be hazardous to health or may contaminate the food.

4.4.2 Effluent and waste disposal

Establishments should have an efficient effluent and waste disposal system which should at all times be maintained in good order and repair. All effluent lines (including sewer systems) should be large enough to carry peak loads and should be so constructed as to avoid contamination of potable water supplies.

4.4.3 Changing facilities and toilets

Adequate, suitable, and conveniently located changing facilities and toilets should be provided in all establishments. Toilets should be so designed as to ensure hygienic removal of waste matter. These areas should be well lit, ventilated and where appropriated heated, and should not open directly on to natural mineral water handling areas. Hand washing facilities with warm or hot and cold water, a suitable hand-cleaning preparation, and with suitable hygienic means of drying hands, should be provided adjacent to toilets and in such a position that the employee must pass them when returning to the processing area. Where hot and cold water are available mixing taps should be provided. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided near to each washing facility. Care should be taken that these receptacles for used paper towels are regularly emptied. Taps of a non-hand operable type are desirable. Notices should be posted directing personnel to wash their hands after using the toilet.

4.4.4 Hand washing facilities in natural mineral water processing areas

Adequate and conveniently located facilities for hand washing and drying should be provided wherever the process demands. Where appropriate, facilities for hand disinfection should also be provided. Warm or hot and cold water and a suitable hand-cleaning preparation should be provided. Where hot and cold water are available mixing taps should be provided. There should be suitable hygienic means of drying hands. Where paper towels are used, a sufficient number of dispensers and receptacles should be

provided adjacent to each washing facility. Taps of a non-hand operable type are desirable. The facilities should be furnished with properly trapped waste pipes leading to drains.

4.4.5 Disinfection facilities

Where appropriate, adequate facilities for cleaning and disinfection of working implements and equipment should be provided. These facilities should be constructed of corrosion resistant materials, capable of being easily cleaned, and should be fitted with suitable means of supplying hot and cold water in sufficient quantities.

4.4.6 Lighting

Adequate natural or artificial lighting should be provided throughout the establishment. Where appropriate, the lighting should not alter colours and the intensity should not be less than:

540 lux (50 foot candles) at all inspection points
220 lux (20 foot candles) in work rooms
110 lux (10 foot candles) in other areas.

Light bulbs and fixtures suspended over natural mineral water in any stage of production should be of a safety type and protected to prevent contamination of natural mineral water in case of breakage.

4.4.7 Ventilation

Adequate ventilation should be provided to prevent excessive heat, steam condensation and dust and to remove contaminated air. The direction of the air flow should never be from a dirty area to a clean area. Ventilation openings should be provided with a screen or other protecting enclosure of non-corrodible material. Screens should be easily removable for cleaning.

4.4.8 Facilities for storage of waste and inedible material

Facilities should be provided for the storage of waste and inedible material prior to removal from the establishment. These facilities should be designed to prevent access to waste or inedible material by pests and to avoid contamination of natural mineral water, potable water, equipment, buildings or roadways on the premises.

4.5 Equipment and Utensils

4.5.1 Materials

All equipment and utensils used in natural mineral water handling areas and which may contact the natural mineral water should be made of material which does not transmit toxic substances, odour or taste, is non-absorbent, is resistant to corrosion and is capable of withstanding repeated cleaning and disinfection. Surfaces should be smooth and free from pits and crevices. The use of wood and other materials which cannot be adequately cleaned and disinfected should be avoided except when their use would clearly not be a source of contamination. The use of different materials in such a way that contact corrosion can occur should be avoided.

4.5.2 Hygienic design, construction and installation

4.5.2.1 All equipment and utensils should be so designed and constructed as to prevent hygienic hazards and permit easy and thorough cleaning and disinfection.

SECTION V - ESTABLISHMENT: HYGIENE REQUIREMENTS

5.1 Maintenance

The buildings, equipment, utensils and all other physical facilities of the establishment, including drains, should be maintained in good repair and in an orderly condition. As far as practicable, rooms should be kept free from steam, vapour and surplus water.

5.2 Cleaning and Disinfection

5.2.1 Cleaning and disinfection should meet the requirements of this code. For further information on cleaning and disinfection procedures see Annex I, Revised Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969,Rev.1).

5.2.2 To prevent contamination of natural mineral water, all equipment and utensils should be cleaned as frequently as necessary and disinfected whenever circumstances demand.

5.2.3 Adequate precautions should be taken to prevent natural mineral water from being contaminated during cleaning or disinfection of rooms, equipment or utensils, by water and detergents or by disinfectants and their solutions. Detergents and disinfectants should be suitable for the purpose intended and should be acceptable to the official agency having jurisdiction. Any residues of these agents on a surface which may come in contact with natural mineral water should be removed by thorough rinsing with water in compliance with 7.3 of the Recommended Code of Hygienic Practice - General Principles of Food Hygiene Rev. 1 before the area or equipment is again used for handling natural mineral water.

5.2.4 Either immediately after cessation of work for the day or at such other times as may be appropriate, floors, including drains, auxiliary structures and walls of natural mineral water handling areas should be thoroughly cleaned.

5.2.5 Changing facilities and toilets should be kept clean at all times.

5.2.6 Roadways and yards in the immediate vicinity of and serving the premises should be kept clean.

5.3 Hygiene Control Programme

A permanent cleaning and disinfection schedule should be drawn up for each establishment to ensure that all areas are appropriately cleaned and that critical areas, equipment and material are designated for special attention. A single individual, who should preferably be a permanent member of the staff of the establishment and whose duties should be independent of production, should be appointed to be responsible for the cleanliness of the establishment. He should have a thorough understanding of the significance of contamination and the hazards involved. All cleaning personnel should be well-trained in cleaning techniques.

5.4 Storage and Disposal of Waste

Waste material should be handled in such a manner as to avoid contamination of natural mineral water or potable water. Care should be taken to prevent access to waste by pests. Waste should be removed from the natural mineral water handling and other working areas as often as necessary and at least daily. Immediately after disposal of the waste, receptacles used for storage and any equipment which has come into contact with the waste should be cleaned and disinfected. The waste storage area should also be cleaned and disinfected.

5.5 Exclusion of Domestic Animals

Animals that are uncontrolled or that could be a hazard to health should be excluded from establishments.

5.6 Pest Control

5.6.1 There should be an effective and continuous programme for the control of pests. Establishments and surrounding areas should be regularly examined for evidence of infestation.

5.6.2 Should pests gain entrance to the establishment, eradication measures should be instituted. Control measures involving treatment with chemical, physical or biological agents should only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health resulting from the use of these

agents, including those which may arise from residues retained in the natural mineral water. Such measures should only be carried out in accordance with the recommendations of the official agency having jurisdiction.

5.6.3 Pesticides should only be used if other precautionary measures cannot be used effectively. Before pesticides are applied, care should be taken to safeguard natural mineral water, equipment and utensils from contamination. After application, contaminated equipment and utensils should be thoroughly cleaned to remove residues prior to being used again.

5.7 Storage of Hazardous Substances

5.7.1 Pesticides or other substances which may represent a hazard to health should be suitably labelled with a warning about their toxicity and use. They should be stored in locked rooms or cabinets used only for that purpose and dispensed and handled only by authorized and properly trained personnel or by persons under strict supervision of trained personnel. Extreme care should be taken to avoid contaminating natural mineral water.

5.7.2 Except when necessary for hygienic or processing purposes, no substance which could contaminate natural mineral water should be used or stored in natural mineral water handling areas.

5.8 Personal Effects and Clothing

Personal effects and clothing should not be deposited in natural mineral water handling areas.

SECTION VI - PERSONNEL HYGIENE AND HEALTH REQUIREMENTS

6.1 Hygiene Training

Managers of establishments should arrange for adequate and continuing training of every food handler in hygienic handling of natural mineral water and in personal hygiene so that they understand the precautions necessary to prevent contamination of natural mineral water. Instruction should include relevant parts of this code.

6.2 Medical Examination

Persons who come in contact with food in the course of their work should have a medical examination prior to their employment if the official agency having jurisdiction, acting on medical advice, considers that this is necessary, whether because of epidemiological considerations, the nature of the food prepared in a particular establishment or the medical history of the prospective food handler. Medical examination of a food handler should be carried out at other times when clinically or epidemiologically indicated.

6.3 Communicable Diseases

The management should take care to ensure that no person, while known or suspected to be suffering from, or to be a carrier of a disease likely to be transmitted through food or while afflicted with infected wounds, skin infections, sores or with diarrhoea, is permitted to work in any natural mineral water handling area in any capacity in which there is any likelihood of such a person directly or indirectly contaminating food with pathogenic micro-organisms. Any person so affected should immediately report to the management that he is ill.

6.4 Injuries

Any person who has a cut or wound should not continue to handle natural mineral water or natural mineral water contact surfaces until the injury is completely protected by a waterproof covering which is firmly secured, and which is conspicuous in colour. Adequate first-aid facilities should be provided for this purpose.

6.5 Washing of Hands

Every person engaged in a natural mineral water handling area should wash his hands frequently and thoroughly with a suitable hand cleaning preparation under running warm, potable water while on duty. Hands should always be washed before commencing work, immediately after using the toilet, after handling contaminated material and whenever else necessary. After handling any material which might be capable of transmitting disease, hands should be washed and disinfected immediately. Notices requiring hand-washing should be displayed. There should be adequate supervision to ensure compliance with this requirement.

6.6 Personal Cleanliness

Every person engaged in a natural mineral water handling area should maintain a high degree of personal cleanliness while on duty, and should at all times while so engaged wear suitable protective clothing including head covering and footwear, all of which articles should be cleanable unless designed to be disposed of and should be maintained in a clean condition consistent with the nature of the work in which the person is engaged. Aprons and similar items should not be washed on the floor. During periods where natural mineral water is manipulated by hand, any jewellery that cannot be adequately disinfected should be removed from the hands. Personnel should not wear any insecure jewellery when engaged in natural mineral water handling.

6.7 Personal Behaviour

Any behaviour which could result in contamination of natural mineral water, such as eating, use of tobacco, chewing (e.g. gum, sticks, betel nuts, etc.) or unhygienic practices such as spitting, should be prohibited in natural mineral water handling areas.

6.8 Visitors

Precautions should be taken to prevent visitors to natural mineral water handling areas from contaminating food. These may include the use of protective clothing. Visitors should observe the provisions recommended in paragraphs 5.9, 6.3, 6.4 and 6.7.

6.9 Supervision

Responsibility for ensuring compliance by all personnel with all requirements of paragraphs 6.1 - 6.9 inclusive should be specifically allocated to competent supervisory personnel.

SECTION VII - ESTABLISHMENT: HYGIENIC PROCESSING REQUIREMENTS

7.1 Raw Material Requirements

To guarantee a good and stable quality of natural mineral water, certain criteria should be monitored regularly, e.g.

7.1.1 Spring discharge, temperature of the natural mineral water;

7.1.2 Appearance of the natural mineral water;

7.1.3 Odour and taste of the natural mineral water;

7.1.4 The conductance of natural mineral water or any other adequate parameter;

7.1.5 The microbiological flora;

7.2 Should there be a perceptible lack in meeting the standards, the necessary corrective measures are immediately to be taken.

7.3 Treatment

The treatment may include decantation, filtration, airing and where necessary application or offtake of carbon dioxide (CO_2).

7.3.1 Processing should be supervised by technically competent personnel.

7.3.2 All steps in the production process, including packaging, should be performed without unnecessary delay and under conditions which will prevent the possibility of contamination, deterioration, or the development of pathogenic and spoilage micro-organisms.

7.3.3 Rough treatment of containers should be avoided to prevent the possibility of contamination of the processed product.

7.3.4 Methods of preservation and necessary controls should be such as to protect against contamination or development of a public health hazard and against deterioration within the limits of good commercial practice.

7.3.5 All contaminated equipment which has been in contact with raw materials should be thoroughly cleaned and disinfected prior to being used in contact with end products.

7.4 Packaging

7.4.1 All packaging material should be stored in a clean and sanitary manner. The material should be appropriate for the product to be packed and for the expected conditions of storage and should not transmit to the product objectionable substances beyond the limits acceptable to the official agency having jurisdiction. The packaging material should be sound and should provide appropriate protection from contamination.

