codex alimentarius commission

FOOD AND AGRICULTURE
ORGANIZATION
OF THE UNITED NATIONS

WORLD HEALTH
ORGANIZATION

JOINT OFFICE: Via delle Terme di Caracalla 00100 ROME Tel.: 57971 Telex: 625852-625853 FAO I Cables: Foodagri Rome Facsimile: (6) 57973152-5782610

ALINORM 93/13

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX ALIMENTARIUS COMMISSION
Twentieth Session
Geneva 28 June - 7 July 1993

REPORT OF THE TWENTY-FIFTH SESSION OF THE
CODEX COMMITTEE ON FOOD HYGIENE
Washington D.C., 28 October - 1 November 1991

Note: This document incorporates Codex Circular Letter 1993/27-FH

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CX 4/20.2

CL 1991/27-FH
November 1991

TO: - Codex Contact Points
- Participants at the 25th Session of the Codex Committee on Food Hygiene
- Interested International Organizations

FROM: Chief, Joint FAO/WHO Food Standards Programme
FAO, 00100 Rome, Italy

SUBJECT: Distribution of the Report of the 25th Session of the Committee on Food Hygiene (alinorm 93/13)

A. MATTERS FOR ADOPTION BY THE 20TH SESSION OF THE CODEX ALIMENTARIUS COMMISSION

Draft Codes and Guidelines at step 8 of the Procedure

1. Draft General Provisions Relating to Hygiene in Codex Standards (ALINORM 93/13, para. 17, App. II)

2. Draft Code of Hygienic Practice for Pre-Cooked and Cooked Foods in Mass Catering (ALINORM 93/13, para. 25, App. III)

3. Draft Guidelines Procedures for the Visual Inspection of Lots of Canned Foods (ALINORM 93/13, para. 48, App. IV). The Guidelines were advanced to Step 5 and in view of the detailed revision they had gone through, the Committee recommended that the Commission consider omitting Steps 6 and 7 and adopting the document at Step 8.

Governments wishing to propose amendments and comments on the above documents should do so in writing in conformity with the Guide to the Consideration of Standards at Step 8 (see Procedural Manual of the Codex Alimentarius Commission) to the Chief, Joint FAO/WHO Food Standards Programme, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy before 30 September 1992.

B. DOCUMENTS TO BE ELABORATED FOR GOVERNMENT COMMENTS PRIOR TO THE NEXT MEETING OF THE COMMITTEE

Proposed Draft Code at Step 6 of the Procedure

4. Proposed Draft Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods (ALINORM 93/13, para. 20)

Proposed Draft Codes or Guidelines at Step 3 of the Procedure

5. Draft Code of Hygienic Practice for Uncured/Unripened Cheese and Ripened Soft Cheese (ALINORM 93/13, para. 36)

6. Draft Code of Hygienic Practice for Spices and Condiments (ALINORM 93/13, para. 42)

C. REQUEST FOR COMMENTS AND INFORMATION

Proposed Draft Codes or Guidelines at Step 3 of the Procedure

7. Draft Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf Life (ALINORM 93/13, para. 29, App. V)

8. Draft Principles and Application of the Hazard Analysis Critical Control Point (HACCP) System (ALINORM 93/13, para. 80, App. VI)

Governments and international organizations wishing to submit comments and information on Documents 7. and 8. are invited to do so not later than 31 May 1992 to the Chairman of the Committee at the following address:

Dr. D.L. Archer
Deputy Director
Center for Food Safety and Applied Nutrition (HFF-1)
U.S. Food and Drug Administration
200 C Street, SW
Washington, D.C. 20204

Copies of all comments should be sent to the Chief, Joint FAO/WHO Food Standards Programme, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.

SUMMARY AND CONCLUSIONS

The summary and conclusions of the 25th Session of the Codex Committee on Food Hygiene are as follows:

Matters for Consideration by the Commission:

- Agreed to advance to Step 8 the Draft General Provisions Relating to Hygiene in Codex Standards and recommended that these general provisions should be applied retroactively to all Codex Standards where possible (para. 17, App. II).

- Agreed to advance to Step 8 the Draft Code of Hygienic Practice for Pre-Cooked and Cooked Foods in Mass Catering, for adoption by the Commission at its 20th Session (para. 25, App. III).

- Agreed to advance to Step 5 the Draft Guideline Procedures for the Visual Inspection of Lots of Canned Foods, and recommended that the Commission consider omitting Steps 6 and 7 and adopting the document at Step 8 (para. 48, App. IV).

- Decided that the Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 2 (1985) should be comprehensively revised and agreed that the delegation of the United Kingdom should prepare a draft revision, in cooperation with all interested delegations, to be circulated for comments before the next session of the Committee (para. 65) (Secretariat note: This matter will also be brought to the attention of the 39th Session of the Executive Committee).

- Agreed to circulate for comments at Step 3 the Draft Principles and Application of the Hazard Analysis Critical Control Point (HACCP) System, subject to confirmation by the Executive Committee. The Committee further recommended that these principles should be incorporated into Codex Codes of Practice, that the General Principles of Food Hygiene should be revised accordingly and that a statement to this effect should be included in the Procedural Manual (para. 80, App. VI).

Other Matters of Interest to the Commission:

The Committee:

- Agreed to return to Step 6 the Draft Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods for more comments after revision (para. 20).

- Agreed to return to Step 3 the Draft Code of Hygienic Practice for Uncured/Unripened Cheese and Ripened Soft Cheese. The Committee also agreed to request the Netherlands to prepare a new draft of the Code, and France to prepare a draft annex to the code, specifically for cheeses produced from raw milk, to be circulated for more comments (para. 36).

- Agreed to return to Step 3 the Draft Code of Hygienic Practice for Spices and Condiments, and to have a new draft of the code prepared, to be circulated for further comments (para. 42).

SUMMARY AND CONCLUSIONS (Cont.d)

- Reviewed and agreed to circulate for comments at Step 3 the Draft Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf-Life (para. 29, App. V).

- Agreed that the Pictorial Manual prepared by Canada with the assistance of other delegations would be distributed to Codex Contact Points and participants in the CCFH, following the decision of the 37th Session of the Executive Committee to have this manual prepared outside the Codex Procedures (para. 43).

- Discussed the conclusions of the FAO/IAEA/WHO-IGFI Consultation on Microbiological Criteria for Foods to be Further Processed Including by Irradiation, and recognized the interest and importance of irradiation as a technology devised to ensure food safety. The Committee decided that the Codes of Hygienic Practice should not be revised to incorporate microbiological guidelines, but that these should be considered within the HACCP framework (para. 52).

- Agreed not to amend the present provisions of the General Principles of Food Hygiene regarding pre-employment and routine medical examination of food handlers, as they allowed for differences in national legislations, while endorsing the view of WHO and most governments that such examination was not useful in itself to ensure the prevention of food-borne diseases (para. 56).

- Agreed that a general model Code of Hygienic Practice for street-vended foods should be prepared, taking into account the General Principles of Food Hygiene and including explanations of its provisions. The Committee stressed that this work should be carried out urgently and asked that a first draft should be available to the 8th Session of CCASIA in January 1992. This draft code should then be reviewed by the relevant Coordinating Committees and by CCFH at is next session (paras 68-71).

- Discussed the Summary of Recommendations on Listeria monocytogenes prepared by the Secretariat and agreed that application of the HACCP system and revision of the General Principles of Food Hygiene would improve the control strategies for Listeria and other food-borne diseases. The Committee agreed to continue collecting information on epidemiology, methodology of detection and means of control, as well as the use of quantitative tolerances, noting that this last aspect remained controversial (para. 73-76).

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INTRODUCTION

1. The Codex Committee on Food Hygiene held its Twenty-Fifth Session in Washington, D.C., from 28 October to 1 November 1991 at the kind invitation of the Government of the United States of America. The Session was chaired by Dr. Douglas Archer, Deputy Director of the Center for Food Safety and Applied Nutrition, United States Food and Drug Administration. It was attended by 71 delegates representing 27 Member Countries of the Codex Alimentarius Commission and 9 observers from 5 international organizations.

2. A list of participants, including the officers of the Secretariat, is attached to the report of the Session as Appendix I.

OPENING OF THE SESSION (Agenda Item 1)

3. At the invitation of the Chairman of the Session, Dr. Alejandro Thiermann, U.S. Coordinator for Codex Alimentarius, addressed the Committee. Dr. Thiermann referred to the importance which the United States attached to the work of the Committee on Food Hygiene, especially in the context of the proposed GATT decision in relation to Sanitary and Phytosanitary Measures and Barriers applied to food moving in international trade. He indicated that the elements of food safety contained in the Codes of Practice elaborated by the Committee would be the basis for trade in safe and wholesome foods to supply the world's population. Most importantly, Dr. Thiermann noted, the Codex Alimentarius Commission provided the forum for industry, consumers and food regulators to come together to discuss food safety problems and to arrive at conclusions, based on scientific evaluations, which would be acceptable to all.

4. Dr. Thiermann introduced Dr. Mitchell Cohen, Director, Division of Bacterial Diseases, National Center for Infections Diseases (USA), who addressed the Committee on the topic of "Epidemiology of Cholera in the Americas."

ADOPTION OF THE AGENDA (Agenda Item 2)

5. Prior to the adoption of the agenda, the Chairman referred to the Joint FAO/WHO International Conference on Food Standards, Chemicals in Food and Food Trade of March 1991 which had recommended that WHO, FAO and the Codex Alimentarius Commission give priority attention to the microbiological contamination of foods. He noted that, during its 19th session in July 1991, the Codex Alimentarius Commission had considered this recommendation of the March Conference and had referred it to the Codex Committee on Food Hygiene for action. He also referred to the resolution passed in May 1989 by the 42nd Health Assembly, on the Prevention and Control of Salmonellosis (WHA 42.40) in which the WHO Director General was requested "to continue to assist Member States, in particular through the work of the Codex Alimentarius Commission, in the development of optimum microbiological and hygienic standards for products of animal origin."

6. The Chairman felt that the Committee had the obligation to examine, and focus on its mandate as reflected in the Scope of the General Principles of Food Hygiene (Section 1.1). He noted that the Committee's Terms of Reference were under consideration by the Codex Committee on General Principles. To this end, the Chairman proposed the adjustment of the agenda and to consider Agenda Item 14 (Prevention and Control of Salmonellosis and Similar Food Borne Diseases, document CX/FH 91/12) on Tuesday at 2 p.m. since this paper underscored the need of the Committee to reconsider the terms of reference. In addition he proposed that consideration be given to a full revision of the Codex Alimentarius Code of Practice on the General Principles of Food Hygiene to bring it in line with contemporary concepts of food safety. In particular, this document needed to refer to the Hazard Analysis Critical Control Point system and other quality assurance systems (such as ISO 9 000) which could be applied to all parts of the food chain where contamination might occur.

7. The Committee adopted the Provisional Agenda as contained in CX/FH, 91/1 as the agenda for the session with the changes proposed and with slight modifications of the order in which items would be discussed.

MATTERS OF INTEREST ARISING FROM THE CODEX ALIMENTARIUS COMMISSION (19th SESSION) AND OTHER CODEX COMMITTEES (Agenda Item 3)

8. The Committee had before it document CX/FH 91/2, which contained a summary of matters arising from the 19th Session of the Codex Alimentarius Commission (July 1991), and from the Codex Committee on Fish and Fishery Products. The Committee noted that the texts which it had advanced to Step 8 of the Procedure at its previous session had been adopted by the Commission. It also noted the decisions of the Commission to stress the importance of improving relations with consumers; the need to take a horizontal approach to food standardization; and the implications of biotechnology on the work of Codex. The Committee noted with interest the Commission's endorsement of the recommendation arising from the FAO/WHO Conference on Food Standards, Chemicals in Food and Food Trade that microbiological contamination of food required priority attention, especially through the work of the Codex Committee on Food Hygiene.

ACTIVITIES OF INTEREST TO THE COMMITTEE WITHIN FAO, WHO AND OTHER INTERNATIONAL ORGANIZATIONS (Agenda Item 4)

9. The Committee had for its information Document CX/FH 91/3, prepared by the Secretariat, containing information from FAO and WHO on the Joint activities of the organizations and on selected matters of interest arising from their individual activities. The Committee particularly noted the outcome of the FAO/WHO Conference on Food Standards, Chemicals in Food and Food Trade, and the Joint FAO/WHO Consultation on Assessment of Biotechnology in Food Production and Processing as related to Food Safety. It also noted the work of FAO in food control assistance, street foods, mycotoxins, import/export control, and on the control of cholera through street foods in Latin America and the Caribbean - this being undertaken in cooperation with PAHO. WHO activities of particular interest to the Committee included the Global Task Force on Cholera. The Committee also noted the extensive publications available from both FAO and WHO on food control and food safety.

PAN AMERICAN HEALTH ORGANIZATION (PAHO)

10. The Observer from PAHO outlined activities of his organization related to the work of the Codex Committee on Food Hygiene. He gave an evaluation of the regional program of technical cooperation carried out during the years 1986-1990, which focused on updating regulations, establishing information systems, stimulating surveillance, and improving consumer education and participation.

11. The Observer highlighted the activities carried out or initiated in 1990 and 1991, with a general objective of improvement in the following areas:

- preventing risks of transmission of cholera through foods, in cooperation with FAO, FDA, CDC and the USAID;
- epidemiological surveillance of foodborne diseases;
- street vended foods, especially in cooperation with FAO;
- paralytic shellfish poisoning (red tide);
- mycotoxins (FAO/PAHO workshop held in Costa Rica in February, 1991)
- analysis of residues of anabolic agents in meat;
- technical cooperation with Mexico and the Caribbean countries;
- development and utilization of computerized information systems;
- interinstitutional and intersectional cooperation of all agencies involved in food protection within individual countries.

12. The Observer drew attention to the creation of a Pan American Institute for Food Protection and Zoonoses (INPPAZ) to be located in Buenos Aires with the support of the government of Argentina, replacing the Pan American Zoonoses Center (CEPANZO).

13. In addition, the Observer indicated that future activities would focus on the organization of national integrated programs for food protection; strengthening of laboratory and inspection services, establishing epidemiological surveillance systems for foodborne disease and promoting food protection by community participation.

International Dairy Federation (IDF)

14. The Observer from IDF brought to the attention of the committee this organization's work with regard to hygiene of dairy products, especially bacteriology and quality of milk, codes of hygienic practice for various dairy products, hygiene requirements at all stages of dairy production, microbiological sampling and analysis.

International Organization for Standardization (ISO)

15. On behalf of the ISO, the French delegation indicated that since the 24th session of CCFH, this organization has published seven standards relating to microbiological sampling and analysis.

DRAFT GENERAL PROVISIONS RELATING TO HYGIENE IN CODEX STANDARDS (Agenda Item 5)

16. The Committee had for its consideration the Draft General Provisions as contained in Appendix II of ALINORM 91/13, and government comments received from Canada and Thailand in response to Codex Circular Letters 1989/49-FH and 1991/9-FH, in document CX/FH 91/4. The Committee noted that the Draft General Provisions had been prepared with a view to providing a restricted number of common provisions which could be selected as appropriate by Codex Commodity Committees for incorporation into Codex Standards, thus simplifying the endorsement procedure, and emphasizing the "horizontal" approach to food standardization.

Status of the Draft General Provisions relating to Food Hygiene

17. Noting the positive nature of the comments received, the Committee agreed to advance the Draft General Provisions to Step 8 of the Procedure, and recommended that they be applied retroactively to existing standards where possible. The Draft General Provisions are attached to the present report as Appendix II.

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR ASEPTICALLY PROCESSED AND PACKAGED LOW-ACID FOODS (Agenda Item 6)

18. The Committee had for its consideration working paper ALINORM 91/13-Appendix VIII containing the Draft Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods, presented by the delegation of the United States at the 23rd session of CCFH and advanced at step 5 at the 24th session of CCFH. The comments of governments at Step 6 in response to CL 1989/49-FH were presented in documents CX/FH 91/5 (France, Thailand, United States) and CX/FH 91/5-Add. 1 (Canada).

19. The delegation of the United States reported to the Committee on the work of the drafting group which had met during the present session. It was agreed that acidified food would be dealt with by reference to the Appendix on acidified canned foods in the low Acid Canned Food Code. The drafting group had suggested that the Foreword to the Code should recommend the use of a HACCP plan and should stress the importance of proper acidification of acidified canned foods, that investigations should be carried out as to the level of sensitivity in temperature measurement, as well as to incorporate selected Codex and other references regarding methods of analysis, sampling and defects inspection of containers. The delegation of Canada remarked that this code should also be so structured as to take into account current and future evolutions in food technology. It was further agreed that there would be no need to elaborate provisions or codes for acid foods.

Status of the Draft Code of Hygienic Practice of Aseptically Processed and Packaged Low-Acid Foods

20. In view of the diversity of technical points still under consideration and the need for more data, the Committee agreed to request the United States delegation to revise this Code. It agreed to return the Code to Step 6 of the Codex Procedure, to be circulated separately for government comments.

DRAFT CODE OF HYGIENIC PRACTICE FOR PRE-COOKED AND COOKED FOODS IN MASS CATERING (Agenda Item 7)

21. For its discussion on this item, the Committee had before it the Draft Code as contained in Appendix VII of ALINORM 91/13, which had been advanced to Step 6 of the Procedure by the 19th Session of the Commission (July 1991). It also had Government comments received in response to Codex Circular Letters 1989/49-FH and 1991/9-FH from France, Thailand and the United States in document CX/FH 91/6, and from Malaysia in Conference Room Document No.3.

22. The Committee discussed proposals to extend the Scope of the Code to include raw foods used in mass catering, whether individually or as part of a meal. Several delegations were of the opinion that this was needed in order to cover known problems experienced with organisms such as Listeria monocytogenes. The Committee, however, recognized that the present Code was in an advanced stage of elaboration and that the inclusion of raw foods would require substantial changes which would delay the adoption of the Code by the Commission. It was agreed to maintain the restricted Scope of the Code, as indicated in the Title, to pre-cooked and cooked foods, and to discuss at a later stage whether a separate code should be prepared to cover raw foods with a view to integrating the two codes at a later date.

23. The Delegation of the United Kingdom noted that the Code contained provisions which were specific to the cook/chill or cook/freeze processes and which were not applicable to foods cooked and then served immediately. It was agreed to indicate which of the provisions of the code were specific to the cook/chill or cook/freeze processes in a separate statement in the Scope together with amendments to Section IV B.

24. The Committee agreed that the comments received from governments on the Code, except those relating to the inclusion of raw foods, were acceptable and amended the Code accordingly.

Status of the Draft Code of Hygienic Practice for Pre-cooked and Cooked Foods in Mass Catering

25. The Committee agreed to advance the Draft Code of Practice to Step 8 of the Procedure for adoption by the Commission. The revised Draft Code is attached to the present report as Appendix III.

PROPOSAL FOR A DRAFT CODE OF HYGIENIC PRACTICE FOR REFRIGERATED PACKAGED FOODS WITH EXTENDED SHELF LIFE (Agenda Item 8)

26. The Committee recalled that it had, at its 24th Session, agreed to undertake the elaboration of a Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf Life in view of the important technological developments and the growth of the refrigerated packaged food industry and trade. The Delegation of France had been requested to prepare the initial draft of such a code. The Delegation of France introduced Document CX/FH 91/14, containing the text of the proposed draft code of Hygienic Practice, and CX/FH 91/14-Add.1 containing a correction to the text as proposed by Canada.

27. Although noting that the elaboration of the code had first been discussed within the context of an earlier discussion on the Proposed Draft Code of Hygienic Practice for Pre-cooked and Cooked Foods used in Mass Catering, the Committee agreed that the Code should apply to foods intended for direct sale to the consumer or through other channels, and that it should not be restricted to foods used in mass catering.

28. The Committee agreed that the Scope of the code should be limited to foods which were sold in hermetically sealed containers, and which had been subjected to a treatment sufficient to achieve a declared shelf-life of greater than 5 days under refrigerated conditions. It was recognized that some foods already covered in other Codex Codes or by virtue of their specific properties would be excluded from the Scope of the Code.

Status of the Proposed Draft Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf Life

29. The Committee agreed that the Proposed Draft Code should be amended to reflect its discussion concerning its Scope, and advanced it to Step 3 for Government Comments. The text of the Proposed Draft Code is attached to the present report as Appendix V.

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR THE MANUFACTURE OF UNCURED/UNRIPENED AND RIPENED SOFT CHEESES (Agenda Item 9)

30. In discussing the proposed Code, introduced by IDF, the Committee had before it working paper CX/FH 91/7 presenting the Draft Code of Hygienic Practice for the Manufacture of Uncured/Unripened and Ripened Soft Cheeses, prepared by IDF and incorporating the comments made at the 22nd Session of the Milk Committee, as well as the annex to the code designated as "Outline for Hygienic Processing of Ripened Soft Cheeses made from Raw and Pasteurized Milk" and circulated as Conference Room Document 1. Government comments at step 3 in response to CL 1991/9-FH were incorporated in document CX/FH 91/7-Add.1 (Canada, France) and Conference Room Document 1. (Thailand)

31. The delegations of Canada and USA indicated that production of cheese from raw milk was not allowed under their national legislations, according to which pasteurization of milk only would ensure the safety of the final product. The observer from the EEC informed the Committee that a Proposal for a Council Regulation defined the hygienic conditions of milk production and production of cheese from raw milk. In view of the different approaches to the use of raw milk, it was agreed that the criteria relating to production of cheese from raw milk would be dealt with in a separate annex. The observer from IDF emphasized the general aspects of the document, establishing hygienic requirements for cheese production, whether from pasteurized or raw milk. The Committee agreed to continue the examination of the main body of the document.

32. After a discussion as to the status to be given to the provisions regarding cheeses made from raw milk, the Committee agreed to request France to elaborate a draft annex to the Code, with the cooperation of other producing countries or interested delegations. It was suggested that the delegations with an experience in this field could supply information to the Committee as to the risk assessment and monitoring programs they applied to ensure the safety of cheeses produced from raw and lightly heat treated milk.

33. After an exchange of views on the criteria used for pasteurization, the Committee decided not to alter the current definition of pasteurization, which had been approved by CCFH at its 23rd session and by the Milk Committee, but to add a definition of mild forms of heat treatment such as "thermization". It agreed, however, that these definitions should be subject to government comment and therefore decided that they should be included in square brackets.

34. In relation to the definition of end products, as referred to in section IX of the Draft Code, the question was raised as to the exact stage at which microbiological criteria were intended to be used. It was noted that the present definition related to cheese in its final stage of production and processing as distinct from product in the processing chain, but did not apply to the point of sale; specifications were given as an indication that hygienic practices had been followed during production and processing but were not intended for control purposes at a later stage.

35. However, in the light of the questions raised, it was suggested that the scope of the Draft Code might be widened to include the stages following processing up to and including the retail point, as well as milk production on the farm, which appeared especially critical with regard to the safety of raw milk and cheese produced therefrom. It was admitted that at this stage of the discussion, a conclusion could not yet be reached and that the definition of end products would be circulated for comments.

36. In view of the complexity of written and oral comments and the new issues raised, and in consideration of the limited time allowed for review by Codex delegations, the Committee agreed to return the Draft Code to step 3 of the Codex Procedure and to request the delegation of the Netherlands to prepare a new draft of the Code, in cooperation with other delegations which would express their interest, as well as France for the provisions relating to cheese made with raw milk. It was agreed the revised Draft Code and the Annex would be circulated for comments by governments at step 3 of the Codex Procedure.

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR SPICES AND CONDIMENTS (Agenda Item 10)

37. The Committee had for its consideration working paper ALINORM 91/13 Appendix XI containing the Draft Code of Hygienic Practice for Spices and Condiments (at Step 4). This text, based on an ISO draft proposal, had been presented at the 24th Session of CCFH, following the decision of the 18th Session of the Commission to refer it to CCFH for consideration. Government Comments at Step 3 in response to CL 1989/49-FH were presented in Documents CX/FH 91/8 (France), CX/FH 91/8 - Add 1 (Canada) and Conference Room Document 4 (Malaysia).

38. In response to a question by the delegation of Thailand regarding the possibility to elaborate guidelines rather than a code, the Secretariat indicated that, in relation to GATT, both types of documents would have the same status as recommendations issued by Codex, as far as commodities moving in international trade were concerned.

39. Several delegations noted that the draft Code referred to spice essential oils, spice oleoresins and asked for clarification as to the difference between spices and condiments, and the products that should be covered. It was agreed that the Code should be concerned with products presenting a risk from contamination and that essential oils and oleoresins, which did not fall into this category, should be explicitly excluded.

40. The delegation of the USA, supported by the delegation of Canada, expressed its view that HACCP approach should be applied and that the draft code should be modified so as to cover more extensively all aspects of spices safety. The delegation of the Netherlands noted the importance of growing and harvesting conditions with regard to possible contamination of spices and suggested the Code should reflect this concern. The Committee discussed the necessity for incorporation of criteria regarding microbiology and mycotoxins, and the importance in so doing of taking into consideration the further uses of spices.

41. The Chairman stressed the importance of the participation of producer countries and their cooperation with importing countries in the drafting of such a Code, as they had the better experience in growing, harvesting or processing these plants, in order to achieve a realistic approach to the safety issues regarding spices.

42. In the light of these comments, the Committee agreed that the Secretariat would initiate the preparation of a new draft with the cooperation of Mexico, Madagascar and the Regional Coordinator for Asia on behalf of the Asian Region as producers, USA as both a producer and an importer, and Canada as an importer, to be circulated again at Step 3 of the Codex Procedure.

PROPOSED DRAFT GUIDELINE PROCEDURES FOR THE VISUAL INSPECTION OF LOTS OF CANNED FOODS (Agenda Item 11)

43. Prior to the introduction of this Item, the Delegation of Canada reported on the progress of the development of a pictorial manual of visible can defects. It was recalled that at the Committee's last session it had been agreed that such a manual should be prepared by the Delegation of Canada with the assistance of the Delegation of the United States. The Executive Committee, at its 37th Session, had however recommended that such a pictorial manual would be better prepared outside the Codex Alimentarius Commission Procedures because of its highly specialized nature (ALINORM 91/3, para. 61). The Delegation of Canada exhibited photographs of unacceptable can defects, and copies of the final draft of the manual which had been prepared in cooperation with the Delegations of France, Spain, United Kingdom and the United States. The delegation of Canada also noted that the Manual could also incorporate the Guideline Procedures for the Visual Inspection of Lots of Canned Foods once this text had been adopted by the Commission. It was noted that the Manual would be made available to the Codex Secretariat in a sufficient number of copies for distribution to Codex Contact Points and participants in the Committee on Food Hygiene, and that it would be available directly from the publisher to other interested parties. The Committee expressed its appreciation to the Delegation of Canada and to the other delegations which had participated in the development of the Pictorial Manual.

44. The Committee had for its discussion on the present agenda item, the Proposed Draft Guideline Procedures for the Visual Inspection of Lots of Canned Foods as contained in Appendix VI of ALINORM 91/13, and Government comments received from Canada in response to Codex Circular Letters 1989/49-FH and 1991/9-FH in document CX/FH 91/9.

45. The Committee agreed to amend the text of the Guideline Procedures to refer only to "acceptable" and "unacceptable" can defects, and to delete reference to the previous term "Objective 1" defects. The Committee could not, however, agree to the written proposal of Canada to include as an example a specific sampling plan for use in relation to examination for visual defects, or to make references to specific sampling plans elaborated elsewhere. The Committee was of the opinion that adequate advice was provided in Section 5 of the Guideline Procedures.

46. Amendments were made to the Explanatory Preface to indicate that the choice of statistically-based sampling plans depended on the nature of the inspection which was to be undertaken, and to indicate that decisions on sorting to remove defective cans should be undertaken by persons with experience in the evaluation of defective cans.

47. The Committee also agreed to include in the first paragraph of Section 1 - Introduction, a statement to the effect that once obviously defective cans had been removed by minimally trained personnel, expert advice should be sought on the acceptability of the remainder of the lot. In this regard, reference was made to the Guidelines for the Salvage of Canned Foods Exposed to Adverse Conditions, adopted by the Commission at its 19th Session.

Status of the Proposed Draft Guideline Procedures for the Visual Inspection of Lots of Canned Foods

48. The Committee agreed to advance the Proposed Draft Guideline Procedures to Step 5 of the Codex Elaboration Procedure, and recommended to the Commission that the text also be adopted at Step 8 by omitting Steps 6 and 7. The revised text of the Proposed Draft Guideline Procedures for the Visual Inspection of Lots of Canned Foods is attached to the present report as Appendix IV.