7.4.2 Product containers should not have been used for any purpose which may lead to contamination of the product. Where practicable containers should be inspected immediately before use to ensure that they are in a satisfactory condition and where necessary cleaned and/or disinfected; when washed they should be well drained before filling. Only packaging material required for immediate use should be kept in the packing or filling area.

7.4.3 Packaging should be done under conditions that preclude the introduction of contaminants into the product.

7.5 The methods, equipment and material used for sealing should guarantee a tight and impervious sealing and not damage the containers nor deteriorate the chemical, bacteriological and organoleptic qualities of natural mineral water.

7.6 Packaging of Containers

The packaging of containers should protect the latter from contamination and damage and allow appropriate handling and storing.

7.7 Lot Identification

Each container shall be permanently marked in code or in clear to identify the producing factory and the lot. A lot is a quantity of food produced under identical conditions, all packages of which should bear a lot number that identifies the production during a particular time interval, and usually from a particular "line" or other critical processing unit.

7.8 Processing and Production Records

Permanent, legible and dated records of pertinent processing and production details should be kept concerning each lot. These records should be retained for a period that exceeds the shelf life of the product, but unless a specific need exists they need not be kept for more than two years. Records should also be kept of the initial distribution by lot.

7.9 Storage and Transport of the End Product

The end product should be stored and transported under such conditions as will preclude contamination with and/or proliferation of micro-organisms and protect against deterioration of the product or damage to the container. During storage, periodic inspection of the end product should take place to ensure that only natural mineral water which is fit for human consumption is despatched and that end product specifications should be complied with when they exist.

7.10 Sampling and Laboratory Control Procedures

(to be elaborated)

SECTION VIII - END PRODUCT SPECIFICATIONS

(to be elaborated)

ANNEX I

EXTRACT from the Report of the FAO/WHO Working Group on the Establishment and application of Microbiological Criteria for DRIED MILK PRODUCTS and NATURAL MINERAL WATERS Washington, D.C., 10-14 November 1980

The relevance of criteria was discussed in terms of primary and secondary hygienic risks.

The primary risk is represented by the presence of recognized pathogens, such as Salmonella spp., Shigella spp., Vibrio spp., enteric viruses and protozoa that may enter waters due to fecal contamination. Some of these micro-organisms can persist in waters for some days, but are eventually inactivated.

Fecal contamination can be demonstrated by testing for the presence of indicator micro-organisms. Recent fecal contamination can be detected by the presence of fecal coliforms or Escherichia coli. There is some evidence that these bacteria can be damaged sublethally in waters, but the resuscitation of such injured bacteria in mineral waters has not yet been studied.

Fecal contamination not of recent origin can, in theory, be detected by the presence of Streptococcus spp.(Lancefield group D) and by spore-forming sulphite-reducing anaerobes. However, the Streptococcus spp. generally die more rapidly than bacterial spores and will rarely be present in detectable numbers.

Secondary hygienic risk is defined as originating from potentially pathogenic bacteria which are able to multiply to significant numbers in natural mineral waters. These are not the common foodborne pathogens such as Salmonella spp., Staphylococcus aureus and Clostridium perfringens. Enteric pathogens are rarely found in bottled waters and cannot multiply in this environment. This, coupled with the usefulness of indicator organisms for fecal pollution, makes criteria for these pathogens unnecessary. Only a few species of gram-negative bacteria other than the Enterobacteriaceae can multiply after a period of adaptation, in waters of extremely low nutrient content. Reports indicate that, especially, Pseudomonas aeruginosa and P. cepacia can grow in such waters. Typically, they are mesophiles and can multiply at temperatures above 42°C. Both these species as well as certain other mesophilic Pseudomonas spp. and Flavobacterium meningosepticum are pathogens, but their pathogenicity by the oral route has not been demonstrated. The other psychrotrophic water bacteria, which cannot grow at 40°C and above, are not of public health relevance.

On the basis of the above considerations, the following end-product specifications were considered for inclusion in the Draft Code of Hygienic Practice for the Collecting, Processing and Marketing of Natural Mineral Waters.

TABLE 1 - END PRODUCT SPECIFICATIONS CONSIDERED BY THE WORKING GROUP

	Incubation temperature	n	c	m	Method
1. Coliforms	37°C	5 (x250 ml)	0	0	See CX/FH 79/4, Add. 1
2. Escherichia coli	44°C	5 (x250 ml)	0	0	
3. Streptococcus spp. (Lancefield Group D)	37°C	5 (x250 ml)	0	0	
4. Spore-forming sulphite-reducing anaerobic bacteria	42°C	5 (x50 ml)	1	0	
5. Pseudomonas aeruginosa	42°C	5 (x250 ml)	0	0	
6. Mesophilic bacteria, capable of multiplying in 10 x diluted plate count medium	42°C	5 (x250 ml)	0	0	

RECOMMENDATIONS

The Working Group recommends End Product Specifications Item No. 1 in table for all lots of mineral water.

End Product Specification No. 2 (testing for E. coli) is not recommended. End Product Specification No. 6 (testing for mesophilic bacteria in dilute medium) is preferred to the combined use of Specifications Nos. 3, 4 and 5.

Reasons for recommendations

The coliform test (Specification No. 1) is recommended because it will detect contamination of both fecal and non-fecal origins. Specification No. 2 (for E. coli) is considered redundant when the coliform test with m=0 and c=0 is applied.

Although a method for the detection of Pseudomonas aeruginosa is included in the Regional Standard, no accepted standard method exists. The Working Group has recommended the use of the 10-fold diluted plate count medium (modified ISO 4833) method (42°C, 44 ± 4 hours) because it will detect those potential pathogens (including P. aeruginosa) that are capable of growing in water (see WG/Microbiol/80/1). If this method were adopted, a test for P. aeruginosa (for which no standard method exists) could be omitted. Then Specifications Nos. 3 and 4 could also be omitted since the test used for Specification No. 6 is more sensitive for isolating persistent indicator micro-organisms. The diluted medium method for mesophilic bacteria has been found to be reliable for the sources examined to date, but has not yet been fully evaluated (see WG/Microbiol/80/1).

GUIDELINES

For in-plant monitoring of critical control points, the producers of natural mineral waters are advised to test the microbiological quality of their waters at least at source and within 12 hours after bottling, as stated in ALINORM 78/19, Appendix II, Annex I, "Criteria for Microbiological Analyses of Source", Draft European Regional Standard for Natural Mineral Waters.

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR DRIED MILK 1/

(Retained at Step 6)

SECTION I - SCOPE

1. The Code of Practice applies to dried milk products as defined. It recommends general hygiene and technological practices for use in the handling (including the production, preparation, processing, packaging, storage, transport and distribution) of dried milk products for human consumption to ensure safe, sound and wholesome dried milk products.

SECTION II - DEFINITIONS

2. For the purposes of this Code the following expressions have the meaning stated:

2.1	Adequate	sufficient to accomplish the intended purpose of this Code.
2.2	Cleaning	the removal of food residues, soil, dirt, grease or other objectionable matter.
2.3	Contamination	the occurrence of any objectionable matter in the product.
2.4	Disinfection	the reduction, without adversely affecting the food by means of hygienically satisfactory chemical agents and/or physical methods, of the number of micro-organisms to a level that will not lead to harmful contamination of food.
2.5	Dried milk	roller dried or spray dried milk products or composite milk products as defined in Articles 2 and 3 respectively of the Code of Principles concerning Milk and Milk Products, Seventh Edition (CAC/M 1-1973).
2.6	Establishment	any building(s) or area(s) in which dried milk products are prepared, processed, handled, packed or stored and the surroundings under the control of the same management.
2.7	Food Handling	any operation in the production, preparation, processing, packaging, storage, transport and distribution and sale of food.

1/ For the convenience of the reader, those portions of the Revised General Principles of Food Hygiene (CAC/RCP 1-1969 Rev. 1) which are applicable to this Code are written in full. Sidelined portions indicate material which is particular to this Code of Hygienic Practice.

2.8 Liquid milk products — except for milk, the raw materials from which dried milk products are prepared, including intermediate evaporated or concentrated products used in the process of preparing dried milk products.

2.9 Pasteurization — heating:

(i) milk, skimmed milk or whey to a minimum temperature of 72°C for at least 15 seconds.

(ii) milk products which have a higher milk fat content than milk and/or containing added sweeteners may require a higher time/temperature combination depending on the composition of the mixture. A typical time/temperature combination for e.g. cream (18% fat) is 75°C for 15 seconds.

(iii) concentrated milk and concentrated milk products to at least a minimum temperature of 80°C for at least 25 seconds;

or treating at a time/temperature relationship sufficient to ensure equivalent destruction of micro-organisms.

2.10 Pests — any animals capable of directly or indirectly contaminating food.

SECTION III - HYGIENE REQUIREMENTS IN THE MILK PRODUCTION AREA

Hygienic considerations in regard to milk production are not covered in this Code.

For Raw Material Requirements, see Section VII of this Code.

SECTION IV - ESTABLISHMENT: DESIGN AND FACILITIES

4.1 Location

Establishments should be located, in areas which are free from objectionable odours, smoke, dust or other contaminants and are not subject to flooding.

4.2 Roadways and Yards

Roadways and yards serving the establishment and which are within its bounderies or in its immediate vicinity should have a hard paved surface suitable for wheeled traffic. There should be adequate drainage and provision should be made to allow for cleaning.

4.3 Buildings and Facilities

4.3.1 Buildings and facilities should be of sound construction and maintained in good repair.

4.3.2 Adequate working space should be provided to allow for satisfactory performance of all operations.

4.3.3 The design should be such as to permit easy and adequate cleaning and to facilitate proper supervision of food bygiene.

4.3.4 The buildings and facilities should be designed to prevent the entrance and harbouring of pests and the entry of environmental contaminants such as smoke, dust, etc.

4.3.5 Buildings and facilities should be designed to provide separation, by partition, location or other effective means, between those operations which may cause cross-contamination.

4.3.6 Buildings and facilities should be designed to secure hygienic operations by means of a regulated flow in the process from the arrival of the raw material at the premises to the finished product, and should provide for appropriate temperature conditions for the process and the product.

4.3.7 In food handling areas:

- Floors, where appropriate, should be of water-proof, non-absorbent, washable, non-slip and non-toxic materials, without crevices, and should be easy to clean and disinfect. Where appropriate, floors should slope sufficiently for liquids to drain to trapped outlets.
- Walls, where appropriate, should be of water-proof, non-absorbent, washable and non-toxic materials and should be light coloured. Up to a height appropriate for the operation they should be smooth and without crevices, and should be easy to clean and disinfect.
- Ceilings should be so designed, constructed and finished as to prevent the accumulation of dirt and minimize condensation, mould development and flaking, and should be easy to clean.
- Windows and other openings should be so constructed as to avoid accumulation of dirt and those which open should be fitted with screens. Screens should be easily movable for cleaning and kept in good repair. Internal window sills, if present, should be sloped to prevent use as shelves. In rooms where products may be exposed or where there are air inlets to dryers and other equipment, windows should remain closed whenever such equipment is in use, but care should be taken to ensure that the rooms are adequately ventilated.
- Doors should have smooth, non-absorbent surfaces, and, where appropriate, be self-closing and close fitting.
- Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes, should be so situated and constructed as not to cause contamination to food. Chutes should be constructed with inspection and cleaning hatches.

4.3.8 In food handling areas all overhead structures and fittings should be installed in such a manner as to avoid contamination directly or indirectly of food and raw materials by condensation and drip, and should not hamper cleaning operations. They should be insulated where appropriate and be so designed and finished as to prevent the accumulation of dirt and to minimize condensation, mould development and flaking. They should be easy to clean.

4.3.9 Living quarters, toilets and areas where animals are kept, should be completely separated from and should not open directly on to food handling areas.

4.3.10 Where appropriate, establishments should be so designed that access can be controlled.

4.3.11 The use of material which cannot be adequately cleaned and disinfected, such as wood, should be avoided, unless its use would clearly not be a source of contamination.