MICROBIOLOGICAL CRITERIA FOR FOODS TO BE FURTHER PROCESSED INCLUDING BY IRRADIATION (Agenda Item 12)

49. The Committee recalled that the Joint FAO/IAEA/WHO International Consultation Group on Food Irradiation (ICGFI) had, in May/June 1989, convened a Consultation under the above title. The report of this consultation (document WHO/EHE/FOS/89.5) had been sent to Codex Contact Points with CL 1990/38 - FH in October 1990. The objectives of this consultation had been to determine whether or not microbiological criteria relating to spoilage could be established as indicators for Good Manufacturing Practice (GMP). The reason for this attempt was that certain consumer groups criticized that processing technologies, in particular food irradiation, could be misused to "clean-up" dirty food, e.g. food that had not been produced and handled in accordance with GMP. For most of the foods considered by this Consultation there existed Codex Codes of Practice which defined GMP. As many Codes did not contain end-product specifications, this Consultation considered recommending criteria where these were absent and reviewed existing criteria which might apply to food for further processing. Microbiological guidelines were suggested for red meats (beef, pork, lamb), poultry, fish and crustaceans. For spices, herbs and vegetable seasonings only provisional guidelines were suggested, while for mechanically separated meats and frog legs no criteria could be prepared. The Consultation also reviewed the Codex Specifications for Cooked Peeled Frozen Shrimps and Prawns.

50. The Consultation had requested the Secretary of the Codex Alimentarius Commission to draw the Commission's attention to this report for further elaboration. The Executive Committee, at the 37th session, July 1990, noted that the proposal for microbiological criteria implied that amendments to current Codes of Hygienic Practice would be needed. It agreed that a Circular Letter be sent out requesting governments to comment whether or not the existing codes should be amended as proposed. As a consequence of the Executive Committee's decision, the Committee considered the following recommendations of the Consultation:

(1) to obtain more recent data on the microbiology of cooked peeled frozen shrimps and prawns produced under GMP, in order to see if a revision of the existing Codex Specifications could be appropriate, since it might be too strict;

(2) to incorporate, by means of revising the existing Codes of Hygienic Practice, guidelines for meat, poultry, fish and crustaceans;

(3) to obtain, through the Codex mechanism, data on the microbiology of spices, herbs and vegetable seasonings, mechanically separated meats and frog legs produced under GMP, in order to arrive at guideline levels for incorporation into appropriate Codes of Hygienic Practice.

51. In the ensuing debate only a few countries supported the idea of incorporating microbiological guidelines into existing Codes of Hygienic Practice as proposed by the Consultation. It was felt that microbiological criteria should rather be considered as tolerances within the control procedures in the framework of the HACCP concept. A revision of the microbiological criteria in the Codex Code on Hygienic Practice for Shrimps and Prawns was also not seen to be a priority. It was also felt that the Committee should endorse food irradiation as an additional food processing technology.

52. The Committee decided as follows:

- the existing Codes of Hygienic Practice should not be revised to incorporate microbiological guidelines;

- the concept of microbiological guidelines should be considered in the framework of the HACCP concept;

- food irradiation was seen as a technology which should be considered under those circumstances where the safety of a product can be achieved by the application of a processing technology.

CONSIDERATION OF ROUTINE MEDICAL EXAMINATION OF FOOD HANDLING PERSONNEL (Agenda Item 13)

53. The Committee recalled that WHO had convened a Consultation on Health Surveillance and Management Procedures for Food Handling Personnel (Geneva, 1988) and the report of this consultation (WHO Tech. Report Ser. Nr. 785, 1989) had been sent to Codex Context Points with Circular Letter 1990/38-FH in October 1990. There had been two main reasons for convening such a Consultation:

(1) there was an ongoing debate among health professionals and public health authorities on the relative merits, costs, and benefits of health surveillance of food handling personnel. Consequently, there was no uniformity in the procedures adopted by countries in undertaking such surveillance. There was also no uniformity in various Codex Codes of Hygienic Practice related to this matter.

(2) New foodborne pathogens (e.g. Campylobacter, E. coli H 157:0 7, Listeria monocytogenes) have emerged in recent years and their significance had to be examined relatively to their possible implications for the health surveillance of food handlers.

54. Among the various conclusions and recommendations of the WHO Consultation, the following was of particular interest to the work of this Committee.

"Pre-employment or routine medical and laboratory examinations of food handling personnel are of no value in the prevention of food borne diseases. For this reason, it is recommended that those governments, industries and institutions that rely at present on medical examinations of food handling personnel for the prevention of foodborne diseases should discontinue this practice."

55. The text in paragraph 6.2 (Medical Examinations) of the Recommended International Code of Practice - General Principles of Food Hygiene was - in the view of the WHO secretariat - not explicitly in line with the WHO Consultation recommendation. Paragraph 4.3.4.2 of the Code of Hygienic Practice for Poultry Processing was even in contradiction to the WHO consultation recommendation and several other versions in various other Codes of Hygienic Practice were open to interpretation

in this context. For these reasons, the WHO secretariat requested advice from the Executive Committee during the 37th session in July 1990, which decided to request the view of governments on this matter by means of a circular letter. Written responses from 8 countries were reflected in document CX/FH 91/11.

56. During the discussions most governments expressed the view that pre-employment and routine medical and laboratory examination of food handling personnel were not useful as far as preventing food borne diseases was concerned, although pre-employment health interviews did serve a useful purpose. The delegation of Thailand however expressed their view that pre-employment and routine medical examination of food handlers were necessary under certain conditions as they could be considered as primary prevention of food contamination. The language used in paragraph 6.2 of the Recommended International Code of Practice - General Principles of Food Hygiene was, in the view of the Committee, consistent with the WHO Consultation recommendation while allowing for different national legislations. The Committee decided that the Section did not need to be amended. However, the language in all other codes which differed from the one used in the General Principles Code, needed to be amended for the sake of consistency.

PREVENTION AND CONTROL OF SALMONELLOSIS AND SIMILAR FOODBORNE DISEASES (Agenda Item 14)

57. The Committee recalled that the Executive Committee, at its 37th Session in July 1990, had considered a paper on the above topic which had been prepared for WHO by Dr. G.J. Jackson and Dr. D.L. Archer of the US Food and Drug Administration, and Dr. C.F. Langford of Agriculture Canada (CX/EXEC 90/37/11). The Executive Committee had endorsed the recommendations contained in the paper in principle and requested the Secretariat to circulate the paper to Codex Member States for comments prior to detailed consideration by the Codex Committee on Food Hygiene (see ALINORM 91/3, paras 98-100). The paper was before the Committee as document CX/FH 91/12. No comments had been received in response to Codex Circular Letter 1991/9-FH. Noting the wide ranging recommendations contained in the Executive Summary of the paper, and taking into account the recommendations of the Chairman in relation to the future activities of the Committee in response to the challenges presented by the Commission as a result of the FAO/WHO Conference on Food Standards, Chemicals in Food and Food Trade (see para. 8 above), and the World Health Assembly resolution 42.40, the Committee agreed to discuss the paper in relation to a proposed revision of the Recommended International Code of Practice -General Principles of Food Hygiene (CAC/RCP 1-1969, Rev.2 (1985)).

58. The paper was introduced by Dr. G.J. Jackson of the Delegation of the United States who drew particular attention to the disparity between the rate of incidence of foodborne diseases and the control measures taken. He stated that the limited preventive measures aimed only at the intermediate processing phases of the food chain were insufficient, and that wider measures needed to be taken including the use of the Hazard Analysis of Critical Control Points (HACCP) concept. Dr. Jackson drew attention to the need to be concerned with all phases of food handling, from production to the point of use by the final consumer, and asked whether the responsibility of the Codex Alimentarius Commission covered such a broad scope of activities. Dr. Jackson posed the question of giving consideration, perhaps, to codes of practice covering foods produced by genetic modification. Finally, Dr. Jackson drew attention to the need for Codex Codes of Practice to provide greater information; for example in providing technical references for the professional reader, and including more generally worded statements of intent for the general or lay reader.

59. The Committee welcomed the document and expressed its appreciation to the authors of the paper. There was general agreement with the approach described, but some delegations questioned whether or not such a broad approach might extend beyond the terms of reference of the Codex Alimentarius Commission, for example, into the areas of zoosanitary codes or consumer education. The Committee considered that the approach proposed in the paper could be reconciled with the Committee's Terms of Reference and with the general application of Codes of Practice within the legal framework existing at the national level.

60. The Committee noted that Codex Codes of Practice were advisory texts, and it was the responsibility of Member Governments to decide what use they wished to make of the Codes. In this regard, any member government which intended to incorporate provisions of the Codes into national legislation should be able to do so. On the other hand, Member Governments which used the Codes for advisory

purposes should have the opportunity to do so, and agreed statements of purpose and accompanying explanatory text would facilitate the use of the Codes used in this manner.

61 The Committee agreed that the current text of the General Principles of Food Hygiene did not provide adequate control of the possible sources of contamination entering the food chain. It agreed that such control should be extended to the extent possible throughout the food chain, beginning at the point of production (and possibly extending to the control of animal feed by elaborating specific codes of practice for these), through to the point of sale, as was mandated by the scope of the General Principles of Food Hygiene, Section 1.1. Nevertheless, the Committee recognized that there might be existing Codes developed by other Committees or Organizations which could provide adequate control and which could be incorporated into Codex Codes by reference.

62. There was a general consensus that any revision of the General Principles of Food Hygiene should be on a broad a basis as possible and should identify potential hazards which needed to be controlled, but should not be excessively detailed. It was considered that details for the control of specific commodities or processes should be incorporated into separate codes or into annexes to the general Code. Some delegations were of the view that statistics on epidemiology would be needed before action should be taken to embark on detailed codes for specific commodities.

63. The Committee agreed that Recommended International Code of Practice - General Principles of Food Hygiene should be revised as described above. In particular, it agreed that the format of the Code should include statements explaining the public health reason for the provisions which were being recommended. This was considered to be very important for the application of the Codes by developing countries, as well as for an understanding of the Codes by non-technical persons. Furthermore, the Committee agreed that new codes of practice would need to be developed to cover areas not currently covered or which would need to be developed in response to changes in the food industry, by consumer preferences, or in response to a better understanding of the epidemiology of specific foodborne illnesses. The Committee also agreed that there was a need to integrate the principles of the HACCP system into the General Principles of Food Hygiene and therefore into all of the Codes of Practice recommended by the Codex Alimentarius Commission. Finally, the Committee agreed that all technologies which offered the possibility of reducing the incidence of foodborne diseases outbreaks should be acknowledged by the revised General Principles.

64. The Committee recognized that the Codex Committee on Meat Hygiene and the Codex Committee on Fish and Fishery Products were currently considering Codes of Practice which covered many of the points raised above. It noted that it was within the scope of this Committee to coordinate the development of these new Codes in the light of changes made to the General Principles of Food Hygiene, and agreed that the present discussion should be brought to the attention of these Committees.

65. The Committee welcomed the kind offer of the Delegation of the United Kingdom to prepare, in cooperation with other delegations which had expressed an interest, an annotated draft revision of the General Principles of Food Hygiene which would then be circulated for comments in advance of the next session of the Committee. It agreed that governments would be requested at that time to indicate which additional codes of practice would be needed to ensure that the incidence of human foodborne salmonellosis or similar diseases would be reduced.

CONSIDERATION OF DRAFT CODES OF HYGIENIC PRACTICE FOR STREET-VENDED FOODS ELABORATED BY THE CODEX REGIONAL COMMITTEES (Agenda Item 15)

66. The Secretariat introduced document CX/FH 91/13, entitled "Consideration of Drafts and Core Elements of a Code of Hygienic Practice for Street Foods". The document summarized the development of regional codes of hygienic practice for street foods in the Codex framework, giving special attention to the progress made by the Codex Regional Coordinating Committees for Asia and for Latin America and the Caribbean.

67. The Committee noted that the Executive Committee and the Commission had encouraged the development of Regional Codes of Practice for Street Foods in view of the importance of this sector in providing good quality nutritional food to very large numbers of people at affordable prices, and thereby contributing to national

food security. The significant problem to be resolved was how to ensure an appropriate level of control of street foods without suppressing the industry by over-regulation.

68. The Secretariat reported that such codes were viewed as guides for hygienic practices which would have to be adapted to a variety of local conditions, but that nevertheless there were essential core elements related to the General Principles of Food Hygiene which would need to be retained in all such codes. In reviewing the draft codes prepared by the Codex Coordinating Committees (ALINORM 91/15, Appendix III and ALINORM 91/36, Appendix III) the Secretariat had noted that there were many similarities in the texts, but that there were aspects which were either contradictory or were in conflict with the General Principles of Food Hygiene. The Secretariat reported that in view of these discrepancies, it had been decided to accelerate the development of the Codes by the recruitment of a WHO Consultant, who would provide a uniform text for consideration by the Regional Coordinating Committees and the next session of this Committee.

69. The Delegation of Canada drew attention to an article entitled "International Activities in Street Foods" by R.J. Dawson and C. Canet (Food Control, July 1991, pp 135-139) which provided background on the importance of this sector worldwide. The Delegation of Peru called for urgent and clear advice from the Codex Alimentarius Commission, especially in view of the problems of cholera in the Region of Latin America in which street foods had been implicated as a major vehicle of transmission of the disease. The Delegation noted that specific activities carried out by FAO and PAHO in that country and in the Region had been well received, but that advice in the form of a Code which could be used by countries and local authorities was essential.

70. Some delegations questioned whether or not it would be more appropriate for such advice to be provided directly from FAO and WHO rather than through the Codex system. The question was also raised as to whether such advice would be directed to national authorities in the form of codes to be incorporated into the legislative framework, or as educational material to street food handlers. The Delegation of Rwanda stated that national legislation in that country prohibited the sale of foods in the street. The delegations of Thailand and Peru expressed their view that it would be useful for FAO and WHO to organize studies to be carried out to develop data for the control of street foods.

71. The Committee welcomed the proposal that a Consultant prepare a uniform model code based on the core elements previously discussed, the General Principles of Food Hygiene, and the relevant provisions of the two Codes prepared by the Codex Regional Coordinating Committees for Asia and for Latin America and the Caribbean. It agreed that the Code should contain sufficient explanatory material that governments or other authorities using it would be able to understand the reason behind individual provisions, and that this information should be such that it could be used as the basis of educational programmes if required. The delegation of Thailand, however, stated that the code should only contain general technical information relevant to the safeguard of consumers health. The Committee stressed however the need for this work to be carried out with the utmost urgency and for a first draft to be available by the time of the 8th Session of the Codex Regional Coordinating Committee for Asia in January 1992. It also agreed that the draft should be reviewed by the relevant Regional Coordinating Committees and by this Committee at its next session.

SUMMARY OF RECOMMENDATIONS ON LISTERIA MONOCYTOGENES MADE BY EXPERT CONSULTATIONS (Agenda Item 16)

72. The Committee recalled that at its 24th Session it had requested the Secretariat to collect information on national and expert recommendations concerning the control of Listeria monocytogenes (ALINORM 91/13 paras. 99-103). Information was requested by means of Codex Circular Letter 1990/9-FH, and responses were received from Canada, Finland, France, The Netherlands, Switzerland and the USA. These responses, together with the recommendations of the WHO Informal working Group on Foodborne Diseases, had been summarized and analyzed in the working paper prepared by the Secretariat, document CX/FH 91/15. Additional information was available to the Committee in Conference Room Documents 2 (The Netherlands, Côte d'Ivoire), 5 (International Dairy Federation - IDF) and 6 (Germany).

73. The Secretariat had concluded that control strategies for Listeria monocytogenes appeared to focus on several areas:

- Foods with a high potential for contamination and growth, or with susceptible populations at increased risk were targeted for special attention;

- Control strategies, incorporating HACCP, were used to cover the whole food chain of production, processing, retailing and food services;

- Several microbiological criteria based on the absence of Listeria monocytogenes in a fixed sample size were being applied, but by no means universally;

- There was a strong emphasis on training and consumer education targeted to specific user groups;

- Continuing research on methodology for the detection, quantitation and epidemiology of the organism was required;

In principle, established Codes of Hygienic Practice, particularly the proposed revised General Principles of Food Hygiene in combination with specific commodity codes, should be used to control Listeria monocytogenes in specific foods. The Proposed Draft Code of Hygienic Practice for Uncured/Unripened and Ripened Soft Cheese was such an example.

74. The Committee agreed that application of the HACCP system and its introduction into relevant Codes of Hygienic Practice, particularly the General Principles of Food Hygiene and the Proposed Draft Code of Hygienic Practice for Uncured/Unripened and Ripened Soft Cheese, was fully appropriate. It noted, however, that HACCP procedures required a consideration of the nature of the food, its intended further handling and its end use, and were intended to ensure that foods entering the marketing chain did not represent a hazard to the consumer.

75. The Committee also called for organizations outside the Codex Alimentarius Commission to continue to work on the development of analytical and surveillance methodology for the use of Member Countries, and for Member Countries to develop training and consumer education programmes which would lead people to understand the nature and extent of the risks involved with Listeria monocytogenes.

76. In response to the view expressed by several delegations as to the establishment and application of quantitative tolerances for Listeria monocytogenes, the Committee noted that the use of such tolerances remained controversial and that there were different professional points of view as to the usefulness of such tolerances in public health protection. In view of the potential problems in trade deriving from the use of tolerances as a public health measure, the Committee agreed to request the Secretariat to collect information on tolerances being applied by counties, including identification of the commodities to which they applied and any sampling plans and methodologies which were used, for consideration at the Committee's next Session.

GENERAL HACCP DEFINITIONS AND PROCEDURES FOR USE BY CODEX (Agenda Item 17)

77. The Committee had before it Conference Room Document No. 8, which was prepared by an ad hoc working group on the basis of document CX/FH 91/16. This latter document was the report of a Working Group which had been established by the committee at its 24th Session to determine how the Hazard Analysis Critical Control Point (HACCP) system could be introduced into Codex Codes of Practice and other recommendations. The Working Group, consisting of Canada, Finland, France, Ireland, New Zealand, Norway, Sweden, United Kingdom and the United States, had met in the United Kingdom in June 1991 under the joint chairmanship of Dr. A. Baird-Parker (United Kingdom) and Dr. C. Adams(USA). The Conference Room Document was introduced by Dr. Baird-Parker.

78. The Committee welcomed the recommendations of the working group. In particular, it noted that the revised text was now more widely applicable than originally proposed, with general application outside the exclusive development of Codex Codes of Practice, and contained principles and procedures which could be

used by any authority, producer or processor when applying the HACCP system. It also noted that the paper had been extended in its application to cover the entire food chain, from the point of production through to the final consumer.

79. The Committee agreed that the principles for the application of HACCP should be incorporated into Codex Codes of Practice, and particularly stressed that this should be done both through the revision of the General Principles of Food Hygiene (see paras 61 to 65 above), and by incorporating a relevant statement in the Procedural Manual of the Codex Alimentarius Commission. It also recommended that existing Codex Codes of Practice should be examined and annexes included, as appropriate, giving examples of application of the HACCP system to that particular code.

Status of the Draft Principles and Application of the Hazard Analysis Critical Control Point (HACCP) System

80. The Committee agreed that the Draft Principles and Applications of the Hazard Analysis Critical Control Point (HACCP) System should be submitted to governments for comment at Step 3 of the Codex Procedure. In view of the importance of the document and HACCP ability to aid and improve regulatory food control programmes while at the same time being compatible with other quality assurance systems, it strongly recommended that the Principles should be reviewed by the Commission under an accelerated elaboration procedure, by omission of Steps 6 and 7 at the appropriate state in the Procedure. The Draft Principles are attached to the present report as Appendix VI.

OTHER BUSINESS (Agenda Item 18)

81. The Committee noted that the Agenda for its next session would include the following:

- Proposed Draft Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods, at Step 7;
- Proposed Draft Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf-Life, at Step 4;
- Proposed Draft Code of Hygienic Practice for Uncured/Unripened and Ripened Soft Cheese, at Step 4;
- Proposed Draft Code of Hygienic Practice for Spices, at Step 4;
- Proposed Core Elements for Use in Regional Codes of Hygienic Practice for Street-Vended Foods, at Step 4;
- Proposed Draft Revised International Code of Practice - General Principles of Food Hygiene, At Step 4, including the Use of the Hazard Analysis of Critical Control Points (HACCP) System.
- Draft Principles and Application of the Hazard Analysis Critical Control Point (HACCP) System, at Step 4.
- Consideration of a paper on the use of national tolerances applied for control of Listeria monocytogenes.

82. The Delegation of the United States referred to the Codes of Good Irradiation Practice prepared by the International Consultative Group on Food Irradiation (ICGFI) for the control of pathogens in certain foods, and requested the Committee to consider the incorporation of these codes into the Codex Alimentarius. The Committee recalled, however, that the development of these Codes as Codex documents had been considered by the Executive Committee of the Codex Alimentarius Commission at its 36th Session (ALINORM 89/4, paras 47-48), and the Executive Committee had decided not to duplicate the work of ICGFI in this area. The Committee, reaffirming its view that the irradiation was a useful technology for the control of foodborne pathogens, encouraged Member Countries to obtain copies of the ICGFI Codes from the ICGFI Secretariat in Vienna.

83. The Delegations of the Netherlands and Peru recalled the problems caused to international trade in foods as a consequence of the outbreak of cholera in Latin America. Although particularly grateful for the efforts of FAO, WHO and PAHO

to provide advice on the safety of the foods affected and the measures taken to control contamination at the source and up to the point of export, the Committee agreed that it would be appropriate for Codex to provide advice to Member Countries on actions which could be taken by both exporters and importers in the case of a major outbreak of food-borne disease or widespread contamination of food due to environmental or industrial causes in particular to prevent unnecessary restrictions of international trade. The Secretariat was requested to prepare a paper which could be first examined by the Executive Committee with a view to its further elaboration in an appropriate Codex Committee or Committees. The Committee noted that WHO was preparing a policy document on the control of cholera, which contained chapters on food and the impact of cholera in relation to international trade. The Representative of WHO indicated that the policy document would be available at the end of 1991, and would be made available to Codex Contact Points.

DATE AND PLACE OF THE NEXT SESSION (Agenda Item 19)

84. The Chairman indicated that the United States, as host government of the Committee, was of the opinion that a further session of the Committee would be needed in advance of the 20th Session of the Codex Alimentarius Commission. He indicated that the United States was considering holding the 26th Session of the Committee in Washington, D.C. in February/March 1993, but that the final dates would be decided between the Host Government and the Codex Secretariat.

SUMMARY STATUS OF WORK

Subject Matter	Step	Action by	Document Reference
Draft General Provisions relating to Hygiene in Codex Standards	8	Governments 20th CAC	ALINORM 93/13, App. II
Draft Code of Hygienic Practice for Pre-Cooked and Cooked Foods in Mass Catering	8	Governments 20th CAC	ALINORM 93/13, App. III
Draft Guidelines Procedures for the Visual Inspection of Lots of Canned Foods	5/8	Governments 20th CAC	ALINORM 93/13, App. IV
Proposed Draft Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods	6	USA Governments 26th CCFH	ALINORM 93/13, para. 20
Proposed Draft Code of Hygienic Practice for Uncured/Unripened Cheese and Ripened Soft Cheese	3	Netherlands/ France Governments 26th CCFH	ALINORM 93/13, para. 36
Proposed Draft Code of Hygienic Practice for Spices and Condiments	3	Governments 26th CCFH	ALINORM 93/13, para. 42
Proposed Draft Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf Life	3	Governments 26th CCFH	ALINORM 93/13, App. V
Proposed Draft Principles and Application of the Hazard Analysis Critical Control Point (HACCP) System	3	Governments 26th CCFH	ALINORM 93/13, App. VI
Proposed Draft Revised General Principles of Food Hygiene	-	United Kingdom Governments 26th CCFH CCGP	ALINORM 93/13, para. 65
Proposed General Code of Hygienic Practice for Street Vended Foods	-	38th Executive Committee CCASIA/CCAFR CCLAC 26th CCFH	ALINORM 93/13, para. 71
Summary of Recommendations on Listeria monocytogenes	-	Codex Secretariat 26th CCFH	ALINORM 93/13, paras 73-76

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DRAFT GENERAL PROVISIONS RELATING TO HYGIENE
(At Step 8 of the Procedure)

Commodity Committees may wish to select one of the following texts according to the nature of the product subject to the standard:

1. For shelf-stable products where microbiological spoilage before or after process is unlikely to be of significance:

- It is recommended that the product covered by the provisions of this Standard be prepared in accordance with the appropriate sections of the General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (Ref. No. CAC/RCP 1-1969, Rev. 2 - 1985).

2. For shelf-stable products, heat-processed in hermetically sealed containers:

- It is recommended that the product covered by the provision of this standard be prepared in accordance with the General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 2 - 1985) and, where appropriate, with the Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods (Ref. CAC/RCP 23-1979, Rev. 1 - 1989) or other Codes of Hygienic Practice as recommended by the Codex Alimentarius Commission.

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

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

  (a) shall be free from microorganisms capable of development in the food under normal conditions of storage; and

  (b) shall not contain any substance originating from microorganisms in amounts which may represent a health hazard.

3. For all other products:

- It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 2 - 1985), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to this product. (A list may follow).

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

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

  (a) shall be free from microorganisms in amounts which may represent a hazard to health;

  (b) shall be free from parasites which may represent a hazard to health; and

  (c) shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

DRAFT CODE OF HYGIENIC PRACTICE FOR PRE-COOKED AND COOKED FOODS IN MASS CATERING (At Step 8 of the Procedure)

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DRAFT CODE OF HYGIENIC PRACTICE FOR PRE-COOKED AND COOKED FOODS IN MASS CATERING (At Step 8 of the Procedure)

EXPLANATORY PREFACE

A. The Code has, as far as possible, been made consistent with the format and content of the General Principles of Food Hygiene.

B. The need for this Code is based on the following considerations:

1. Epidemiological data show that many outbreaks of food poisoning are caused by food produced in mass catering.

2. Large-scale catering operations are particularly hazardous because of the way the food is stored and handled.

3. Outbreaks can involve large numbers of people.

4. Persons fed by mass catering are often especially vulnerable - for instance children, the elderly and hospital patients, especially those who are immuno-compromised.

C. The Hazard Analysis Critical Control Point (HACCP) system has been applied to the Code.

The HACCP System consists of:

1. An assessment of hazards associated with growing, harvesting, processing/manufacturing, marketing, preparation and/or use of a given raw material or food product.

2. Determination of critical control points required to control any identified hazard(s).

3. Establishment of procedures to monitor critical control points.

The critical control points have been identified in the Code and explanatory notes describing the risk and giving the type and frequency of controls to be applied, have been inserted in connection with the relevant paragraphs. (CCP - Notes) WHO/ICMSF 1982. Report of the WHO/ICMSF Meeting on Hazard Analysis, Critical Control Point System in Food Hygiene. World Health Organization VPH 82/37, Geneva, and also the ICMSF handbook on the principles and application of HACCP).

D. Properly trained inspectors and personnel and an adequate sanitary infrastructure are necessary in order to implement the Code satisfactorily.

SECTION I - SCOPE

1. This Code deals with the hygienic requirements for cooking raw foods and handling cooked and precooked foods intended for feeding large groups of people, such as children in schools, the elderly either in old peoples homes or by means of "meals on wheels", patients in nursing homes and hospitals, persons in prisons, schools and similar institutions. These categories of people are supplied as groups with the same types of foods. In this social type of mass catering the consumer has limited choice in the food, he or she eats. This Code is not intended for industrial production of complete meals, but may give guidance on specific points to those who are involved. For reasons of simplicity, foods served raw to the consumer, are not included. This does not necessarily mean that these foods will not constitute a hazard to health.

2. The foods covered in this code are defined at Section II paragraphs 2.6.a and 2.6.b. The information in the following paragraphs refer only to precooked foods as defined at paragraphs 2.6.b: Paragraphs 4.3.14.2, 4.3.14.3, 4.3.19.2, 7.6, 7.7, 7.8, 7.9.4 and 7.9.5.

SECTION II - DEFINITIONS

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

2.1 Catering - the preparation, storage and, where appropriate, delivery of food for consumption by the consumer at the place of preparation or at a satellite unit.

2.2 Catering Establishment - a kitchen where food is prepared or reheated for catering.

2.3 Chilled Food - product intended to be maintained at temperatures not exceeding 4°C in any part of the product and stored for no longer than five days.

2.4 Cleaning - the removal of soil, food residues, dust, grease or other objectionable matter.

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

2.6 a) Cooked Food - foods cooked and kept hot or reheated and kept hot for serving to the consumer.

b) Precooked Foods - foods cooked, rapidly chilled and kept refrigerated or frozen.

2.7 Disinfection - the reduction, without adversely affecting the food by means of hygienically satisfactory chemical agents or physical methods, of the number of micro-organisms to a level that will not lead to harmful contamination of food.

2.8 Establishment - any building(s) or areas(s) in which food is handled after harvesting and the surroundings under the control of the same management.

2.9 Food Handling - any operation in the preparation, processing, cooking, packaging, storage, transport, distribution and service of food.

2.10 Food Handler - every person handling or coming into contact with food, or with any equipment or utensil used in food handling.