4.4 Sanitary Facilities

4.4.1 Water Supply

4.4.1.1 An ample supply of water in compliance with section 7.3 of this Code under adequate pressure and of suitable temperature should be available with adequate facilities for its storage where necessary and distribution, and with adequate protection against contamination. The standards of potability should not be less than those contained in the latest edition of "International Standards of Drinking Water"(WHO).

4.4.1.2 Non-potable water should be carried in completely separate lines, identifiable preferably by colour, and with no cross-connection with or back-siphonage into the system carrying potable water. It should not be possible to connect lines carrying non-potable water to any equipment or cleaning-disinfection apparatus used in handling food. The facilities for non-potable water should be approved by the official agency having jurisdiction.

4.4.2 Steam

4.4.2.1 An adequate supply of steam, or other heating medium, should be provided to ensure satisfactory operation of all heat treatment, evaporating and drying equipment during the production of dried milk products, and also provide the necessary heat for cleaning, disinfection and other operations.

4.4.2.2 Steam used in direct contact with food or food contact surfaces should contain no substances including volatile boiler water compounds which may be hazardous to health or may contaminate the food.

4.4.3 Refrigeration

Sufficient refrigeration capacity should be available to chill and maintain raw and pasteurized milk and liquid milk products at a temperature sufficiently low to ensure no adverse effect on the hygienic quality of the product (see 7.4.3).

4.4.4 Air

An adequate supply of air should be provided for the drying, conveying, cooling or air-sweeping of the product. Where necessary, precautions should be taken to remove oil, moisture, dirt, micro-organisms, insects, odours and all other objectionable matter, from such air. Compressed air which comes into contact with milk products or product contact surfaces should also conform to these requirements.

4.4.5 Effluent and waste disposal

Establishments should have an efficient effluent and waste disposal system which should at all times be maintained in good order and repair. All effluent lines (including sewer systems) should be large enough to carry peak loads and should be so constructed as to avoid contamination of potable water supplies.

4.4.6 Changing facilities and toilets

Adequate, suitable and conveniently located changing facilities and toilets should be provided in all establishments. Toilets should be so designed as to ensure hygienic removal of waste matter. These areas should be well lit, ventilated and where appropriate heated and should not open directly onto food handling areas. Hand washing facilities with warm or hot and cold water, a suitable hand cleaning preparation, and with suitable hygienic means of drying hands should be provided adjacent to toilets, and in such a position that the employee must pass them when returning to the processing area. Where hot and

cold waterare available mixing taps should be provided. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided near to each washing facility. Taps of a non-hand operable type are desirable. Notices should be posted directing personnel to wash their hands after using the toilet.

4.4.7 Hand washing facilities in processing areas

Adequate and conveniently located facilities for hand washing and drying should be provided wherever the process demands. Where appropriate, facilities for hand disinfection should also be provided. Warm or hot and cold water and a suitable hand-cleaning preparation should be provided. Where hot and cold waterare available mixing taps should be provided. There should be suitable hygienic means of drying hands. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided adjacent to each washing facility. Taps of a non-hand operable type are desirable. The facilities should be furnished with properly trapped waste pipes leading to drums.

4.4.8 Disinfection facilities

Where appropriate, adequate facilities for cleaning and disinfection of working implements and equipment should be provided. These facilities should be constructed of corrosion-resistant materials, capable of being easily cleaned, and should be fitted with suitable means of supplying warm and cold water in sufficient quantities.

4.4.9 Lighting

Adequate natural or artificial lighting which does not alter colours should be provided throughout the establishment. Where appropriate, the lighting should not alter colours and the intensity should not be less than:

540 lux (50 foot candles) at all inspection points

220 lux (20 foot candles) in work rooms

110 lux (10 foot candles) in other areas

Light bulbs and fixtures suspended over food materials in any stage of production should be of a safety type and protected to prevent contamination of food in case of breakage.

4.4.10 Ventilation

Adequate ventilation should be provided to prevent excessive heat, steam, condensation and dust and to remove contaminated air. The direction of the air flow should never be from a dirty area to a clean area. Ventilation openings should be provided with a screen or other protecting enclosure of non-corrodible material. Screens should be easily removable for cleaning.

4.4.11 Facilities for storage and disposal of waste and inedible material

Facilities should be provided for the storage of waste and inedible material prior to removal from the establishment. These facilities should be designed to prevent access to waste or inedible material by pests and to avoid contamination of food, potable water, equipment, buildings or roadways.

4.5 Equipment and Utensils

4.5.1 Materials

All equipment and utensils used in food handling areas and which may contact food should be made of material which does not transmit toxic substances, odour or taste, is non-absorbent, is resistant to corrosion and is capable of withstanding repeated cleaning and disinfection. Surfaces should be smooth and

free from pits and crevices. The use of wood and other materials which cannot be adequately cleaned and disinfected should be avoided except when their use would clearly not be a source of contamination. The use of different materials in such a way that contact corrosion can occur should be avoided.

4.5.2 Sanitary design, construction and installation

4.5.2.1 All equipment and utensils should be so designed and constructed as to prevent hygienic hazards and permit easy and thorough cleaning and disinfection and, where practicable, be visible for inspection. Stationary equipment should be installed in such a manner as to permit easy access and thorough cleaning.

Equipment should be designed to minimize build-up of moisture or dried product in dryers, lines, bins and packaging equipment.

4.5.2.2 Containers for inedible material and waste should be leak proof, constructed of metal or other suitable impervious material which should be easy to clean, or disposable and able to be closed securely.

4.5.2.3 **The equipment for pasteurizing milk and liquid milk products should be provided with a thermometer and an automatic temperature recorder, a flow diversion valve or pump "cut out" as well as a positive pump or timing device to ensure that the proper time/temperature combination is maintained.**

4.5.2.4 **Sensors of the temperature measuring devices should be so positioned as to measure the temperature of the milk or milk products on the completion of the holding section of the pasteurizing or pre-heating process.**

4.5.2.5 Facilities for the convenient withdrawal of samples for the purpose of control of effective pasteurizing or heat-treatment should be provided **where necessary.**

4.5.2.6 All refrigerated spaces should be equipped with temperature measurement or recording devices.

4.5.3 Thermometers and Recording Devices

4.5.3.1 Thermometers which include glass in their construction should not be used in any application where glass may come into contact with milk or milk products.

4.5.3.2 Thermometers, temperature recorders and similar instruments should be calibrated against a reference instrument upon installation and periodically at adequate intervals to ensure **effective operation.**

4.5.4 Spray dryers

4.5.4.1 Spray dryers should be equipped with adequate air intake filters. Air which is drawn into the dryer should comply with the requirements of Section 4.4.4. In direct gas-fired dryers, precautions should be taken to ensure complete combustion to prevent contamination of the product.

4.5.4.2 Exhaust air from dryers should be treated to remove milk solids which may otherwise contaminate factory buildings and surroundings.

4.5.5 Equipment identification

Equipment and utensils used for inedible or discarded materials should be so identified and should not be used for edible products.

SECTION V - ESTABLISHMENT: HYGIENE REQUIREMENTS

5.1 Maintenance

The buildings, equipment, utensils and all other physical facilities of the establishment, including drains, should be maintained in good repair and in an orderly condition. As far as practicable, rooms should be kept free from steam, vapour and surplus water. Storage rooms should be kept dry.

5.1.2 Special attention should be paid to the maintenance of roofs, guttering and drainage in the area surrounding the exhausts of dryers to prevent the accumulation of milk solids and the subsequent contamination of the area.

5.1.3 Spray dryers should be regularly inspected for cracks.

5.2 Cleaning and Disinfection

5.2.1 Cleaning and disinfection should meet the requirements of this Code. For further information on cleaning and disinfection procedures see Annex 1 to the Recommended Code of Practice - Revised General Principles of Food Hygiene.

5.2.2 To prevent contamination of food, all equipment and utensils should be cleaned as frequently as necessary and disinfected whenever circumstances demand.

All wet product contact surfaces should be cleaned immediately after use. Dry product contact surfaces should be dry-cleaned by a technique appropriate to the equipment concerned immediately after use, and should be wet-cleaned only as necessary. Where necessary, equipment should be disassembled for cleaning. In general, in-place cleaning is recommended particularly for spray dryers.

5.2.3 Metallic cleaning materials such as steel wool should not be used in the cleaning of dairy equipment or utensils.

5.2.4 Equipment and pipelines which are cleaned in place should first be rinsed with water at a temperature of 40° to 45°C to remove product residues. Spray nozzles should be examined periodically to ensure efficient distribution of detergent and disinfectant.

Air filters should be checked and cleaned regularly to ensure effective performance.

5.2.5 Cleaned equipment and utensils should normally be disinfected immediately before use, by physical or chemical agents as appropriate to the equipment and nature of the product. In the case of dry product equipment disinfection immediately before use may not always be necessary. Where chemical agents are used, the equipment should be drained and then rinsed with water in compliance with Section 7.3 of this Code (See also section 7.4.11).

5.2.6 Special clean protective clothing and shoe covers should be used by any person entering the chamber of the spray dryer for the purpose of cleaning or maintenance.

5.2.7 Adequate precautions should be taken to prevent food from being contaminated during cleaning or disinfection of rooms, equipment or utensils by water and detergents or by disinfectants and their solutions. Detergents and disinfectants should be suitable for the purpose intended and should be acceptable to the official agency having jurisdiction. Any residues of these agents on a surface which may come in contact with food should be removed by thorough rinsing with water in compliance with Section 7.3 of this Code before the area or equipment is again used for handling foods.

5.2.8 Either immediately after cessation of work for the day or at such other times as may be appropriate, floors, including drains, auxiliary structures and walls of food handling areas should be thoroughly cleaned.

5.2.9 Changing facilities and toilets should be kept clean at all times.

5.2.10 Roadways and yards in the immediate vicinity of and serving the premises should be kept clean.

5.3 Hygiene Control Programme

A permanent cleaning and disinfection schedule should be drawn up for each establishment to ensure that all areas are appropriately cleaned and that critical areas, equipment and material are designated for special attention. A single individual who should preferably be a permanent member of the staff of the establishment and whose duties should be independent of production, should be appointed to be responsible for the cleanliness of the establishment. He/she should have a thorough understanding of the significance of contamination and the hazards involved. All cleaning personnel should be well trained in cleaning techniques.

5.4 Storage and Disposal of Waste

Waste material should be handled in such a manner as to avoid contamination of food or potable water. Care should be taken to prevent access to waste by pests. Waste should be removed from the food handling and other working areas as often as necessary and at least daily. Immediately after disposal of the waste, receptacles used for storage and any equipment which has come into contact with the waste, should be cleaned and disinfected. The waste storage area should also be cleaned and disinfected.

5.5 Exclusion of Domestic Animals

Animals that are uncontrolled or that could be a hazard to health should be excluded from establishments.

5.6 Pest Control

5.6.1 There should be an effective and continuous programme for the control of pests. Establishments and surrounding areas should be regularly examined for evidence of infestation.

5.6.2 Should pests gain entrance to the establishment, eradication measures should be instituted. Control measures involving treatment with chemical, physical or biological agents should only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health resulting from the use of these agents, including those which may arise from residues retained in the product. Such measures should only be carried out in accordance with the recommendations of the official agency having jurisdiction.

5.6.3 Pesticides should only be used if other precautionary measures cannot be used effectively. Before pesticides are applied, care should be taken to safeguard all food, equipment and utensils from contamination. After application, contaminated equipment and utensils should be thoroughly cleaned to remove residues prior to being used again.

5.7 Storage of Hazardous Substances

5.7.1 Pesticides or other substances which may represent a hazard to health should be laballed with a warning about their toxicity and use. They should be stored in locked rooms or cabinets, used only for that purpose, and dispensed and handled only by authorized and properly trained personnel or by persons under strict supervision of trained personnel. Extreme care should be taken to avoid contaminating food.

5.7.2 Except when necessary for hygienic or processing purposes, no substance which could contaminate food should be used or stored in food handling areas.

5.8 Personal Effects and Clothing

Personal effects and clothing should not be deposited in processing areas.

SECTION VI - PERSONNEL: HYGIENE AND HEALTH REQUIREMENTS

6.1 Hygiene Training

Managers of establishments should arrange for adequate and continuing training of every food handler in hygienic handling of food and in personal hygiene so that they understand the precautions necessary to prevent contamination of food. Instruction should include relevant parts of this Code.