2.11 Food Hygiene - all measures necessary to ensure the safety, soundness and wholesomeness of food at all stages from its growth, production or manufacture until its final serving to individuals.

2.12 Frozen Food - product maintained at a temperature equal to or below -18°C in any part of the product.

2.13 Lot - a definitive quantity of a cooked or pre-cooked food produced under essentially the same conditions at the same time.

2.14 Mass Catering - the preparation, storage and/or delivery and serving of food to a large number of people.

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

2.16 Pests - Insects, birds, rodents and any other animal capable of directly or indirectly contaminating food.

2.17 Meal Assembly - composing or placing food for one person in or on a suitable container, where it will be kept until delivery to the consumer.

2.18 Portioning - division of food before or after cooking into single or multiple portions.

2.19 Potentially Hazardous Food - food capable of supporting rapid and progressive growth of infectious or toxigenic microorganisms.

SECTION III - HYGIENE REQUIREMENTS IN PRODUCTION/HARVESTING AREA

Are not covered in this Code.

For raw material Requirements: See Section VII.

SECTION IV - A. PRODUCTION OR PREPARATION ESTABLISHMENT: DESIGN AND FACILITIES

This section covers the areas where the food is prepared, cooked, chilled, frozen and stored.

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 - 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 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. All construction materials should be such that they do not transmit any undesirable substances to the food.

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

4.3.3 Buildings and facilities should be designed to permit easy and adequate cleaning and to facilitate proper supervision of food hygiene.

4.3.4 Building 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.

> Note: Cross-contamination is an important factor that contributes to foodborne outbreaks. Food can be contaminated with harmful organisms after cooking sometimes from a food handler, and often directly or indirectly from raw food. Operations such as the cleaning and washing of vegetables, the washing up of equipment, utensils, crockery and cutlery, and the unpacking, storage or refrigeration of raw materials should be performed in separate rooms or locations especially designed for that purpose. Managers and food inspectors should regularly check that the separation principle is properly applied. (See also CCP-Note in 4.4.1)

4.3.6 Buildings and facilities should be designed to facilitate hygienic operations by means of a controlled and 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 for the process and product.

4.3.7 In food handling areas:

- Floors, where appropriate, should be of waterproof, non-absorbent, washable, and non-slip 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 waterproof, non-absorbent and washable sealed 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 designed, constructed and finished to prevent accumulation of dirt and minimize condensation, mould development and flaking, and should be easy to clean.

- Windows and other openings should be constructed to avoid accumulation of dirt and those which open should be fitted with insect-proof 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, be self-closing and close fitting.

- Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes, should be situated and constructed to prevent 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 a manner 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 into food handling areas.

4.3.10 Where appropriate, establishments should be designed so 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 Water Supply

4.3.12.1 An ample supply of water, in compliance with the WHO "Guidelines for Drinking Water Quality", 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.

> Note: Samples should be taken regularly, but the frequency should depend upon the origin and the usage of the water, e.g. more frequent from private supplies than from public supplies. Chlorine or other suitable disinfectants may be used. If chlorination has been employed checks should be made daily by chemical tests for available chlorine. The point of sampling should preferably be at the point of usage, but occasionally it would be useful to sample at the point of entry of the water to the establishment.

4.3.12.2 There should be a system to ensure an adequate supply of hot potable water.

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

4.3.12.4 Steam used in direct contact with food or food contact surfaces should contain no substance which may be hazardous to health or may contaminate the food.

4.3.12.5 Non-potable water used for steam production, refrigeration, fire control and other similar purposes not connected with food 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.

4.3.13 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 constructed to avoid contamination of potable water supplies. All wastepipes should be properly trapped and lead to a drain.

4.3.14 Refrigeration

4.3.14.1 Establishments should have refrigerating and/or freezing cabinets large enough to accommodate raw materials at adequate temperature in order to comply with the requirements of Section 7.1.4 and 7.1.5.

> Note: Cross contamination of pathogens from raw commodities to prepared foods frequently occurs in the refrigerator. Therefore, raw foods, particularly meat, poultry, liquid egg products, fish and shellfish, must be strictly separated from prepared foods, preferably by the use of different refrigerators.

4.3.14.2 Establishments should have refrigerating and/or freezing cabinets or equipment (freeze tunnel) for chilling and/or freezing in order to comply with requirements of Sections 7.7 and 7.8.

> Note: A specially designed rapid chilling system is desirable. Rapid chilling or freezing of large quantities of food requires proper equipment capable of extracting the heat rapidly from the largest quantity of food likely to be produced.

4.3.14.3 Establishments should also have refrigerating and/or freezing cabinets or equipment for chilled and/or frozen storage of prepared food corresponding to thee maximum daily activity of the establishment and in order to comply with requirements of Sections 7.7 and 7.8.

4.3.14.4 All refrigerated spaces should be equipped with temperature measurement devices. Where appropriate the use of temperature recording devices is recommended. They should be clearly visible when used and should be placed in a manner to record the maximum temperature of the refrigerated space as accurately as possible. If possible cabinets for chilled and or/frozen storage of food should be equipped with temperature alarms.

Note: The accuracy of the temperature-recording devices should be checked at regular intervals and tested for accuracy against a standard thermometer of known accuracy. Such tests should be performed prior to installation, and at least once a year thereafter or more frequently as may be necessary to assure their accuracy. A dated record of such tests should be kept.

4.3.15 Changing facilities and toilets

Adequate, suitable, and conveniently located changing facilities and toilets should be provided in all establishments. Toilets should be designed to ensure hygienic removal of waste matter. These areas should be well lit, ventilated and appropriately 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 preparation, and with suitable hygienic means of drying hands, should be provided adjacent to toilets and positioned so 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.

4.3.16 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 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 preferable. The facilities should be furnished with properly trapped waste pipies leading to drains.

4.3.17 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.

4.3.18 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 food preparation and 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.

4.3.19 Ventilation

4.3.19.1 Adequate ventilation should be provided to prevent excessive build-up of heat, steam condensation and dust and to remove contaminated air. The direction of the air flow within the plant 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.

A device for effectively removing cooking steam and vapors should be installed above cooking units.

In rooms where food is being handled after chilling the temperature should not exceed 15ºC. However, if the temperature of 15ºC cannot be maintained, food being handled or prepared should be exposed to room temperature for as short a time as possible; ideally, 30 minutes or less. (see 7.6)

4.3.20 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 food, potable water, equipment, building or roadways on the premises.

4.4 Equipment and Utensils

4.4.1 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 substance, 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. Suitable materials include stainless steel, synthetic wood and rubber substitutes. 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 source of contamination. The use of different metals in such a way that contact corrosion can occur should be avoided.

CCP Note: Equipment and utensils constitute a source of potential cross-contamination. In addition to regular routine cleaning, it is essential that all equipment and utensils used for raw foods be thoroughly disinfected before they are used for cooked and precooked foods. If at all possible, separate utensils should be used for raw and cooked products. If this is not possible, thorough cleaning and disinfection is necessary.

4.4.2 Sanitary design, construction and installation

4.4.2.1 All equipment and utensils should be designed and constructed 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 a manner to permit easy access and thorough cleaning.

Note: Only properly designed equipment is satisfactory for bulk cooking. Mass-catering cannot be performed safely merely by increasing size or quantity of the type of equipment traditionally used in conventional kitchens for preparation of individual dishes. The capacity of the equipment used should be adequate to permit the hygienic production of food.

4.4.2.2 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.

4.4.3 Equipment identification

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

4.4.4 Equipment and utensil storage

Portable equipment such as spoons, beaters, pots and pans, etc., should be protected from contamination.

SECTION IV - B. SERVING ROOMS: DESIGN AND FACILITIES

This section covers the area where food is served which may include re-heating and storage.

In principle, the requirements mentioned in Section IV - A. apply also to serving rooms.

Where the foods served are those defined in paragraph 2-6 a, paragraphs 4.3.14.2, 4.3.14.3 and 4.3.19.2 do not apply.

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 - Washing up

5.2.1 Cleaning and disinfection should meet the requirements of this Code.

For further information on cleaning and disinfection procedures, see Annex I of the General Principles of Food Hygiene (CAC/VOL. A-Ed. 2, 2nd Rev. (1985)).

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

> Note: Equipment, utensils etc. in contact with food, particularly raw food, (Fish, meat, vegetables) will be contaminated with micro-organisms. This may adversely affect products handled subsequently. Therefore, cleaning including dismantling is necessary at frequent intervals during the day, at least after every break and when changing from one food product to another. The purpose of dismantling cleaning and disinfection at the end of each working day is to hinder build-up of possibly pathogenic microflora. Monitoring should be done by regular inspection.

5.2.3 Adequate precautions should be taken during cleaning or disinfection of rooms, equipment or utensils to prevent food from being contaminated by wash water, detergents and disinfectants. Cleaning solutions should be stored in adequately marked non-food containers. 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 potable water before the area or equipment is again used for handling food.

> Note: High pressure hoses produce aerosols and therefore should not be used during production. Care should be taken when using high pressure hoses not to contaminate food contact surfaces with organisms from floors, drains, etc. Presence of moisture may promote the growth of *Listeria monocytogenes* and other pathogenic microorganisms and, therefore, equipment and floors should be kept as dry as possible.

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.

5.2.5 Maintenance, cleaning tools and cleaning chemicals such as brooms, mops, vacuum cleaners, detergents, etc. should be maintained and stored in a way that does not contaminate food, utensils, equipment or linens.

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

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

5.3 Hygiene Control Programme

A permanent written cleaning and disinfection procedure 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 Wastes

In kitchen and food preparation rooms, by-products and waste products should be collected in single-use leak-proof bags or in properly labelled re-usable containers. These should be sealed or covered and taken from the working area as soon as they are full or after each working period and placed (single-use bags) or emptied (re-usable containers) in covered waste bins which must never be introduced into the kitchen. Re-usable containers should be cleaned and disinfected each time they are taken back into the kitchen.

Waste bins should be kept in a closed area reserved for the purpose separate from the food storage rooms. The area should be kept at as low a temperature as possible, well ventilated, protected from insects and rodents and should be easy to clean, wash and disinfect. The waste bins should be cleaned and disinfected each time after use.

Cartons and wrappers should, as soon as they are empty, be removed under the same conditions as waste materials. Waste compressing equipment should be separated from any food handling area.

If a system of ducted waste disposal is in use, it is imperative that offal, scraps and waste be placed in closed single-use bags. The duct opening should be cleaned and disinfected daily.

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.

Note: Insects and rodents are known carriers of pathogenic bacteria from areas of contamination to prepared foods and food contact surfaces therefore their presence in food preparation areas should be prevented.

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 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 hazards 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. Appropriate records of pesticide usage should be maintained.

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.

CCP Note: Records of pesticide usage should be kept and periodically checked by a responsible supervisor.

5.7 Storage of Hazardous Substances

5.7.1 Pesticides or other non-food 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 disposed and handled only by authorized and properly trained personnel. Extreme care should be taken to avoid contamination of food. Food containers or containers which are used to handle food, should not be used to measure, dilute, dispense or store pesticides or other substances.

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 Personnel Effects and Clothing

Personal effects and clothing should not be deposited in food 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 food and in personal hygiene so that they understand the precautions necessary to prevent contamination in 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, whether because of epidemiological considerations, the nature of food prepared in a particular establishment of 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 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 persons so affected should immediately report to the management that he/she is ill.

CCP Note: If an employee is restricted from working in a food handling area because of a communicable disease, he/she should receive clearance from a competent medical professional before returning to work.

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 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.

Hands should be washed and disinfected immediately after handling any material which might be capable of transmitting disease, or contaminating food or equipment. 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 and/or dried in food handling or preparation areas. During periods where 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.

Note: Gloves may be useful in protecting the food handler from the product and also may improve the sanitary handling of food. Torn or punctured gloves should be discarded to avoid leakage of any accumulated perspiration, which will contaminate food with high numbers of micro-organisms. Chain mail gloves are particularly difficult to clean and disinfect because of their construction: careful cleaning followed by heating or prolonged immersion in disinfectant is necessary. Gloves must be made from materials suitable for food contact. Some gloves made from reprocessed fibers may not be suitable when handling food.

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, 6.3, 6.4 and 6.7.

6.10 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

7.1.1 No raw materials 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.

7.1.2 Raw materials or ingredients should be inspected and sorted prior to the cooking process and where necessary laboratory tests should be made. Only clean sound raw materials or ingredients should be used in preparation of food.

7.1.3 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 supplied frequently and regularly, and excessive quantities should not be stored.

7.1.4 Chill stored raw foods of animal origin between 1 and 4°C. Other raw foods which require refrigeration, such as certain vegetables, should be stored at as low a temperature as quality permits.

> Note: First in - first out is a good general principle. But age alone may be an imperfect indication of quality. The history of raw materials in terms of intrinsic quality and temperature history also needs to be taken into account so that different batches can be used in proper sequence. For chilled raw materials the colder the storage temperature, without freezing, the better. Some common human pathogens can grow, albeit slowly, at chill temperatures. Yersinia enterocolitica can grow very slowly at 0°C, Clostridium botulinum type E and non-proteolytic types B and F at 3.3°C and Listeria monocytogenes at 0°C.

7.1.5 Frozen raw materials which are not immediately used should be maintained or stored at or below -18°C.

7.2 Prevention of Cross-Contamination

7.2.1 Effective measures should be taken to prevent contamination of cooked and pre-cooked foods by direct or indirect contact with material at an earlier stage of the process. Raw food should be effectively separated from cooked and pre-cooked foods. (See also 4.4.1).

> Note: Raw meat, poultry, eggs, fish and shellfish and rice are frequently contaminated with food-borne pathogens when they reach food service establishments. Poultry, for example, frequently harbours salmonellae which may be spread to surfaces of equipment, to the hands of workers and to other materials. The possibility of cross-contamination should always be considered.

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 materials or semi-processed products and have changed into clean protective clothing.

7.2.3 Hands should be washed thoroughly between handling products at different stages of processing.

Note: Food handlers can be a source of contamination. For example, cooked ingredients in potato salad can become contaminated by food handlers during mixing and preparation. Hazard analysis should therefore include observations of food handling and hand-washing practices of the kitchen staff.

7.2.4 Potentially hazardous raw products should be processed in separate rooms, or in areas that are separated by a barrier, from areas used for preparing ready to eat foods.

7.2.5 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 cooked or pre-cooked foods. It is preferable to have separate equipment for handling of raw materials and cooked pre-cooked foods, in particular apparatus for slicing and mincing.

7.3 Use of Water in the Food Process

Raw fruits and vegetables to be used in meals should be thoroughly washed in potable water before addition to the meals.

7.4 Thawing

7.4.1 Frozen products, especially frozen vegetables can be cooked without thawing. However, large pieces of meat or large poultry carcasses often do need to be thawed before cooking.

7.4.2 When thawing is carried out as an operation separated from cooking this should be performed only in:

a) a refrigerator or purpose-built thawing cabinet maintained at a temperature of 4°C or below.

or

b) running potable water maintained at a temperature not above 21°C for a period not exceeding 4 hours.

or

c) a commercial microwave oven only when the food will be immediately transferred to conventional cooking units as part of a continuous cooking process or when the entire, uninterrupted cooking process takes place in the microwave oven.

CCP Note: Hazards associated with thawing include cross-contamination from drip and growth of micro-organisms on the outside before the inside has thawed. Thawed meat and poultry products should be checked frequently to make sure the thawing process is complete before further processing or the processing time should be increased to take into account the temperature of the meat.

7.5 Cooking Process

Note: The cooking process should be designed to maintain as far as possible the nutritional value of the food.

Note: Use only fats or oils destined for this purpose. Frying fats and oils should not be overheated. The temperature is dependent on the nature of the oil or fat used. Follow the instructions of the supplier or the jurisdictionalrequirements if they exist, but frying fats or oils should not be heated above 180°C.

Fats and oils should be filtered before each frying operation to remove particles of food with a filter especially adapted for this purpose. (Deep-fryer should be equipped with a tap to allow for evacuation of oil from the bottom). The quality of oil or fat should regularly be checked for odour, taste and smoking colour, and if necessary, changed. If the quality is suspect, the frying oil can be checked by commercial test kit. If the result of this test is positive, a sample can be further examined for smoke point, free fatty acids and especially for polar compounds.

CCP Note: Frying fats or oils can become dangerous for consumer's health. Quality of frying fats or oils should be strictly controlled.

Note: Frying fats and oils should not be over-heated. Fats and oils should be changed immediately as soon as any changes in colour, flavour or odour are evident.

7.5.1 The time and temperature of cooking should be sufficient to ensure the destruction of non-sporing pathogenic micro-organisms.

Note: Boned rolled joints of meat are convenient for cooking, but the operation of removing the bone and rolling the meat will transfer microbes from the surface to the centre, where they are better protected from the heat of cooking. For the safe production of rare cooked beef, the centre of joints must reach a minimum of 63°C in order to eliminate contaminating salmonellae. The proper use of other time/temperature combinations which would ensure safety is acceptable.

For large poultry carcasses which are not normally cooked to a rare state or eaten rare, and where salmonellae are also a hazard, salmonellae will be killed if a temperature of 74°C is achieved in the deep thigh muscle. It is not advisable to stuff the body cavity of large poultry carcasses because (a) the stuffing can be contaminated with salmonellae and may not achieve a temperature high enough to kill them, and (b) spores of Clostridium perfringens will survive cooking. Other techniques are available to allow for safe preparation of stuffed carcasses, such as limiting volume, establishing geometric center time/temperature controls and immediate removal of stuffing for service or to facilitate cooling. Stuffed birds cool very slowly and Clostridium perfringens will germinate and multiply during this time. The effectiveness of the cooking process should be checked regularly by measuring the temperature in the relevant parts of the foods.

7.5.2 When grilled, roasted, braised, fried, blanched, poached, boiled, or cooked products are not intended for consumption on the day they are prepared, the cooking process should be followed by cooling as quickly as possible.

7.6 Portioning Process

7.6.1 Strict conditions of hygiene should apply at this stage in the process. The portioning process should be completed within the minimum practicable period of time which should not exceed 30 minutes for any chilled product.

7.6.2 Only well cleaned and disinfected containers should be used.

7.6.3 Containers with lids are preferred so that the food is protected against contamination.

7.6.4 In large scale systems where the portioning process of cook-chilled foods can not be performed in 30 minutes, this portioning should take place in a separate area in which the ambiant temperature should be 15°C. The temperature of the food should be monitored by temperature probes. The product should be served immediately or placed in cold storage at 4°C.

7.7 Chilling Process and Storage Conditions of Chilled Food

7.7.1 Immediately after preparation chilling should be carried out as quickly and efficiently as possible.

7.7.2 The temperature in the center of the food product should be reduced from 60°C to 10°C in less than two hours; the product should then be immediately stored at 4°C.

Note: Epidemiological information indicates that the most important factors contributing to the occurrence of food-borne disease outbreaks are related to operations that follow cooking; for instance, if cooling is far too slow, so that any part of the food stays for a dangerously long time in the temperature range between 60°C and 10°C where harmful micro-organisms may grow; therefore, the product should not be maintained in this temperature range for more than 4 hours. Hazard analysis must assess conditions of chilling.

7.7.3 As soon as the chilling is complete the products should be put into a refrigerator. The temperature should not exceed +4°C in any part of the product and should be maintained until final use. Regular monitoring of the storage temperature is necessary.

7.7.4 The storage period between the preparation of chilled food and consumption should not be longer than five days including both the day of cooking and the day of consumption.

Note: The storage period of five days is directly related to the storage temperature of +4°C.

7.8 Freezing Process and Storage Conditions of Frozen Food

7.8.1 Immediately after preparation freezing should be carried out as quickly and efficiently as possible.

7.8.2 Cooked-frozen foods should be kept at or below -18°C. Regular monitoring of the storage temperature is necessary.

7.8.3 Cooked-frozen foods can be stored at or below 4°C but for not more than five days and should not be refrozen.

7.9 Transport

7.9.1 Hygienic requirements inside vehicles transporting cooked and precooked foods are also applicable.

7.9.2 During transport the food should be protected against dust and other pollution.

7.9.3 Vehicles and/or containers intended for transporting heated food should be designed to maintain food at at least 60°C.

7.9.4 Vehicles and/or containers intended for transporting cooked-chilled food should be appropriate for this transport. The transport vehicle is designed to maintain the temperature of the already chilled food and not to chill the food. The temperature of the cooked-chilled foods should be maintained at 4°C but may rise to 7°C for a short period during transport.

7.9.5 Vehicles and/or containers intended for transporting cooked-frozen food should be appropriate for this transport. The temperature of the cooked-frozen food should be maintained at or below -18°C, but may rise to -12°C for a short period of time during transport.

7.10 Reheating and Service

7.10.1 Reheating the food should be carried out rapidly. The reheating process must be adequate: a temperature of at least 75°C should be reached in the centre of the food within one hour of removing the food from refrigeration. Lower temperatures may be used for reheating providing the time/temperature combinations used are equivalent in terms of destruction of microorganisms to heating to a temperature of 75°C.

Note: Reheating must also be rapid so that the food passes quickly through the hazardous temperature range between 10°C and 60°C. This will usually require the use of forced air ovens, infrared or microwave reheaters. The temperature of the heated food should regularly be checked.

7.10.2 The reheated food should reach the consumer as soon as possible and at a temperature of at least 60°C.

Note: To minimize the loss of the organoleptic properties of the food it should be kept at or above 60°C for as short a time as possible.

7.10.3 Any food not consumed should be discarded and neither reheated nor returned to chilled or frozen storage.

7.10.4 In self-service establishments the serving system should be such that the foods offered are protected from direct contamination which could result from the proximity or the action of the consumer. The temperature of the food should be either below 4°C or above 60°C.

7.11 Identification and Quality Control System

7.11.1 Each container of food should be labelled with the date of production, type of food, establishment name and lot number.

Note: Lot identification is essential for implementing any product recall which may be required. It is also required to enable the "First-in/First-out Principle" to be implemented.

7.11.2 Quality control procedures should be carried out by technically competent personnel who possess an understanding of the principles and practice of food hygiene, a knowledge of the provisions of this code and who employ the HACCP approach in the control of hygienic practice.

Note: The control of temperature and time at critical control points is the key to producing a sound product. Access to a food microbiology laboratory is useful in establishing the validity of the procedures instituted. Occasional checking at critical control points serves to monitor the continuing efficacy of the management systems.

7.11.3 Where appropriate for safety a sample of at least 150 g of each item of food taken from each lot should be kept in a sterile contained at 4°C or below until at least three days after that whole lot has been consumed. Some organisms do not tolerate freezing and thus refrigeration of samples is recommended in lieu of freezing. The sample should be obtained from the lot at the end of the portioning period. These samples should be available for investigation in the event of any suspected food-borne disease.

7.11.4 The health authority will need for its own purposes a record of the catering establishments for which it is responsible and a registration scheme seems most appropriate.

PROPOSED DRAFT GUIDELINE PROCEDURES FOR THE VISUAL INSPECTION OF LOTS OF CANNED FOODS FOR UNACCEPTABLE[1] DEFECTS
(At Steps 5 & 8 of the Procedure)

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[1] Unacceptable defects are those which show visual evidence that a metal container is without hermetic seal or that microbial growth has occurred in the container's contents (see Appendix 2).

EXPLANATORY PREFACE

The safety of canned foods is assured primarily by the application of Good Manufacturing Practices (GMP's) in the manufacture of the containers, processing and handling the container in the processing establishment, and storage and distribution of the finished product. When the safety or acceptability of a lot of canned food is in question the first action should be the verification that GMP's were followed. However, there are instances e.g., international trade, when safety or acceptability of a lot may be in question and no evidence is available which would give assurance that GMP's had been followed. In such situations it would be appropriate for a canning expert to assess the acceptability or safety by both inspection and reference to any pertinent documentation relating to processing, shipping, etc. of the lot which may be available. The type of examination carried out under such circumstances will vary and be dictated by the particular problem or situation. The examination may be expected to reflect the experiences of the particular expert engaged.

Some container defects can increase the potential for microbiological contamination of canned foods resulting in spoilage and in some instances in foodborne illness. While some of these defects are hidden, many are visible on the container surfaces permitting their detection without destructive analysis. Control of such defects, that is preventing their occurrence, is exercised in a number of critical control points in the GMP's to assure that the risk of post-process microbial contamination which may result in spoilage and food poisoning is minimized. It is in this sense that inspection of lots of canned foods for visual defects can be a viable means to determine their acceptability. Since such inspection is non-destructive it permits the inspection of larger numbers of containers at minimal cost. However, when such inspections are carried out, only statistical based sampling plans should be used and the choice of sampling plan depends on the nature of the inspection being undertaken.

It is important to recognize that sampling inspection for defects alone cannot give the same level of assurance to GMP's because:

1. not all defects are apparent by visual inspection; and
2. there are limitations on resources available for the application of statistically based sampling plans.

Control of visual defects is just one of the GMP's relevant to assuring that the risk of contamination with microorganisms which may result in spoilage and food poisoning are minimized. From this, it is clear that sampling plans need to be considered in relation to their intended purpose and to the acceptable and unacceptable defects.

End-product examination for visual defects should not be over emphasized as it may divert attention away from those GMP's which cannot be monitored by end-product examination (see Codex Alimentarius Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods, CAC/RCP 23-1979 (Rev.1, 1989)).

Sorting may be appropriate to remove defective cans but this should be decided at the "retention" stage by a person with experience in the evaluation of defective cans.

IT IS MOST IMPORTANT THAT SAMPLING INSPECTION OF LOTS OF CANNED FOOD FOR THE PRESENCE OF VISUAL DEFECTS IS NOT THE ONLY BASIS FOR JUDGING PRODUCT TO BE FIT FOR HUMAN CONSUMPTION

1. INTRODUCTION

The container defects named and illustrated in the manual and listed in Appendix 2, should be obvious and render the container or its contents defective, that is not suitable for distribution and sale. Anyone with a minimum of training should be able to recognize and intercept containers with these defects and to remove them from the food distribution chain. Expert advice should then be sought on the acceptability of the remainder of the lot (see also the Codex Guidelines for the Salvage of Canned Foods Exposed to Adverse Conditions).

The external defects listed in Appendix 2 and illustrated in the manual as unacceptable defects, are those which show visual evidence that a metal container is without a hermetic seal or that microbial growth has occured in the containers contents. These represent only one extreme of a whole range of visual defects which may be found in metallic containers. Provisions should be made to ensure that an inspector can differentiate between those shown in the manual as unacceptable defects and other defects that may be found in the course of an inspection.

The safety of canned foods is most properly assured through strict adherence to Good Manufacturing Practices as detailed in the Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods, CAC/RCP 23-1979 (Rev.1, 1989), at the time of can manufacture, canning, storage and shipping. The inspection of a sample from a lot of finished product can provide only limited assurance of safety, since its main goal is to obtain a measure of the lot quality with respect to defectives and is mot suited to the examination of shipments of unknown history. What action, if any, that should be taken would depend upon the quantity and type of defectives found and/or upon prevailing requirements of the regulatory agency having jurisdiction.

2. OBJECTIVE

This guide is intended for use by those charged with the responsibility for the visual inspection of lots of canned foods for unacceptable defects which are depicted in the pictorial manual and listed in Appendix 2. This guide is not intended to be used to determine the disposition of a lot of canned food.

3. INSPECTOR

The term inspector applies to anyone who is charged with the responsibility to inspect a lot of canned foods for container defects and is not confined to those from regulatory agencies.

3.1 Training

Inspectors should be trained in the techniques required for the inspection of canned foods for container defects, with particular reference to the detection and identification of unacceptable defects as depicted in the manual and listed in Appendix 2.

3.2 Powers

Inspectors should have the authority to exercise control over a lot until inspection, including evaluation of the results, is complete. Inspectors should also have the authority to control the disposal of defective cans and the entire lot if it is deemed unacceptable for sale.

4. INSPECTION

4.1 Preparation for Inspection

The inspector should be given all pertinent information on the lot(s) designated for and prior to the sampling for inspection, for example:

- Location of the lot(s);
- lot size (number of cartons and number of containers/carton);
- food type (peas, beans, luncheon meat, etc.);
- type and size of can;
- list of codes in the lot(s) and number of cartons in each;
- processor, country of origin, legal agent, etc.;
- sampling plan.

In order to properly sample an inspection lot and examine cans, all cans in the lot should be accessible. Adequate space and illumination should be available at the site of the inspection. As some defects are difficult to observe with the naked eye a magnifying glass (3x to 5x) and a high intensity light source are useful for the examination of the container surface and the label. The reference defect manual should be available for consultation to ensure that defects are correctly identified. Adequate assistance should be available to the inspector so that he may have access to the entire lot for sampling.

The inspector should be informed as to the information, observations and sampling plan that are required for the inspection. A specific form or check list which details the information required and with sufficient space to record observations is an excellent means to ensure that the necessary information and observations are acquired and recorded. An example of a check list is given in Appendix 1.