6.2 Medical Examination

Persons who come in contact with food in the course of their work should have a medical examination prior to their employment if the official agency having jurisdiction, acting on medical advice, considers that this is necessary, either because of epidemiological considerations, the nature of the food prepared in a particular establishment or the medical history of the prospective food handler. Medical examination of a food handler should be carried out at other times when clinically or epidemiologically indicated.

6.3 Communicable Diseases

The management should take care to ensure that no person, while known or suspected to be suffering from, or to be a carrier of a disease likely to be transmitted through food or while afflicted with infected wounds, skin infections, sores or with diarrhea is permitted to work in any food handling area in any capacity in which there is any likelihood of such a person directly or indirectly contaminating food with pathogenic microorganisms. Any person so affected should immediately report to the management that he/she is ill.

6.4 Injuries

Any person who has a cut or wound should not continue to handle food or food contact surfaces until the injury is completely protected by a waterproof covering which is firmly secured, and which is conspicuous in colour. Adequate first-aid facilities should be provided for this purpose.

6.5 Washing of Hands

Every person engaged in a food handling area should wash his/her hands frequently and thoroughly with a suitable hand cleaning preparation under running warm water in compliance with section 7.3 of this Code while on duty. Hands should always be washed before commencing work, immediately after using the toilet, after handling contaminated material and whenever else necessary. After handling any material which might be capable of transmitting disease, hands should be washed and disinfected immediately. Notices requiring hand-washing should be displayed. There should be adequate supervision to ensure compliance with this requirement.

6.6 Personal Cleanliness

Every person engaged in a food handling area should maintain a high degree of personal cleanliness while on duty, and should at all times while so engaged wear suitable protective clothing including head covering and footwear, all of which articles should be cleanable unless designed to be disposed of and should be maintained in a clean condition consistent with the nature of the work in which the person is engaged. Aprons and similar items should not be washed on the floor. During periods when food is manipulated by hand, any jewellery that cannot be adequately disinfected should be

removed from the hands. Personnel should not wear any insecure jewellery when engaged in food handling.

6.7 Personal Behaviour

Any behaviour which could result in contamination of food, such as eating, use of tobacco, chewing (e.g.: gum, sticks, betel nuts, etc.) or unhygienic practices such as spitting, should be prohibited in food handling areas.

6.8 Gloves

Gloves, if used in the handling of food products, should be maintained in a sound, clean and sanitary condition. The wearing of gloves does not exempt the operator from having thoroughly washed hands.

6.9 Visitors

Precautions should be taken to prevent visitors to food handling areas from contaminating food. These may include the use of protective clothing. Visitors should observe the provisions recommended in paragraphs 5.8 to 6.8.

6.10 Supervision

Responsibility for ensuring compliance with all requirements of paragraphs 5.8-6.9 inclusive should be specifically allocated to competent supervisory personnel.

SECTION VII - ESTABLISHMENT: HYGIENIC PROCESSING REQUIREMENTS

7.1 Raw Material Requirements

7.1.1 All milk used in the manufacture of dried milk products should have been produced under hygienic conditions in compliance with the provisions of the official agency having jurisdiction.

7.1.2 No milk which has been contaminated, or subjected to the addition of any harmful substances which render it unfit for human consumption, should be accepted for processing.

7.1.3 No milk or liquid milk product should be accepted by an establishment unless it has been derived from healthy animals. Milk from animals which have been treated with antibiotics and other drugs should be excluded for a period adequate to prevent contamination of the milk.

7.1.4 Inspection should be carried out on incoming milk and milk products to ensure that raw materials are satisfactory for processing.

7.1.5 Where necessary, laboratory tests should be made of the ingredients prior to their use.

7.1.6 Raw materials and other ingredients stored on the premises of the establishment should be maintained under conditions that will prevent spoilage, protect against contamination and minimise damage. Stocks of raw materials and ingredients should be properly rotated.

7.2 Prevention of Cross-Contamination

7.2.1 Effective measures should be taken to prevent contamination of pasteurized products by direct or indirect contact with material at an earlier stage of the process.

7.2.2 Persons handling raw milk or other raw materials or semi-processed products capable of contaminating the end product should not come into contact with any end product unless and until they discard all protective clothing worn by them during the handling of raw materials or semi-processed products which have come into direct contact with or have been soiled by raw material or semi-processed products and they have changed into clean protective clothing.

7.2.3 If there is a likelihood of contamination, hands should be washed thoroughly between handling products at different stages of processing.

7.2.4 All equipment which has been in contact with raw materials or contaminated material should be thoroughly cleaned and disinfected before being used for contact with pasteurized products.

7.2.5 Every department in which any dried milk product is prepared, processed or stored should be used at that time only for that purpose or for the preparation of other dried milk products or products subject to the same hygiene requirements.

7.3 Use of Water

7.3.1 As a general principle only potable water as defined in the latest edition of "International Standards of Drinking Water" (WHO) should be used in food handling.

7.3.2 Non-potable water may be used with the acceptance of the official agency having jurisdiction for steam production, refrigeration, fire control and other similar purposes not connected with food. However, non-potable water may, with specific acceptance by the official agency having jurisdiction, be used in certain food handling areas provided this does not constitute a hazard to health.

7.3.3 Water recirculated for re-use within an establishment should be treated and maintained in a condition so that no health hazard can result from its use. The treatment process should be kept under constant surveillance. Alternatively, recirculated water which has received no further treatment may be used in conditions where its use would not constitute a health hazard and will not contaminate either the raw material or the end product. Recirculated water should have a separate distribution system which can be readily identified. The acceptance of the official agency having jurisdiction should be required for any treatment process and for the use of recirculated water in any food process.

7.4 Processing

7.4.1 Processing should be supervised by technically competent personnel.

7.4.2 All steps in the production process, including packaging, should be performed without unnecessary delay and under conditions which will prevent the possibility of contamination, deterioration, or the development of pathogenic and spoilage micro-organisms.

7.4.3 After inspection and testing, incoming milk or liquid milk products should be processed directly or, if this is not possible, cooled to and held until processing at a temperature sufficiently low to prevent significant microbial growth. Milk which is in cans should be transferred to bulk holding tanks and cooled without delay.

7.4.4 Adequate heat-treatment facilities should be provided. All milk and liquid milk products should be pasteurized prior to concentrating.

7.4.6 The concentrated product leaving the evaporator should be fed directly to the dryer. If this is not possible for technical reasons it should be stored under such conditions of time and temperature as will prevent development of micro-organisms and toxins during storage. Twin feed-balance tanks should be used alternatively and all feed-balance tanks should be cleaned and sterilized at intervals not exceeding four hours.

7.4.7 Concentrated products may be transported to the drying plant, provided that, where necessary, they are pasteurized before drying. It should be recognized however that pasteurization reduces the number of viable micro-organisms, but may not destroy some toxins.

7.4.8 A continuous chart recording should be made of all pasteurization and heat-treatment steps, and these charts should be dated and kept available for inspection for a period that exceeds the shelf life of the product, but unless a specific need exists they need not be kept for more than two years.

7.4.9 When breakdowns or unplanned discontinuities in processing occur which disrupt the normal flow of the product, the batch should not be released for human consumption unless it is of acceptable hygienic quality. Re-processing, diversion to non-human use or additional testing may be required.

7.4.10 Dried milk products recovered from equipment and whichare not obtained as part of the normal continuous process should not be included in the end-product, unless the recovery process is so managed as to preserve the hygienic status of such material.

7.5 Packaging

7.5.1 All packaging material should be stored in a clean and sanitary manner. The material should be appropriate for the product to be packed and for the expected conditions of storage and should not transmit to the product objectionable substances beyond the limits acceptable to the official agency having jurisdiction. The packaging material should be sound and should provide appropriate protection from contamination.

7.5.2 Product containers should not have been used for any purpose which may lead to contamination of the product. Where practicable containers should be inspected immediately before use to ensure that they are in a satisfactory condition and where necessary cleaned and/or disinfected; when washed they should be well drained before filling. Only packaging material required for immediate use should be kept in the packing or filling area.

7.5.3 Precaution should be taken to minimise product dust and spillage. The packages should be closed immediately after filling or gassing, and the exteriors should be brushed or cleaned where necessary to remove any product dust.

7.5.4 Packaging should be done under conditions that preclude the introduction of contamination into the product.

7.5.5 Lot Identification

Each container shall be permanently marked in code or in clear to identify the producing factory and the lot. A lot is a quantity of food produced under identical conditions, all packages of which should bear a lot number that identifies the production during a particular time interval, and usually from a particular "line" or other critical processing unit.

7.5.6 Processing and Production Records

Permanent, legible and dated records of pertinent processing and production details should be kept concerning each lot. These records should be retained for a period that exceeds the shelf life of the product, but unless a specific need exists they need not be kept for more than two years. Records should also be kept of the initial distribution by lot.

7.6 Storage and Transport of the End Product

7.6.1 The end product should be stored and transported under such conditions as will preclude contamination with and/or proliferation of micro-organisms and protect against deterioration of the product or damage to the container.

7.6.2 Storage should be in such a manner and in such containers as to prevent moisture absorption. During storage, periodic inspection of the product should take place to ensure that only food which is fit for human consumption is despatched and that end-product specifications should be complied with. The product should be despatched in the sequence of lot numbers.

7.7 Sampling and Laboratory Control Procedures

7.7.1 The establishment should have access to adequate laboratory facilities to carry out testing routine needed to guarantee continuous and effective control of all operations.

7.7.2 Where appropriate representative samples of the production should be taken to assess the safety and quality of the product.

7.7.3 The laboratory should at least monitor:

(i) Incoming milk and liquid milk products.
(ii) Other ingredients.
(iii) Processing and manufacturing stages.
(iv) Cleaning and disinfection in the plant.
(v) Finished products.
(vi) Water quality.
(vii) Calibration of instruments, for example, gauges, thermometers, etc.
(viii) Packaging materials.
(ix) Air quality.
(x) Steam quality.

7.7.4 Laboratory analytical procedures should preferably follow recognized or standard methods in order that the results may be readily interpreted. In many cases Codex methods are available.

7.7.5 Testing for pathogenic micro-organisms should be done within the confines of the establishment only when adequate precautions have been taken to ensure that no contamination of the product arising from the laboratory is possible.

7.7.6 The results of microbiological examinations should be consistently monitored and in the event of a significant deviation from the normal characteristics appropriate action, including more detailed investigation, should be undertaken immediately.

7.7.7 The records of the examinations should be kept at each establishment for a period that exceeds the shelf life of the product, but unless a specific need exists they need not be kept for more than two years. It would also be appropriate to retain the records of examinations relating to the various manufacturing processes. All records should be available for inspection if so required. Means of identifying batches with samples should also be provided.

7.7.8 The person in charge of hygiene control should have authority commensurate with the responsibilities associated with planning, coordinating, executing and

maintaining the establishment hygiene control programme and he should have a thorough understanding of the significance of contamination and the hazards involved.

SECTION VIII - END PRODUCT SPECIFICATIONS

8 Standard methods should be used for sampling and examination to determine the compliance with the following specifications:

8.1 To the extent possible in good manufacturing practice, the products should be free from objectionable matter.
They should not contain any substances in amounts which may represent a hazard to health.

8.2 (a) When tested by appropriate methods of sampling and examination the products should be free from micro-organisms in amounts which may represent a hazard to health; and

(b) should not contain any substances originating from micro-organisms, particularly aflatoxins, in amounts which exceed the tolerances or criteria established by the official agency having jurisdiction.

8.3 Microbiological Criteria
Dried milk products should comply with the microbiological criteria in Annex I.

ANNEX I

DRAFT MICROBIOLOGICAL CRITERIA FOR DRIED MILK PRODUCTS

This draft proposal for microbiological criteria for dried milk products contains:

(1) Microbiological end-product specifications.
(2) Microbiological guidelines.

Note: This proposal does not apply to dried milk products intended for use by high risk populations such as infants and children, invalids and geriatrics. These are special diatary foods and therefore are not covered herein.