4.2 Overview Inspection

The lot(s) should be examined visually for the presence of damaged, wetted or stained cartons. To properly conduct this overview inspection, as many of the cartons as possible should be exposed to view. It is not possible to conduct a proper overview when the lot(s) are contained in a truck, boxcar or shipping container as only those cartons facing the doors are exposed for examination.

Any damaged, wetted or stained cartons should be separated from the lot for a more detailed inspection. It should be kept in mind that the wetting or staining of cartons can often be the result of leakage of cartons immediately above which may not show any visible signs of leakage.

The number of damaged, wetted or stained cartons which are separated from the lot should be recorded as well as the location to which they have been removed. Precautions should be taken to prevent their inadvertent removal until they have been satisfactorily inspected and their fate determined. When there is obvious forklift or transportation damage, the inspector may permit removal of the damaged containers without prejudicing the evaluation of the remainder of the lot, provided the damage is not a prevailing condition throughout the lot. This would also apply to lots not selected for examination where similar conditions prevail. If can damage is not due to handling, refer to actions in Section 6.

Any damaged, wetted or stained cartons previously separated from the lot during the overview inspection may be sorted separately and given a 100% inspection to identify the unacceptable defects present.

5. SAMPLING INSPECTION

The lot(s) should be sampled in accordance with a designated sampling plan. The sampling plan(s) used should be recorded.

Statistically based sampling plans call for a random selection of the sample units in the sample. For inspections, all items in the lot should be accessible and every effort should be made to ensure that the sample obtained is representative of the lot. It is important that the method used to obtain the sample is recorded as it may have an impact on the evaluation of the results. Where the lot has very limited access, the inspector would well be advised to seek guidance.

Frequently lots of canned foods can contain more than one code lot. In such cases and prior to sampling it should be determined whether each code lot will be sampled separately and what sampling plan will be used for each.

Each sample unit should be identified so that any defects found can be related to a particular unit. The number of sample units taken should be recorded.

5.1 Examination of Sample

When the required number of cans has been selected they should be carefully examined for defects. The first step is to carefully observe the overall external appearance of the cans, paying particular attention for any signs of swelling or leakage. The latter may be evidenced by the presence of product on the can or staining of the label. The label should be removed from a suspect can after its position has been marked. This allows for easier location of a defect on the can. All parts of the can should be carefully examined with particular attention being paid to seams, areas of embossing and tear away strips, if present.

Each sample unit found to have any of the unacceptable defects as shown in the manual should be recorded. All defects observed for each sample unit should be recorded. In the event that an inspector is uncertain of a defect, he should seek a second opinion from an expert.

6. ACTION WHEN DEFECTS ARE FOUND

When an inspector finds any defect shown in the manual he should either notify his superior or follow established procedures which set out criteria regarding the action to be taken. It may be appropriate to retain the lot and send defective cans to a laboratory for further investigation. It is important to remember that the individual cans which have unacceptable defects may represent a health hazard and proper care should be exercised in handling, shipping or disposing of such cans. All defective cans should remain under control until destroyed.

Appendix 1

LOT INSPECTION RECORD

Information on Lot

1. Owner or consignee (name and address)
2. Location of lot
3. Manufactured by/for (name, address and establishment No., if appropriate)
4. Transportation (type and duration)
5. Date of arrival
6. Number of cartons
7. Number of containers per carton
8. Product: brand name; and common name (include style if appropriate)
9. Secondary packaging
10. Type and size of container
11. Code lots present (include cartons per code if available)
12. Code interpretation (if available)
13. Details of any accompanying documentation
14. Has lot been salvaged?
15. Is lot part of a larger lot or consignment?
16. If yes, where is remainder of lot or consignment located?

Information on Inspection

1. Date of inspection
2. Inspector's name, address and agency or affiliation
3. Sampling plan used
4. Method by which sample was taken
5. Was it possible to sample freely?
6. Number of containers (sample units) in the sample taken
7. How were sample units identified?
8. List all defects found for each container and note which are unacceptable defects
9. List containers sent to laboratory for further examination
10. Results of laboratory analysis
11. Other comments or observations related to the inspection

Information on Disposition

1. Lot accepted or detained
2. How were defective (unacceptable) containers disposed of?
3. If lot retained, what further action is recommended or has been taken?

Appendix 2

UNACCEPTABLE DEFECTS

The following defects are considered to comply with the definition given for unacceptable defects:

1. Perforated external corrosion
2. Severe body denting (plate fracture with leakage evident)
3. Severe double seam denting (fracture evident)
4. Defective side seam weld (wild burn through)
5. Defective side seam weld (wild blow out)
6. Incomplete side seam weld
7. Incomplete open side seam weld (leakage evident)
8. Mislocked side seam
9. Body puncture
10. Body perforated
11. Hard swell or buckle swell or blown
12. Cable-cut (end plate cut through, leakage evident)
13. Sharp embossed code (end plate fractured)
14. Deadhead or skidder
15. Incomplete double seam (2nd operation incomplete)
16. Cut-over or cut-through (plate fractured)
17. Torn flange (visible hole)
18. Knocked down curl
19. Knocked down flange
20. Torn back curl
21. Score line fracture

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR REFRIGERATED PACKAGED FOODS WITH EXTENDED SHELF LIFE
(at Step 3 of the Procedure)

Table of contents

Proposed Draft Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf life (at Step 3 of the Procedure)

SECTION I - SCOPE

This code concerns the prescriptions for hygiene that must be observed during processing, packaging, storage, distribution and sale of refrigerated prepared foods as defined. [It does not apply to canned food, cheese, milk based desserts, prepared, fermented or cured meat products or cooked and pre-cooked food in institutional food services.]

SECTION II - DEFINITIONS

For the purposes of this code, the following terms and expressions are defined as follows:

2.1 Adequate: Sufficient to accomplish the intended purpose of this code.

2.2 Cleaning: The removal of soil, food residues, dirt, grease or other objectionable material.

2.3 Contamination: The presence 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 microorganisms to a level that will not lead to harmful contamination of food.

2.5 Establishment: Any building(s) or area(s) in which food is handled after harvesting and the surroundings under the control of the same management.

2.6 Food Handling: Any operation involving the transfer of raw materials and finished or semi-finished products.

2.7 Manipulation: Any operation during which, for the manufacture of refrigerated meals, the personnel must touch the food directly or with utensils.

2.8 Food Hygiene: All measures necessary to ensure the safety, soundness and wholesomeness of food at all stages of its growth, production or manufacture, until its final consumption.

2.9 Container: Any wrapping or receptacle in direct contact with the food product.

2.10 Hermetically Sealed Container: Closed container designed to protect the contents against the entry of microorganisms and their spores.

2.11 Primary Packaging: Operation which consists of placing the food product in a container followed by its closure.

2.12 Secondary Packaging: Any wrapping or covering for the containers. Any operation consisting in placing the containers in a package.

2.13 Materials for Containers or Packages: Materials such as cardboard, paper, glass, plastic film, metal and so on, used in the manufacture of containers or packages.

2.14 Lot: Set of units of refrigerated meals produced under the same conditions during a given manufacturing period.

2.15 Pests: Any animals capable of directly or indirectly contaminating food.

2.16 Partitioning: Portioning and packaging of refrigerated meals immediately before or after cooking or quick cooling.

2.17 Rapid Cooling: Lowering of the food temperature under conditions such that passage through the critical zone for microbial proliferation (60°C-10°C) takes less than two hours. Cooling should then be continued under refrigeration in order to bring the food down to the recommended temperature as rapidly as possible.

2.18 Modified Atmosphere: Packaging of the product in an atmosphere other than air (vacuum or gas packaging.)

2.19 Shelf-life: Maximum period of time between the manufacturing of a product and its consumption.

2.20 Expiry Date: Date at which the shelf-life of a product ends.

2.21 Refrigerated Prepared Foods are foods in hermetically sealed containers which have been subjected to a treatment sufficient to achieve a declared shelf life of greater than five days under refrigerated conditions prior to use by the final consumer.

SECTION III - HYGIENE REQUIREMENTS IN THE PRODUCTION/HARVESTING AREA

These provisions are not dealt with in this code; for prescriptions regarding raw materials, see Section VII.

SECTION IV - ESTABLISHMENT: DESIGN AND FACILITIES

This section deals with the areas where food is prepared, cooked, cooled, frozen and stored.

Prevention of contamination requires that every measure be taken to avoid direct or indirect contact of the food with sources of potential contamination.

From the design through to the construction of a facility the following fundamental principles should be respected:

- "forward movement": logical progress of the product through successive processing operations

- separation of the clean lines (processed foods) from the dirty lines (unprocessed foods)

- strict delineation in the facility of "clean" and "dirty" areas

- ease of cleaning, disinfection and maintenance of the equipment and facilities.

The following should also be taken into account when designing the facilities:

- the types of products manufactured and the technology used,

- the quantities that are to be manufactured.

When facilities are to be approved by regulatory bodies, these bodies should be associated with the project for advisory purposes and agreement in principle from the design phase onward.

Facilities in the process of construction should be checked regularly to ensure that work is being done properly and in accordance with specifications.

4.1 Location

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

4.2 Roadways and areas used by wheeled traffic

Access roads 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. They should include an appropriate drainage system and provision 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. Construction materials used should not permit the transmission of undesirable substances to the food. The interior height from floor to ceiling should be at least 2.5 m.

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

4.3.3 The layout should be such as to allow easy and adequate cleaning and to facilitate proper supervision of food hygiene.

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 and dust.

4.3.5 Buildings and facilities should be designed to provide separation, by partition, location or other effective means, between those operations that may cause cross-contamination. They should also be designed so that the principle of "forward movement" can be followed.

In addition, storage facilities, in particular, should permit the "forward movement" and "first in & first out" principles to be followed and be planned according to the temperature, humidity and ventilation required to maintain raw materials, finished and semi-finished products in optimum condition.

The design of unpacking and unwrapping areas for raw materials and ingredients should be based on a detailed study of these types of work areas and include evacuation specifications. Waste, inedible material and all operations likely to present a risk of food contamination, such as preparation, trimming, cutting and washing of materials and utensils, should be done in separate rooms or in areas specially designed for this purpose.

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 materials at the premises to the finished product and that the respective ambient temperatures are appropriate to the process and the product.

Rooms should be designed and equipped so that the inside temperature is such that product temperatures are maintained at a level which inhibits or minimizes the proliferation of bacteria during the various operations, regardless of outside temperatures. Their design should allow for work to be organized in such a way that the products are kept in the critical temperature zones only for the time strictly needed to perform the operations.

To meet temperature requirements imposed air conditioning may be necessary.

4.3.7 In areas where food is manipulated and handled:

- Floors should be of waterproof, non-absorbent, washable, non-slip materials. They should be free of crevices and easy to clean and disinfect. They should slope sufficiently to enable liquids to run off through trapped outlets.

- Walls should be constructed of waterproof, non-absorbent and washable materials. They should be light-coloured and sealed so as not to harbour insects and bacteria up to an appropriate height (at least 1,75 m) for operations areas.

Their surface should be smooth, free of crevices and easy to clean and disinfect. 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 and dirt and minimize condensation, mould development and flaking, and should be easy to maintain.

- Windows and other openings particularly those for ventilation 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 their use as shelves.

In rooms where food is manipulated the air should be filtered and a slight overpressure maintained to reduce the risk of contamination of the food.

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

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

4.3.8 In food handling and manipulation 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 onto the products, and should not hamper cleaning operations. They should be insulated where appropriate and be designed and finished so as to prevent the accumulation of dirt and 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 not open directly onto, food handling areas.

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

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

4.3.12 Water supply

An ample supply of water, in compliance with vol. 1 of the WHO "Guidelines for Drinking Water Quality", 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.

> Note: Sampling should be done regularly; its frequency, however, will depend on the origin and use of the water. Sampling would be more frequent, for example, in the case of a private as opposed to a municipal water supply. In accordance with test results, chlorine or other disinfectants might have to be used to eliminate bacteria. In the case of chlorination, the free chlorine should be determined daily by means of chemical tests. The point of sampling should preferably be located at the point of use; however, it would be useful to take other samples from time to time at the point of entry of the water into the establishment.

A system should be provided to ensure a sufficient supply of hot potable water.

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

Steam used in direct contact with food or surfaces in contact with food should contain no substances which may be hazardous to health or contaminate the food.

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

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 supervision. Alternately, recirculated water which has received no further treatment may be used in situations where its use would not constitute a health hazard and it will not contaminate either the raw materials or the end product. It 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.

4.3.13 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. All evacuation pipes should be connected to the sewers and equipped with traps.

4.3.14 Refrigeration: Establishments should be equipped with refrigerated storage or freezers big enough to contain raw materials at an adequate temperature in compliance with the provisions of Sections 7.1.4 and 7.1.5.

Establishments should also have facilities for rapid cooling and adequate cold storage sufficient to chill and hold a quantity of prepared food corresponding to the maximum daily production of the establishment. The cells must comply with the provisions of Section 7.7 and 7.8.

> Note: Rapid cooling of large quantities of food requires equipment able to rapidly extract heat from the maximum quantity of food likely to be produced. The method used must provide the assurance that foodstuffs do not remain for extended periods in the 10°C to 60°C range because at these temperatures micro-organisms multiply quickly. The performance of the equipment should be checked periodically to ensure that it is functioning according to specifications. To prevent cross-contamination of prepared foods inside the cold rooms by pathogenic agents from raw products, especially meat, fowl, egg-based liquid products, fish and seafood, raw foods should be rigorously isolated from prepared food, preferably by means of separate refrigerated areas.

4.3.15 Changing Facilities and Toilets

Adequate, suitable, and conveniently located changing facilities and toilets should be provided in all establishments. Toilets should be designed so as to ensure proper hygienic removal of waste matter. These areas should be well illuminated, ventilated, and where appropriate, heated. They should not open directly on to food handling areas. Hand-washing facilities with warm or hot and cold water, suitable one-time use of 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.

4.3.16 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 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.

4.3.17 Disinfection Facilities

Where appropriate adequate facilities for cleaning and disinfection of implements and equipment used for food manipulation 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.

4.3.18 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 at all inspection points
220 lux in work rooms
110 lux 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.

4.3.19 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. The air in food-handling zones should be filtered and maintained at slightly elevated pressures.

In rooms where food is manipulated, temperatures should not rise above 18°C. It is important that the exposure of foods which require refrigeration in rooms or areas where the ambient temperature is such that would permit rapid growth of pathogenic microorganisms be kept as short as possible.