MICROBIOLOGICAL END-PRODUCT SPECIFICATIONS

A microbiological end-product specification serves as a guide to the official agency having jurisdiction and is intended to increase assurance that the provisions of hygienic significance in the Code have been met. It may include micro-organisms which are not of direct public health significance.

1. Sampling Plans and Microbiological Limits

Salmonellae: Salmonella organisms should not be recovered from any of [15] sample units examined when the test is carried out acoording to the method described. 1/
(n = 15, c = 0, m = 0)

1/ The method described requires sample units of 25 grammes.

Mesophilic Aerobic Bacteria:

When examined by the method described, mesophilic aerobic bacteria should not be recovered:

(a) from any of the five samples tested in a number exceeding 200,000 per gramme; and

(b) from more than two of the five samples tested in a number exceeding 50,000 per gramme.
(n = 5, c = 2, m = 50,000, M = 200,000)

Coliform Bacteria:

When examined by the method described, coliform bacteria should not be recovered:

(a) from any of the five samples tested in a number exceeding 100 per gramme; and

(b) from more than one of the five samples tested in a number exceeding 10 per gramme.
(n = 5, c = 1, m = 10, M = 100)

2. Number of Field Samples from a Lot 1/

Take [15] field samples, all of which are used for detection of salmonellae, and select at random 5 of these field samples to be examined also for mesophilic aerobic bacteria and coliform bacteria.

3. Sampling Methods

For all dried milk products take field samples of at least [200] grammes.

Equipment: Sterile trier long enough to reach to the bottom of containers to be sampled. Sterile sample containers with tight closures, sterile spoon, alcohol lamp or other burner, cotton, clean cloth or towel and water pail.

Methods:

For small packages, randomly take one unopened package for each of the field samples required. If the net weight of the package is less than 200 g. take as many unopened packages as required to make at least 200 g. for each field sample. For larger containers, such as boxes, bags, etc., remove top layer with sterile spoon or other sterile implement, and with a sterile trier remove at least 3 cores from the centre, midway between the centre and the periphery, and from the periphery respectively. Aseptically transfer the cores to a sterile container. Samples should be stored in a refrigerated or cool place until analysis takes place.

4. Reference Methods

4.1 Detection of Salmonellae

Dried whole milk, dried skim milk, and similar products. The method is that of ISO (DIS 6779).

4.2 Enumeration of mesophilic aerobic bacteria

Dried whole milk, dried skim milk, dried whey, and similar products. The method is the reference method of the International Dairy Federation; ref. FIL-IDF 49:1970.

1/ A lot is a quantity of food produced under identical conditions, all packages of which should bear a lot number that identifies the production during a particular time interval, and usually from a particular "line" or other critical processing unit.

4.3 Enumeration of coliform bacteria

Dried whole milk, dried skim milk, dried whey, and similar products. The method is the reference method of the International Dairy Federation; ref. FIL-IDF 64:1971.

MICROBIOLOGICAL GUIDELINES

Microbiological guideline is applied at the establishment at a specified point during or after processing to monitor hygiene. It is intended to guide the manufacturer and is not to be used for official control purposes. It may include micro-organisms other than those regarded in the criteria for microbiological standards and end-product specifications.

5. Sampling Plans and Microbiological Limits

5.1 Field samples and sampling methods

For all dried milk products covered by this Code, take 5 field samples, each of [200] grammes from each lot or day's production. Take samples in accordance with Section 3 of this Annex.

5.2 Methods

The reference methods given in Section 4 of this Annex may be used, except that a modified test for the presence or absence of coliform bacteria is preferred.

5.3 Sampling plans and microbiological limits

Five equal field samples taken from the batch should be pooled aseptically. The resulting composited sample should conform to the following limits:

Salmonellae: Salmonella should not be recovered from [100] grammes of the composited sample when the test is carried out according to the method described.

Coliform bacteria: Coliform bacteria should not be recovered from [0.1 g.] of the composited sample when tested by an appropriate method.

Mesophilic aerobic bacteria: Mesophilic aerobic bacteria should not be recovered from the sample unit examined in a number exceeding [50,000] per gramme when the test is carried out by the method described.

EXTRACT from the Report of the FAO/WHO Working Group
on the Establishment and application of Microbiological
Criteria for DRIED MILK PRODUCTS and NATURAL MINERAL WATERS
Washington, D.C., 10-14 November 1980

3. MICROBIOLOGICAL CRITERIA FOR DRIED MILK

3.1 Background to the Development of the Code of Hygienic Practice for Dried Milk

The decision to begin work on a Code of Hygienic Practice for Dried Milk arose out of discussion at the 17th session of the Joint FAO/WHO Committee of Government Experts, on the Code of Principles concerning Milk Products ("The Milk Committee") which met in Rome in 1975 almost immediately after the first session of the present working group which had proposed end product specifications for inclusion in the Code of Hygienic Practice for Egg Products.

The Milk Committee agreed that there was need to consider the hygienic aspects of certain milk products and the delegation of Australia offered to prepare a draft Code of Hygienic Practice for Dried Milk which would take into account the relevant IDF code for the manufacture of milk powder and the Recommended Codex International Code of Practices - General Principles of Food Hygiene.

The first draft was presented but not examined in detail at the 18th session of the Milk Committee since the Codex Committee for Food Hygiene was revising the General Principles of Food Hygiene. It was agreed that the text would be revised to incorporate the necessary provisions of the new General Principles.

This revised version plus an annex containing draft microbiological specifications for dried milk products was examined at the 19th session of "The Milk Committee" and after some amendments it was agreed to refer the Code for further development to the Codex Committee on Food Hygiene. The Code was examined in detail and amended at the 16th session of the above Committee, but it was agreed to make no changes in the annex until this had been considered by the present working group.

3.2 Definition of Dried Milk Products

The subgroup defined Dried Milk Products as skim milk powder, buttermilk powder and fat powders including instantised powders.

It was further recognized that products intended for use by high risk populations such as infants, children, invalids and geriatrics are not included.

3.3 Definition of a Lot

The subgroup formulated the following definition of a Lot, based on the definition given in ALINORM 79/13A, Appendix V and taking into account the requirements of both the authority responsible for the application of microbiological end product specifications and the complexity of manufacturing and packaging procedures for dried milk products. The following definition is aimed to meet requirements for dried milk products. "A lot is a quantity of food manufactured under essentially identical conditions, all packages of which should bear a marking that will allow the identification of the source(s) of raw material(s), conditions of manufacture and day of final packing".

3.4 Microorganisms of Concern and/or their Toxins

Following the General Principles for the establishment and application of Microbiological Criteria for Foods, Definitions of Microbiological Criteria for Foods (Annex II, FAO/WHO Working Group on Microbiological Criteria for Foods, Geneva, 20-26 February 1979) the subgroup considered

microorganisms of concern and/or their toxins.

The consensus opinion reached was that the microorganisms of concern which should, therefore, be included in microbiological criteria for dried milk products as microbiological end product specifications were mesophilic aerobic bacteria, coliform bacteria and bacteria of the genus Salmonella.

Mesophilic Aerobic Bacteria

This group was included as a general indicator of the hygienic status of dried milk products, the levels being influenced by the microbiological status of the raw milk used with respect to levels of thermoduric (pasteurization resistant) microorganisms, the heat treatment applied in the evaporation and drying process, the hygienic status of the plant and the correct application of process control parameters. There was some discussion concerning the possibility of recommending microbiological criteria for the hygienic quality of raw milk used, but the consensus view was that this is outside the scope of End Product Specifications for dried milk products.

Coliform Bacteria

Coliform bacteria are an indicator of the hygiene of dried milk products and reflect either contamination after heat treatment or, on rare occasions, failure to heat treat adequately. Tests for coliform bacteria are not a reliable index for the presence of salmonellae; there are instances when coliforms have not been detected in milk powder but when salmonellae were detected, and there also is substantial evidence of coliform detection in powders negative for salmonellae.

Bacteria of the Genus Salmonella

Salmonella spp, in dried milk products are of public health significance. Food intoxication and infection outbreaks reported, and incidents of dried milk powder contamination, are not infrequent on a world basis.

Other Microorganisms

The subgroup considered the relevance of enterotoxigenic Staphylococcus aureus for end product specifications but considered that, while these microorganisms served as an indicator of process and product handling hygiene, their presence in low numbers in dried milk products as post- drying contaminants is not directly hazardous to health. As coliform bacteria were proposed as an indicator of hygienic status, it was considered that the inclusion of Staphylococcus aureus is not necessary.

The Group recognized, however, the health risk in dried milk products that can result from the production of heat stable staphylococcal enterotoxins (especially because of the toxins' heat stability) when the microorganism is able to multiply to high levels (10^6/ml or more) in intermediate liquid stages of manufacture. It was also noted that inability to detect viable cells of Staphylococcus aureus in dried milk products is not an assurance that the process was under control with respect to the microorganism.

In the absence of suitable test procedures which can be applied routinely to the detection of staphylococcal enterotoxins in dried milk products, no criterion for these toxins was recommended. A suitable note is inserted under Microbiological Guidelines to advise of risk in this area.

The group also considered the inclusion of criteria for Bacillus cereus and Clostridium perfringens but concluded that, while these bacteria might be a problem in the dried milk products of some developing countries there was not sufficient evidence available to recommend their inclusion in criteria. It was recommended, however, that some research be initiated to clarify the significance of these microorganisms in dried milk products.

The possibility of the inclusion of mycotoxins as a relevant criterion was raised: it was concluded that, while aflatoxin was increasingly recognized as a potential problem in dried milk products, routine testing for mycotoxins was not recommended at this time.

The group thought that the presence of antibiotics in milk powder products derived primarily from the treatment of mastitis was of significance, but concluded that this parameter falls outside the scope of the General Principles definition of criteria.

3.5 Sampling Plans and Microbiological Limits

The Working Group recommended the following sampling plans and microbiological limits for inclusion as microbiological end product specifications for dried milk products.

Mesophilic Aerobic Bacteria

When examined by the prescribed method, mesophilic aerobic bacteria should not be recovered from any of the five samples tested in a number exceeding 200,000 per gramme and from more than two of five samples tested in a number exceeding 50,000 per gramme. (Three class sample plan n=5, c=2, m=50,000, M=200,000).

Coliform Bacteria

When examined by the prescribed method, coliform bacteria should not be recovered from any of the five samples tested in a number exceeding 100 per gramme or from more than one of the five samples tested in a number exceeding 10 per gramme. (Three class sample plan n=5, c=1, m=10, M=100).

Salmonellae

Salmonella spp. should not be recovered from 375 grammes of product taken from each Lot under examination. The samples to be taken should consist of 375 grammes of product in total, made up of 15 subsamples of 25 g each. The subsamples may be composited as is convenient to the analysts. (This is a 2 class sampling plan n=15, c=0, M=0).

This does not preclude the taking of more than 15 samples at the time of packing if automatic samplers are used, which may tend to increase the sensitivity of the sampling plan.

Sampling Methods

Samples should be taken to be representative of the whole Lot of product under examination in numbers prescribed by appropriate sampling plans.

Samples should be taken with due regard for aseptic precautions and comprise sufficient product to allow prescribed analyses to be carried out.

Samples should be kept under cool and dry conditions prior to analysis.

Reference Methods

Mesophilic aerobic bacteria	ISO 4833
Coliform bacteria	ISO 4832 examining 1 g of sample
Salmonella spp.	ISO (DIS 6779)

3.6 Microbiological Guidelines

It was concluded that numerical limits in microbiological guidelines were not appropriate guidelines and should be formulated by the manufacturer taking account of the need to meet limits prescribed in microbiological end product specifications. However, it was recommended that the following form of words should be introduced as microbiological guidelines in the Code of Hygienic Practice for Milk Products.

"The manufacturer should define his own sampling plan for microbiological purposes and establish limits that will ensure that limits in microbiological end product specifications will be, as a minimum, achieved and preferably bettered.

Special consideration should be given to monitoring the establishment samples for Salmonella spp. and susceptible intermediate process stages for the build-up of Staphylococcus aureus. The latter may be done either by monitoring for Staphylococcus aureus or possibly for thermonuclease."

DRAFT CODE OF HYGIENIC PRACTICE FOR PROCESSING OF FROGLEGS

(Retained at Step 3)

The hygiene requirements of this Code are partially based on the revised Recommended International Code of Practice - General Principles of Food Hygiene (ALINORM 78/13A, Appendix V) and the Recommended International Code of Practice for Fresh Fish (CAC/RCP 9-1976). Where inserted in this Code the subsections are indicated in the right hand margin (GP -- General Principles; FF - Fresh Fish).

SECTION I - SCOPE

This code of hygienic practice applies to froglegs derived from edible frogs. It contains the minimum requirements of hygiene in the production, processing, handling, packing, storage, transportation and distribution of froglegs to ensure a healthful and wholesome supply of this product.

SECTION II - DEFINITIONS

2. For the purposes of this Code the following expressions have the meaning stated:

2.1 "Chilling" means the process of cooling to a temperature approaching that of melting ice. FF 2.4

2.2 "Contamination" means the occurrence of any objectionable matter in the product. GP 2.3

2.3 "Disinfection" means the reduction, without adversely affecting the food, by means of hygienically satisfactory chemical agents and/or physical methods, of the number of microorganisms to a level that will not lead to harmful contamination of food. GP 2.4

2.4 "Establishment" means any building(s) or area(s) in which food is handled after harvesting and the surroundings under the control of the same management. GP 2.5

2.5 "Fresh Froglegs" means the skinless hind legs of freshly killed frogs.

SECTION III - HYGIENE REQUIREMENTS IN PRODUCTING/HARVESTING AREA

3.1 Environmental Hygiene in Areas from which Froglegs are Obtained

3.1.1 Protection from contamination by wastes. Frogs should be protected in so far as practicable from contamination with human, animal, domestic, industrial and agricultural wastes and adequate precautions should be taken to ensure that these wastes are not used or disposed of in a manner which may constitute a health hazard through the food. GP 3.1.2

3.1.2 Pest and disease control. Control measures involving treatment with chemical, physical or biological agents should only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health, particularly those which may arise from residues residues in the food. Such measures should only be carried out in accordance with the recommendations of the official agency having jurisdiction. GP 3.1.4

3.1.3 Harvest areas. The environment where frogs are caught or collected should be protected in so far as practicable against contamination which may constitute a health hazard to the consumer through the product.

3.2 Harvesting and Production

3.2.1 Techniques

3.2.1.1 Methods and procedures associated with harvesting and production should be hygienic and such as not to constitute a potential health hazard or result in contamination of the product. GP 3.2.1

3.2.1.2 To prevent deterioration in the quality of froglegs, it is essential that steps should be taken to prevent the live frogs from:

(i) injury or bruising of the flesh during catching, for example, from use of unsuitable equipment;

(ii) contamination with dirt or any other extraneous matter;

(iii) exposure to unfavourable temperatures;

(iv) rough handling, such as improper stacking of containers.

3.2.1.3 Harvesting should be carried out under conditions of minimal stress, such as proper fill to avoid overloading containers.

3.2.2 Equipment and product containers. Equipment and containers used for harvesting should be so constructed and maintained as not to constitute a hazard to health. Containers which are re-used should be of such material and construction as will permit easy and thorough cleaning. They should be maintained clean and, where necessary, disinfected. Containers used for toxic materials should not subsequently be used for holding foods or food ingredients. GP 3.2.2

3.2.3 Removal of obviously unfit materials. Unfit frogs, for example those less active, that are injured or have blood clots or parasites in the flesh, should be segregated during collection to the fullest extent practicable prior to delivery to the processing plant. Similarly, on arrival, unfit frogs should be removed as soon as possible and segregated for disposal in an appropriate manner. Arrangements for removal and segregation should be approved by the official agency having jurisdiction.

3.2.4 Protection against contamination and damage. Suitable precautions should be taken to protect the frogs from being contaminated by animals, insects, vermin, birds, chemicals or microbiological contaminants or other objectionable substances during handling and storage.

3.3 Storage at the place of production/harvesting. Frogs that are stored alive should be kept alive in a sanitary environment until they are processed. Frogs that die, become weak or appear abnormal in any way should be immediately removed from the live store and discarded.

3.4 Transportation

3.4.1 Conveyances for transporting the harvested frogs from the production area or place of harvest or storage should be adequate for the purpose intended and should be of such material and construction as will permit easy and thorough cleaning. They should be maintained clean and where necessary disinfected.

3.4.2 All handling procedure should be such as will prevent raw materials from being contaminated. Care should be taken to keep the frogs alive, to protect against contamination and to minimize damage and stress. Special equipment - such as refrigeration equipment - should be used if the distances involved so indicate. If ice is used in contact with the product it should be of the quality required in paragraph 4.4.1.2

3.5 Cutting Stations. In butchering and cutting carried out at collection points or cutting centres away from the main processing plant, facilities and operating practices should comply with all applicable requirements contained in sections 4, 5, 6 and 7, particularly 7.4.1 involving slaughter, cutting and de-skinning.

SECTION IV - ESTABLISHMENT: DESIGN AND FACILITIES

4.1 Location. Establishments should be located in areas which are free from objectionable odours, smoke, dust or other contaminants and are not subject to flooding. GP 4.1

4.2 Roadways and Areas used by wheeled traffic serving the establishment which are within its boundaries or in its immediate vicinity should have a hard paved surface suitable for wheeled traffic. There should be adequate drainage and provision should be made to allow for cleaning. GP 4.2

4.3 Buildings and Facilities

4.3.1 Buildings and facilities should be of sound construction and maintained in good repair. GP 4.3.1

4.3.2 Adequate working space should be provided to allow for satisfactory performance of all operations. GP 4.3.2

4.3.3 The design should be such as to permit easy and adequate cleaning and to facilitate proper supervision of food hygiene. GP 4.3.3

4.3.4 The buildings and facilities should be designed to prevent the entrance and harvouring of pests and the entry of environmental contaminants such as smoke, dust, etc. GP 4.3.4

4.3.5 Separation of processes. Buildings and facilities should be designed to provide separation, by partition, location or other effective means, between those operations which may cause cross-contamination. GP 4.3.5

4.3.5.2 Any plant producing food not intended for human consumption should be entirely separate from a plant which is processing froglegs for human consumption. Processing of by-products not intended for human consumption should be conducted in separate buildings or in areas which are physically separated to prevent any possible contamination of froglegs.

4.3.6 Buildings and facilities should be designed to facilitate hygienic operations by means of a regulated flow in the process from the arrival of the raw material at the premises to the finished product without overcrowding of equipment and personnel, and should provide for appropriate temperature conditions for the process and the product. GP 4.3.6

4.3.7 In food handling areas: GP 4.3.7

- Floors, where appropriate, should be of water-proof, non-absorbent, washable non-slip and non-toxic materials, without crevices, and should be easy to clean and disinfect. Where appropriate, floors should slope sufficiently for liquids to drain to trapped outlets.

- Walls, where appropriate, should be of water-proof, non-absorbent, washable and non-toxic materials and should be light coloured. Up to a height appropriate for the operation they should be smooth and without crevices, and should be easy to clean and disinfect. Where appropriate angles between walls and floors and between walls and ceilings should be sealed and coved to facilitate cleaning.

- Ceilings should be so designed, constructed and finished as to prevent the accumulation of dirt and minimize condensation, mould development and flaking, and should be easy to clean.

- Windows and other openings should be so constructed as to avoid accumulation of dirt and those which open should be fitted with screens. Screens should be easily movable for cleaning and kept in good repair. Internal window sills, if present, should be sloped to prevent use as shelves.

- Doors should have smooth, non-absorbent surfaces and, where appropriate, be self-closing and close fitting.

- Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes, should be so situated and constructed as not to cause contamination to food. Chutes should be constructed with inspection and cleaning hatches.

4.3.8 In food handling areas all overhead structures and fittings should be installed in such a manner as to avoid contamination directly or indirectly of food and raw materials by condensation and drip, and should not hamper cleaning operations. They should be insulated where appropriate and be so designed and finished as to prevent the accumulation of dirt and to minimize condensation, mould development and flaking. They should be easy to clean. GP 4.3.8

4.3.9 Living quarters, toilets and areas where animals are kept should be completely separated from and should not open directly on to food handling areas. GP 4.3.9

4.3.10 Where appropriate, establishments should be so designed that access can be controlled. GP 4.3.10

4.3.11 The use of material which cannot be adequately cleaned and disinfected, such as wood, should be avoided unless its use would clearly not be a source of contamination. GP 4.3.11

4.3.12 Adequate facilities should be available to maintain froglegs in a chilled condition, as required.

4.3.13 Refrigeration and freezing equipment should be properly designed and constructed to accomplish rapid freezing and should be of adequate capacity.

4.3.14 Freezer and cold storage facilities should be adequate for the intended production and should be fitted with automatic temperature controlling and recording devices.

4.4 Sanitary Facilities

4.4.1 Water supply

4.4.1.1 An ample supply of potable water under adequate pressure and of suitable temperature should be available with adequate facilities for its storage, where necessary, and distribution, and with adequate protection against contamination and pollution. The standards of potability should not be less than those contained in the latest edition of "International Standards of Drinking Water" (WHO). GP 4.4.1.1

4.4.1.2 Ice should be made from potable water and should be manufactured, handled and stored so as to protect it from contamination. GP 4.4.1.2

4.4.1.3 Steam used in direct contact with food or food contact surfaces should not contain any substances which may be hazardous to health or may contaminate the food. GP 4.4.1.3

4.4.1.4 Non-potable water should be carried in completely separate lines, identifiable preferably by colour, and used for steam production, refrigeration, fire control and other similar purposes not connected with food with no cross-connection with or back-siphonage into the system carrying potable water. GP 4.4.1.4

4.4.2 Effluent and waste disposal. Establishments should have an efficient effluent and waste disposal system which should at all times be maintained in good order and repair. All effluent lines (including sewer systems) should be large enough to carry peak loads and should be so constructed as to avoid contamination of potable water supplies. GP 4.4.2

4.4.3 Changing facilities and toilets. Adequate, suitable and conveniently located changing facilities and toilets should be provided in all establishments. Toilets should be so designed as to ensure hygienic removal of waste handled. These areas should be well lit, ventilated and, where appropriate, heated and should not open directly on to food handling areas. Hand washing facilities with warm or hot and cold water, a suitable hand cleaning disinfectant, and with suitable hygienic means of drying hands, should be provided adjacent to toilets and in such a position that the employee must pass them when returning to the processing area. Where hot and cold water are available mixing taps should be provided. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided near to each washing facility. Taps of a non-hand operable type are desirable. Notices should be posted directing personnel to wash their hands after using the toilet. GP 4.4.3

4.4.4 Hand washing facilities in processing areas. Adequate and conveniently located facilities for hand washing and drying should be provided wherever the process demands. Where appropriate, facilities for hand disinfection should also be provided. Warm or hot and cold water and suitable hand-cleaning preparations should be provided. Where hot and cold water are available mixing taps should be provided. There should be suitable hygienic means of drying hands. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided adjacent to each washing facility. Taps of a non-hand operable type are desirable. The facilities should be furnished with properly trapped waste pipes leading to drains. GP 4.4.4

4.4.5 Disinfection facilities. Where appropriate adequate facilities for cleaning and disinfection of working implements and equipment should be provided. These facilities should be constructed of corrosion resistant materials, capable of being easily cleaned, and should be fitted with suitable means of supplying warm and cold water in sufficient quantities. GP 4.4.5

4.4.6 Lighting. Adequate natural or artificial lighting should be provided throughout the establishment. Where appropriate the lighting should not alter colours and the intensity should not be less than:

540 lux (50 foot candles) at all inspection points
220 lux (20 foot candles) in work rooms
110 lux (10 foot candles) in other areas

GP 4.4.6

Light bulbs and fixtures suspended over food materials in any stage of production should be of a safety type and protected to prevent contamination of food in case of breakage.

4.4.7 Ventilation. Adequate ventilation should be provided to prevent excessive heat, steam condensation and dust and to remove contaminated air. The direction of the air flow should never be from a dirty area to a clean area. Ventilation openings should be provided with a screen or other protecting enclosure of non-corrodible material. Screens should be easily removable for cleaning. GP 4.4.7

4.4.8 Facilities for storage and disposal of waste and inedible material. Facilities should be provided for the storage of waste and inedible material prior to removal from the establishment. These facilities should be designed to prevent access to waste or inedible material by pests and to avoid contamination of food, potable water, equipment, buildings or roadways on the premises. GP 4.4.8

4.5 Equipment and Utensils

4.5.1 Materials. All equipment and utensils used in food handling areas and which may contact food should be made of material which does not transmit toxic substances, odour or taste, is non-absorbent, is resistant to corrosion and is capable of withstanding repeated cleaning and disinfection. Surfaces should be smooth and free from pits and crevices. The use of wood and other materials which cannot be adequately cleaned and disinfected should be avoided except when their use would clearly not be a source of contamination. The use of different materials in such a way that contact corrosion can occur should be avoided. GP 4.5.1

4.5.2 Sanitary design, construction and installation

4.5.2.1 All equipment and utensils should be so designed and constructed as to prevent hygienic hazards and permit easy and thorough cleaning and disinfection and, where practicable, be visible for inspection. Stationary equipment should be installed in such a manner as to permit easy access and thorough cleaning. GP 4.5.2.1

4.5.2.2 Containers for inedible material and waste should be leak-proof, constructed of metal or other suitable impervious material which should be easy to clean or disposable and be able to be closed accurately. Such containers, used on the processing line, should be located below the level at which the froglegs are processed and in such a way that there is no splashback on the processing line.

4.5.3 Equipment identification. Equipment and utensils used for inedible materials should be so identified and should not be used for edible products. GP 4.5.3

SECTION V - ESTABLISHMENT: HYGIENIC REQUIREMENTS

5.1 Maintenance. The buildings, equipment, utensils and all other physical facilities of the establishment, including drains, should be maintained in good repair and in an orderly condition. As far as practicable, rooms should be kept free from steam, vapour and surplus water. GP 5.1

5.2 Cleaning and Disinfection

5.2.1 Cleaning and disinfection should meet the requirements of this code. For further information on cleaning and disinfection procedures see Code of Practice, General Principles of Food Hygiene, Annex I. GP 5.2.1

5.2.2 To prevent contamination of food, all equipment and utensils should be cleaned as frequently as necessary and disinfected whenever circumstances demand. Stock solution such as hypochlorite should be analyzed for available chlorine prior to use. GP 5.2.2

5.2.3 Adequate precautions should be taken to prevent food from being contaminated during cleaning or disinfection of rooms, equipment or utensils by water and detergents or by disinfectants and their solutions. Detergents and disinfectants should be suitable for the purpose intended and should be acceptable to official agency having jurisdiction. Any residues of these agents on a surface which may come in contact with food should be removed by thorough rinsing with potable water before the area or equipment is again used for handling food. GP 5.2.3

5.2.4 Either immediately after cessation of work for the day or at such other times as may be appropriate, floors, including drains, auxiliary structures and walls of food handling areas should be thoroughly cleaned. GP 5.2.4

5.2.5 Changing facilities and toilets should be kept clean at all times. GP 5.2.5

5.2.6 Roadways and yards in the immediate vicinity of and serving the premises should be kept clean. GP 5.2.6

5.3 Hygiene Control Programme. A permanent cleaning and disinfection schedule should be drawn up for each establishment to ensure that all areas are appropriately cleaned and that critical areas, equipment and material are designated for special attention. A single individual who should preferably be a permanent member of the staff of the establishment and whose duties should be independent of production, should be appointed to be responsible for the cleanliness of the establishment. He should have a thorough understanding of the significance of contamination and the hazards involved. All cleaning personnel should be well-trained in cleaning techniques. GP 5.3

5.4 By-products. By-products should be stored in such a manner as to avoid contamination of food. They should be removed from the working areas as often as necessary and at least daily. GP 5.4

5.5 Storage and Disposal of Waste. Waste material should be handled in such a manner as to avoid contamination of food or potable water. Care should be taken to prevent access to waste by pests. Waste should be removed from the food handling and other working areas as often as necessary and at least daily. Immediately after disposal of the waste, receptacles used for storage and any equipment which has come into contact with the waste should be cleaned and disinfected. The waste storage should also be cleaned and disinfected. GP 5.5

5.6 Exclusion of Domestic Animals. Animals that are uncontrolled or that could be a hazard to health should be excluded from establishments.

5.7 Pest Control

5.7.1 There should be an effective and continuous programme for the control of pests. Establishments and surrounding areas should be regularly examined for evidence of infestation. GP 5.7.1

5.7.2 Should pests gain entrance to the establishment, eradication measures should be instituted. Control measures involving treatment with chemical, physical or biological agents should only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health resulting from the use of these agents, including those which may arise from residues retained in the product. Such measures should only be carried out in accordance with the recommendations of the official agency having jurisdiction. GP 5.7.2

5.7.3 Pesticides should only be used if other precautionary measures cannot be used effectively. Before pesticides are applied, care should be taken to safeguard all food, equipment and utensils from contamination. After application, contaminated equipment and utensils should be thoroughly cleaned to remove residues prior to being used again. GP 5.7.3

5.8 Storage of Hazardous Substances

5.8.1 Pesticides or other substances which may represent a hazard to health should be suitably labelled with a warning about their toxicity and use. They should be stored in locked rooms or cabinets used only for that purpose and dispensed and handled only by authorized and properly trained personnel or by persons under strict supervision of trained personnel. Extreme care should be taken to avoid contaminating food. GP 5.8.1

5.8.2 Except when necessary for hygienic or processing purposes, no substance which could contaminate food should be used or stored in food handling areas. GP 5.8.2

5.9 Personal Effects and Clothing. Personal effects and clothing should not be deposited in food handling areas. GP 5.9

SECTION VI - PERSONNEL HYGIENE AND HEALTH REQUIREMENTS

6.1 Hygiene Training. Managers of establishments should arrange for adequate and continuing training of every food handler in hygienic handling of food and in personal hygiene so that they understand the precautions necessary to prevent contamination of food. Instruction should include relevant parts of this Code. GP 6.1

6.2 Medical Examination. Persons who come in contact with food in the course of their work should have a medical examination prior to their employment if the official agency having jurisdiction, acting on medical advice, considers that this is necessary, either because of epidemiological considerations, the nature of the food prepared in a particular establishment or the medical history of the prospective food handler. Medical examination of a food handler should be carried out at other times when clinically or epidemiologically indicated. GP 6.2

6.3 Communicable Diseases. The management should take care to ensure that no person, while known or suspected to be suffering from, or to be a carrier of a disease likely to be transmitted through food, or while afflicted with infected wounds, skin infections, sores or with diarrhoea, is permitted to work in any food handling area in any capacity in which there is any likelihood of such a person directly or indirectly contaminating food with pathogenic microorganisms. Any person so affected should immediately report to the management that he is ill. GP 6.3

6.4 Injuries. Any person who has a cut or wound should not continue to handle food or food contact surfaces until the injury is completely protected by a waterproof covering which is firmly secured, and which is conspicuous in colour. Adequate first-aid facilities should be provided for this purpose. GP 6.4

6.5 Washing of Hands. Every person engaged in a food handling area should wash his hands frequently and thoroughly with a suitable hand cleaning preparation under running warm, potable water while on duty. Hands should always be washed before commencing work, immediately after using the toilet, after handling contaminated material and whenever else necessary. After handling any material which might be capable of transmitting disease, hands should be washed and disinfected immediately. Notices requiring hand-washing should be displayed. There should be adequate supervision to ensure compliance with this requirement. GP 6.5

6.6 Personal Cleanliness. Every person engaged in a food handling area should maintain a high degree of personal cleanliness while on duty, and should at all times while so engaged wear suitable protective clothing including head covering and footwear, all of which articles should be cleanable unless designed to be disposed of and should be maintained in a clean condition consistent with the nature of the work in which the person is engaged. Aprons and similar items should not be washed on the floor. During periods when food is manipulated by hand any jewellery that cannot be adequately disinfected should be removed from the hands. Personnel should not wear any insecure jewellery when engaged in food handling. GP 6.6

6.7 Personal Behaviour. Any behaviour which could result in contamination of food, such as eating, use of tobacco, chewing (e.g. gum, sticks, betel nuts, etc.) or unhygienic practices such as spitting, should be prohibited in food handling areas. GP 6.7

6.8 Gloves. Gloves, if used in the handling of food products, should be maintained in a sound, clean and sanitary condition. The wearing of gloves does not exempt the operator from having thoroughly washed hands. Gloves should be made of an impermeable material except where their usage would be inappropriate or incompatible with the work involved. GP 6.8

6.9 Visitors. Precautions should be taken to prevent visitors in food handling areas from contaminating food. These may include the use of protective clothing. Visitors should observe the provisions recommended in paragraphs 5.9, 6.3, 6.4 and 6.7.

6.10 Supervision. Responsibility for ensuring compliance by all personnel with all requirements of paragraphs 5.9.1 - 5.9.10 inclusive should be specifically allocated to competent supervisory personnel. GP 6.10

SECTION VII - ESTABLISHMENT: HYGIENIC PROCESSING REQUIREMENTS

7.1 Raw Material Requirements

7.1.1 Unfit frogs should not be accepted.

7.1.2 No raw material or ingredient should be accepted by the establishment if known to contain parasites, microorganisms or toxic, decomposed or extraneous substances which will not be reduced to acceptable levels by normal plant procedures of sorting and/or preparation or processing. GP 7.1.1

7.1.3 Raw materials or ingredients should be inspected and sorted prior to being moved into the processing line and where necessary laboratory tests should be made. Only clean sound raw materials or ingredients should be used in further processing. GP 7.1.2

7.1.4 Raw materials and ingredients stored on the premises of the establishment should be maintained under conditions that will prevent spoilage, protect against contamination and minimize damage. Stocks of raw materials and ingredients should be properly rotated. GP 7.1.3

7.1.5 Frogs should be held under conditions of minimum stress.

7.2 Prevention of Cross-Contamination

7.2.1 Effective measures should be taken to prevent contamination of food material by direct or indirect contact with material at an earlier stage of the process. GP 7.2.1

7.2.2 Persons handling raw materials or semi-processed products capable of contaminating the end product should not come into contact with any end product unless and until they discard all protective clothing worn by them during the handling of raw materials or semi-processed products which have come into direct contact with or have been soiled by raw material or semi-processed products and have changed into clean protective clothing. GP 7.2.2

7.2.3 Each employee should be assigned his definite place and duty on the processing line to prevent intermingling or movement of employees from more contaminated to less contaminated areas.

7.2.4 Ice should be supplied along the processing line only by the employees assigned for this purpose, using clean containers and being fully aware of the danger of cross contamination. Any left-over ice should be discarded.

7.2.5 Any containers and utensils used for ice, water, chlorine, salt solutions, or other food contact material or containing froglegs should be kept off the floor. Small, elevated, readily cleanable platforms or stands may be utilized.

7.2.6 All equipment and utensils used in the processing of froglegs should be assigned exclusively for this purpose. Processing of froglegs should be carried out as a separate operation divorced entirely from other food processing operations such as for shrimp, shellfish, or other fish.

7.2.7 If there is a likelihood of contamination, hands should be washed thoroughly between handling products at different stages of processing. GP 7.2.3

7.2.8 All equipment which has been in contact with raw materials or contaminated material should be thoroughly cleaned and disinfected prior to being used for contact with end products. GP 7.2.4

7.3 Use of Water

7.3.1 As a general principle only potable water as defined in the latest edition of "International Standards of Drinking Water" (WHO) should be used in food handling.

7.3.2 Non-potable water may be used with the acceptance of the official agency having jurisdiction for steam production, refrigeration, fire control and other similar purposes not connected with food. However, non-potable water may, with specific acceptance by the official agency having jurisdiction, be used in certain food handling areas provided this does not constitute a hazard to health.

7.3.3 Water recirculated for re-use within an establishment should be treated and maintained in a condition so that no health hazard can result from its use. The treatment process should be kept under constant surveillance. Alternatively, recirculated water which has received no further treatment may be used in conditions where its use would not constitute a health hazard and will not contaminate either the raw material or the end product. Recirculated water should have a separate distribution system which can be readily identified. The acceptance of the official agency having jurisdiction should be required for any treatment process and for the use of recirculated water in any food process. GP 7.3.3

7.3.4 When in-plant chlorination of water is used the residual content of free chlorine should be maintained at no more than the minimum effective level for the use intended. Chlorination systems should not be relied upon to solve all hygienic problems. The indiscriminate use of chlorine cannot compensate for unhygienic conditions in a processing plant. FF 5.1.3.5

7. 4 Processing

7.4.1 Operating Practices - General Considerations

7.4.1.1 Only sound frogs and froglegs of good quality should be accepted for processing.

7.4.1.2 The quantity of frogs or froglegs received for processing should be regulated and scheduled to prevent large accumulations resulting in prolonged holding time prior to processing, which may permit the growth of pathogenic and spoilage micro-organisms. If the frogs are alive prolonged holding time may increase conditions of stress, which may also increase microbial contamination of the meat.

7.4.1.3 Sampling and inspection procedures for evaluation of frogs or froglegs received for processing should not unduly delay the entry of the frogs or froglegs to the processing line.

7.4.1.4 The segregation of unfit food material shall be such that it cannot contaminate food material fit for human consumption. Unsound frogs shall be destroyed with minimal suffering to the animal.

7.4.1.5 Frogs and froglegs should be handled, processed and packaged with care and under conditions which will prevent the possibility of contamination with or the growth of pathogenic and spoilage micro-organisms.

7.4.1.6 Froglegs should at all times be processed rapidly and kept chilled during processing.

7.4.1.7 Any food additives used for dipping or spraying the froglegs should meet the requirements of the official agency having jurisdiction.

7.4.1.8 Methods of preservation and necessary controls should be such as to protect against contamination or development of a public health hazard and against deterioration within the limits of good commercial practice. It is recommended that water chlorinated to a free residual chlorine content of 20-40 parts per million is used to reduce the growth of micro-organisms in the plant.

7.4.1.9 Processing should be supervised by technically competent personnel. GP 7.4.1

7.4.1.10 Rough treatment of containers should be avoided to prevent possibility of contamination of the processed product. GP 7.4.3

7.4.1.11 After each step of the handling operations, cutting, skinning, trimming and grading, the froglegs should be washed by spraying with water in compliance with 7.4.1.8.

7.4.2 Preparatory Operations

7.4.2.1 Washing or other preparation. Frogs should be washed to remove any contamination. Water used for washing and rinsing should comply with the recommendations laid down in section 7.3.

7.4.2.2 The washing of the frogs should be done in running water for at least 24 hours in a clean holding tank, with a false bottom of wire, with a series of outlets at one side of the bottom and a series of water inlets at the upper-side opposite the side of the inlets, to remove soil, faeces and slime.

7.4.3 Slaughter and Butchering

7.4.3.1 Before slaughtering the live frogs should be stunned, so they are relieved from pain during the cutting. This should be done in a humane manner, e.g. by electricity (and not by putting them in a 10% solution of common salt).

7.4.3.2 The killing should be done immediately after stunning in such a manner that either the head is severed from the body or the brain is destroyed by pithing.

7.4.3.3 The hind legs should be removed by extending them fully and then severing them from the body by a cut close to the waist made in such a manner that the intestines are not damaged. Any remaining viscera and the cloaca and surrounding skin should be removed immediately as hygienically as possible.

7.4.4 Bleeding

7.4.4.1 The legs should be washed and bled immediately after cutting. They should be immersed in chilled brine (maximum 4°C) to prevent clotting and allow thorough bleeding.

7.4.4.2 If the legs are to be processed immediately after bleeding, they should be skinned before immersion in the chilled brine.

7.4.4.3 If the legs are not processed immediately after bleeding, the skin should be left on to reduce the possibility of contamination of the flesh.

7.4.5 Skinning and Trimming

7.4.5.1 The removal of the skin and clipping of the feet should be carried out on a clean board over which a continuous supply of water (in compliance with 7.4.1.8) runs.

7.4.5.2 After skinning and clipping, the legs should be trimmed by removing remnants of membrane and hanging pieces of flesh. During this operation, the dressed material should be carefully examined for parasites, bruises, blood spots and other defects.

7.4.5.3 The skinned and trimmed legs should be washed thoroughly in several changes of water at 4°C. This water should be chlorinated as in section 7.4.1.8.

7.4.6 Grading

7.4.6.1 Size grading should be done before packing and freezing.

7.4.7 Holding and transporting for further processing

7.4.7.1 Froglegs which are not processed immediately should be cooled to at least 4°C as soon as possible and held in this condition until the next processing stage. Cooling (chilling) should be done in a blast chiller or other appropriate equipment. Chill store rooms should not be used to cool the froglegs but only to maintain them chilled after cooling.

7.4.7.2 Froglegs should not be held chilled for longer than necessary but should proceed as soon as possible to packaging and freezing. It is not advisable to transport froglegs, even though chilled, to another plant for further processing.

7.5 Packaging

7.5.1 All packaging material should be stored in a clean and hygienic manner. The material should be appropriate to the product to be packed and to the expected conditions of storage and should not transmit to the product substances unacceptable to the official agency having jurisdiction. The packaging material should be sound, new and should provide appropriate protection from contamination. GP 7.5.1

7.5.2 Product containers should not have been used for any purpose which may lead to contamination of the product. Where practicable containers should be inspected immediately before use to ensure that they are in a satisfactory condition and, where necessary, cleaned and disinfected; when washed they should be well drained before filling. Only packaging material required for immediate use should be kept in the packing or filling area. GP 7.5.2

7.5.3 Packing should be done under conditions that preclude contamination of the product. The legs should either be wrapped hygienically, individually in polyethylene film or preferably inserted into small polyethylene bags.

7.6 Freezing. The legs should be frozen in the minimum possible time. Bruised, squeezed or broken legs should not be used for freezing. After freezing, the material should be transferred into cold storage, the temperature of which should not be higher than -18°C.

7.7 Storage and Transport of the end product

7.7.1 The end product should be stored and transported under such conditions as will preclude the contamination with and/or proliferation of microorganisms and protect against deterioration of the product or damage to the container. During storage, periodic inspection of the end product should take place to ensure that only food which is fit for human consumption is despatched and that end product specifications should be complied with when they exist. The product should be despatched in the sequence of the lot numbers. GP 7.6

7.7.2 Doors should not be left open for extended periods and should be closed immediately after use.

7.7.3 No chilling room and cold storage should be loaded beyond its designed capacity.

7.7.4 Where recording thermometers are not used, temperature should be read at regular intervals and the readings recorded in a log book.

7.7.5 Frozen froglegs should be stored at a sufficiently low temperature if a considerable quality loss is to be avoided. Freezer stores should be able to operate at -18°C. Thermometers, or other temperature recording devices, should be capable of being read easily within a two-degree accuracy. More detailed requirements for the construction and operation of a freezer store are given in the "Code of Practice for Frozen Fish".

7.8 Laboratory Control Procedures. In addition to any control by the official agency having jurisdiction, it is desirable that each plant in its own interest should have access to laboratory control of the sanitary quality of the product processed. Such control should reject all products that are unfit for human consumption. Laboratory procedures used should preferably follow recognized or standard methods in order that the results may be readily interpreted. Where appropriate, representative samples of the production should be taken to assess the safety and wholesomeness of the product. Laboratories checking for pathogenic microorganisms should be well separated from food processing areas.

SECTION VIII - END PRODUCT SPECIFICATIONS

8. Appropriate methods should be used for sampling and examination to determine the compliance with the following specifications:

8.1 Froglegs should, to the extent possible in good manufacturing practice, be free from objectionable matter and parasites.

8.2 Froglegs should be free from microorganisms in amounts harmful to man, free from parasites harmful to man and should not contain any substances originating from microorganisms in amounts which may represent a hazard to health.

8.3 Froglegs should be free from chemical pollutants in amounts which may represent a hazard to health.

8.4 Froglegs should comply with any requirements set forth by the Codex Alimentarius Commission on pesticide residues and food additives as contained in permitted lists of Codex commodity standards, or should comply with the requirements on pesticide residues and food additives of the country in which the froglegs will be sold.

MICROBIOLOGICAL SPECIFICATIONS FOR FOODS FOR INFANTS AND CHILDREN (UP TC THREE YEARS)

The following microbiological specifications are of an advisory nature in accordance with the General Principles for the Establishment and Application of Microbiological Criteria for Foods (Ref.....). They are attached to a code of practice which is also of an advisory nature. The specifications are intended to increase assurance that the provisions of hygienic significance have been met but should not be regarded as mandatory.

Product	Test	Case	Class Plan	n	c	Limit per g m	Limit per g M
a) Dried biscuit type product[1]							
1. plain	none	-	-	-	-	-	-
2. coated	coliform	5	3	5	2	<3[2]	20
	Salmonella[3][9]	11	2	10	0	0	-
b) Dried and instant products[4][5]	mesophilic aerobic bacteria[6]	6	3	5	2	10^3	10^4
	coliform	6	3	5	1	<3[2]	20
	Salmonella[9]	12	2	60	0	0	-
c) Dried products requiring heating before consumption[5][7]	mesophilic aerobic bacteria	4	3	5	3	10^4	10^5
	coliform	4	3	5	2	10	100
	Salmonella[9]	10	2	5	0	0	-
d) Thermally processed products packaged in hermetically sealed containers[8]	These products: a) shall be free of microorganisms capable of growth in the product under normal nonrefrigerated conditions of storage and distribution; and b) shall not contain any substances originating from microorganisms in amounts which may represent a hazard to health; and c) if they have a pH above 4.6 shall have received a processing treatment which renders the products free of viable forms of microorganisms having public health significance.						

See Notes on following page.

Notes relating to Table on Page 81 - Microbiological Specifications for Foods for Infants and Children

(Up to three years)

1) Dry shelf-stable products
2) <3 means no positive tube in the standard-3-tube MPN method
3) Applies only to products containing one or more Salmonella sensitive ingredients, e.g. chocolate coatings
4) Products intended for consumption after addition of liquid; includes dried infant formulas, instant infant cereals, etc.; microbial limits apply to dry product
5) Includes supplementary products, e.g. sweetening agents, starches, texturizers and similar products, singly or in combination
6) Not applicable to products which are produced by a microbial fermentation process
7) Products intended for consumption after addition of liquid and which are specified to be heated to boiling before consumption; microbial limits apply to dry product
8) Includes aseptically canned products and liquid infant formulas; assumes these products are manufactured in accordance with the respective Codes of Good Manufacturing Practice
9) For the examination of such foods for the presence of Salmonella, 25 g samples shall be used and these may be pooled.

METHODS FOR MICROBIOLOGICAL ANALYSIS FOR FOODS FOR INFANTS AND CHILDREN (UP TO THREE YEARS)

Mesophilic aerobic bacteria

Draft International Standard ISO/DIS 4833
Refer to ICMSF (1974) chapter 7, page 83-91 for collection and preparation of samples for analysis; in all instances 25 g shall constitute a sample unit (analytical unit); incubation of agar plates shall be at 30°C.

Coliform count

Draft International Standard ISO/DIS 4831
Collection and preparation of samples, sample unit and incubation as in viable colony count above.

Salmonellae

According to the "Report of the 13th Session of the Codex Alimentarius Committee on Food Hygiene, Rome, 10 - 13 May, 1976, Appendix VI, para 9".
Collection and preparation of samples, sample unit and incubation as in viable colony count above.

Labour and cost of testing may be reduced by testing pooled sample units (analytical units). Studies have shown[1)] that salmonellae may be detected with equal accuracy, and that there is no significant difference in sensitivity when testing a large sample versus multiple subsamples. Therefore, 25 g sample units may be composited to a quantity not to exceed 400 g. Analysis may then proceed as for a 25 g unit with appropriate change in equipment, media volume, etc.

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1) American Public Health Association, 1976. Compendium of Methods for the Microbiological Examination of Foods, M. L. Speck (ed), chapter 25, page 313. American Health Association, 1015 18th St., N.W. Washington D.C. 20036