4.3.20 Facilities for Storage of Waste and Inedible Materials

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

4.4 Equipment and Utensils

4.4.1 Materials

All equipment and utensils used in food handling and manipulation areas which may come into contact with food should be made of material which does not transmit toxic substances, undesirable odour or taste, is non-absorbent, resistant to corrosion and capable of withstanding repeated cleaning and disinfection. Surfaces should be smooth and free of pits and crevices. Among appropriate materials are stainless steel and artificial rubber. 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 metals in such a way that contact corrosion can occur should be avoided.

Note: Equipment and utensils are potential sources of cross-contamination. They should not be used indiscriminately for raw and cooked food. In addition to ordinary cleaning, it is essential that all equipment and utensils used for raw food be carefully disinfected before being used for cooked or pre-cooked food.

4.4.2 Sanitary Design of Equipment

All equipment and utensils should be designed and constructed so 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.

Containers for inedible matter and waste should be leak-proof, constructed of metal or other suitable impervious materials, should be easy to clean or disposable and should close tightly.

All refrigerated spaces should be equipped with temperature measurement or recording devices. These devices should be clearly visible and placed in such a way as to register as accurately as possible the maximum temperature of the refrigerated areas.

Note: Temperature-measuring devices should be checked regularly for accuracy.

4.4.3 Equipment Identification

Equipment and utensils used for inedible materials or waste 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 of steam, vapour and residual 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 Appendix I of General Principles of Food Hygiene (CAC, Vol. A, 1st edition).

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

Note: Equipment, utensils, etc. that are in contact with food, especially raw food (fish, meat, vegetables) will be contaminated by microorganisms. There is an inherent risk of affecting other products that will be manipulated later. It is therefore necessary to clean the equipment and, when appropriate, dismantle it at frequent intervals during the day, at least after each break and when changing from one food product to another. Dismantling, cleaning and disinfection at the end of the work day are aimed at preventing the proliferation of potentially pathogenic flora. Control should be exercised through regular inspections.

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 appropriate for the intended purpose and should be approved by the official agency having jurisdiction. Any residues of these agents on a surface which may come in contact with food should be removed by effective means such as rinsing with potable water or rinsing and drying with steam before the surface or equipment is again used for manipulating food.

5.2.4 Either immediately after cessation of work for the day or at such other times as may be appropriate, floors, including drains and orifices for the evacuation of liquid wastes, auxiliary structures and walls of food 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 Program

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 materials are designated for special attention. A single

individual, who should preferably be a permanent member of the management of the establishment and whose duties preferably should be independent of production, should be appointed to be responsible for the cleanliness of the establishment. He or 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 By-products from raw materials

By-products such as trimmings, peelings, discards, etc., not classed as waste material and which may have some future use should be stored in a manner to avoid contamination of food and permit their conservation. They should be removed from the work zones as often as is necessary.

5.5 Storage and Disposal of Waste

In rooms where refrigerated meals are prepared and cooked, waste materials should be placed in containers specially designated for this purpose. These should be sealed or equipped with a cover and taken out of the work area as soon as they are full or after each work period and placed in covered garbage containers that are never to be brought into the processing areas. Reusable containers should be cleaned and disinfected every time they are returned to the processing areas.

Waste containers should be kept in a closed area reserved for this purpose, away from food storage areas. The area should be kept at the lowest temperature possible, and should be well ventilated and protected against insects and rodents: it should be easy to clean, wash and disinfect. Waste receptacles should be cleaned and disinfected after each use.

As soon as they have been emptied, cartons and packaging should be treated in the same way as waste matter. Waste-compression equipment should be kept separate from areas where food is handled.

If a system of waste evacuation through a duct is installed, it is essential that all waste materials and other types of rubbish be placed in closed disposable bags. Duct openings should be cleaned and disinfected every day.

5.6 Exclusion of Domestic Animals

Uncontrolled animals or those representing a possible health hazard should be excluded from establishments. No animal should be present in food handling areas.

5.7 Pest Control

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

> Note: It has been established that insects and rodents are vectors of pathogenic bacteria between contaminated areas, prepared food and surfaces that are in contact with food. Consequently, their presence should be prevented in food preparation areas.

5.7.2 When 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 under the 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 in the product. Such measures should only be carried out in accordance with the recommendations of the official agency having jurisdiction.

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 prior to being used again.

5.8 Storage of Hazardous Substances

5.8.1 Pesticides or other substances which may present 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. Extreme care should be taken to avoid contaminating food.

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.

5.9 Personal Effects and Clothing

Personal effects and clothing should not be left in food handling areas. They should be kept in the changing facilities described in Article 4.4.15.

SECTION VI - PERSONNEL HYGIENE AND HEALTH REQUIREMENTS

6.1 Hygiene Training

The state of health, dress and behaviour of personnel being of major importance in matters of hygiene, every effort should be made to motivate food handlers in this area. With this aim, managers of establishments should arrange for adequate and continuing training of and supply of pertinent information to every food handler in hygienic handling of food and in personal hygiene so that he or she understands the precautions necessary to prevent contamination of food. Training should include relevant parts of this code, begin with the hiring of an employee and be repeated regularly. Its content should be written down, possibly illustrated and easy to consult by personnel. Permanent displays of hygiene requirements are advised.

6.2 Medical Examination

The establishment's management should require that persons who come in contact with food in the course of their work 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 future employee. A medical examination should also be done every time that it is necessary for clinical or epidemiological reasons, especially following an interruption of work caused by a disease that may have after-effects likely to cause contamination of any food that is handled. A regular checkup (once a year at least) is strongly advised.

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 suffering from infected wounds, skin infections, sores or with diarrhoea, can directly or indirectly contaminate food. For this purpose the following measures should be taken:

- be on the watch for sick or infected employees

- bar affected persons from food handling for the period during which they present a potential danger

- in special cases, such as health asymptomatic carriers, they may be permitted to work as long as extra precautions are taken.

Any person who knowingly presents a risk of this type should immediately notify the management.

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 conspicuous. The person should also wear gloves to ensure effective protection. Adequate first-aid facilities should be provided for this purpose.

6.5 Washing of Hands

Every person working in a food handling area should wash his or her hands frequently and thoroughly with a suitable hand cleaning and disinfection preparation under running, warm, potable water. Hands should always be washed before commencing work, immediately after using the toilet, after handling contaminated materials 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 whose work involves food handling 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 be washed in an appropriate area. During periods in which food is manipulated by hand, all jewellery should be removed from the hands. Personnel should not wear any insecure jewellery when engaged in food handling.

6.7 Personal Behaviour

Any behaviour, such as eating, use of tobacco, chewing (for example, gum, pretzels, betel nuts, etc.) or unhygienic practices such as spitting, which could result in contamination of the food 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.

Note: Gloves can be used to protect the employee from the product to be handled and make food handling more hygienic. Gloves with holes in them or that are torn should be thrown away to avoid any leakage of accumulated sweat that may deposit large numbers of microorganisms on the food. Metal mesh gloves are particularly difficult to clean and disinfect because of their texture. Careful cleaning is required followed by heating or prolonged immersion in disinfectant.

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 Sections 5.8, 6.3 and 6.7 of this code.

6.10 Supervision

Responsibility for ensuring compliance by all personnel with all the requirements of Sections 6.1 through 6.9 should be specifically allocated to competent supervisory personnel.

SECTION VII - ESTABLISHMENT: HYGIENIC PROCESSING REQUIREMENTS

7.1 Raw Materials Requirements

7.1.1 No raw materials or ingredients should be accepted by the establishment if they are known to contain parasites, microorganisms, toxins, decomposed or extraneous substances which will not be reduced to acceptable levels by normal plant procedures of sorting, preparation or processing.

7.1.2 Specifications should be established in concert with the raw material and ingredient suppliers which will ensure that the finished products will comply with any regulatory requirements and 7.1.1.

These specifications should also address required label information, packaging and conditions of transport as well as the microbiological attributes.

The specifications should also take into consideration the process technology and the processing conditions to which the raw materials and ingredients will be exposed.

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 conducted. These tests may include:

- Visual inspection for foreign matter.

- Organoleptic evaluation; odour, appearance, possibly taste.

- Microbiological tests: systematic monitoring for microbiologically sensitive materials, periodic monitoring for less sensitive materials.

These tests or inspections should refer either to national regulations, international standards or recommendations, or established methods agreed to with the supplier.

7.1.4 Raw materials should be stored in suitable areas to assure their preservation as soon as possible after reception. Perishable raw materials should be placed in cold storage at the proper temperature without delay.

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.

7.1.5 Storage temperatures

Raw foodstuffs of animal origin should be stored at temperatures between 1°C and 3°C. Other refrigerated food such as prepared vegetables should be stored at temperatures below 7°C. Temperatures should be checked at least once a day and records kept.

> Note: Raw material stocks should be properly rotated, i.e., first in - first out. Those bearing an expiry date must be used before that date. The age of a product, however, is only one indication of its quality. The antecedents of raw materials must be taken into account, whether because of the intrinsic quality of the materials or the temperatures to which they were exposed, so that different lots can be used in the proper order. Refrigerated raw materials should ideally be stored at a temperature that is as low as possible without reaching freezing point. Common human foodborne pathogens can multiply, albeit slowly, at refrigeration temperatures. Yersinia enterolitica multiplies very slowly at 1°C, Clostridium botulinum type E at 3.3°C and Listeria monocytogenes at as low as -1°C.

7.1.6 Frozen or deep-frozen raw materials that are not used immediately should be maintained or stored at temperatures equal to or less than -18°C.

7.2 Prevention of Cross-Contamination

7.2.1 Effective measures should be established and taken to prevent contamination of food materials by direct or indirect contact with potential contamination sources or vectors. Suitable procedures should be identified. Raw food materials in particular should be well separated from cooked or pre-cooked food.

> Note: Raw meat, poultry, raw eggs, fish, molluscs and rice are prone to contamination by foodborne pathogens. Poultry, for example, often contains Salmonella, which may be transferred to employees' hands, equipment surfaces and other materials. The possibility of cross-contamination must always be considered.

7.2.2 Persons handling raw materials or semi-processed products likely to contaminate the end products should not touch these finished products unless and until they discard all protective clothing worn by them during the handling of the raw materials or semi-processed products and which have come into direct contact with or has been soiled by raw materials or semi-processed products until they have changed into clean protective clothing and thoroughly washed their hands.

7.2.4 If there is a likelihood of contamination, hands should be washed and disinfected thoroughly before handling products that are at different stages of processing.

> Note: Persons handling food represent a hazard. Cooked ingredients, potato salad for example, can be contaminated by employees assigned to its mixing. The analysis of hazards should therefore include the supervision of personnel from the point of view of sanitary food handling methods, specifically hand hygiene.

7.2.5 Raw products that may present a hazard should be processed in separate rooms, or in areas physically separate from those where food ready for consumption is prepared.

7.2.6 All equipment which has been in contact with raw or contaminated materials should be thoroughly cleaned and disinfected prior to being used in contact with cooked or pre-cooked food. It is preferable to have separate implements for raw materials and semi-finished or finished products, especially for operations involving cutting, slicing and grinding.

7.3 Use of Water in Food Processing

See 4.3.12.

7.4 Processing

7.4.1 Production of refrigerated prepared foods involves a sequence of several distinct operations with the purpose of processing and assembling raw materials into a finished product. It should be supervised by technically competent personnel.

7.4.2 All steps in the production process, including packaging, should be performed without delay and under conditions which will prevent any possibility of contamination, deterioration, or growth of microorganisms. In all stages of processing, critical temperatures at which microorganisms multiply (+ 10°C to + 60°C) should be avoided or at least passed through quickly.

7.4.3 Raw materials of different origins (meat, vegetables, fish, etc.) should be prepared in different areas. If this is not possible, these operations should be performed separately at different times with proper cleaning and disinfection between each operation.

7.4.4 Thawing (Total or Partial)

When thawing (total or partial) independent of cooking (meat carcasses, for example), is required it should be done according to one of the following four techniques, subject to approval by the official agency having jurisdiction.

- In a cold room whose temperature is below +4°C.
- In a potable non-recycling running water maintained at a maximum temperature of +15°C.
- In a micro-wave oven.
- In a enclosed areas specially designed for thawing.

The procedure for thawing should be defined (time, temperature) and strictly controlled by the manufacturer. Time-temperature parameters should be selected so as to avoid conditions favourable to the growth of microorganisms. After thawing, the temperature of the product should be brought back to +3°C. When thawing in micro-wave ovens, the manufacturer's instructions should be scrupulously followed to avoid localized over-heating and non-uniform thawing.

Thawing facilities should be kept perfectly clean.

7.4.5 Thermal Processing (Cooking or Pasteurization)

Thermal processing (cooking or pasteurization) has two effects:

- reduction of the bacterial population quantified by the "pasteurization value";
- changes in the organoleptic and nutritional qualities characterized by the "cooking value".

The intensity of the thermal processing chosen depends on the selected pasteurizing and cooking values. This choice should only be made by specially trained personnel.

Pasteurization Value

In setting the expiry date, only the pasteurizing value attained in the final thermal process should be taken into account, except when totally aseptic packaging procedures are used.

a) Definition of the Pasteurization Value

The pasteurizing value represents the degree to which vegetative forms of bacteria are destroyed. It is therefore a critical element in the definition of processing parameters. This concept is essential to the safety of the product.

b) Reference Microorganism

For the purpose of this code the reference microorganism used in the calculation of the pasteurization value is Streptococcus faecalis.

Experimentally determined D values, defined as the time required to affect a decimal reduction of a specified microorganism at a specified temperature, are used to compare the thermoresistance of various microorganisms. For the purpose of this code, a reference temperature of 70°C has been chosen. To the extent of present knowledge, the most thermal resistant non-spore forming bacterium is S. faecalis having a D_{70} = 2.95 min and a z value = 10°C. The z value is defined as the number of degrees which will cause a one log change in the D value.

c) Destruction Attained (n)

The destruction attained (n) is number of decimal reductions (logs) of population of the reference microorganism by the application of the process. This can be calculated by subtracting the final log concentration of the reference microorganism from the estimated or known original log population as follows:

$$n = \log N_0 - \log N_1$$

where N_0 = initial population, and

N_1 = final population

The initial and the final populations are determined or estimated by the experimenter.

For example, take a case of extensive contamination in which $N_0 = 10^7$ cfu/g, and to ensure adequate safety, N_1 is set at a very low value, say = 10^{-6} cfu/g.

The destruction attained is then equal to:

$$n = \log N_0 - \log N_1 = 7 - (-6) = 13 \text{ log. reductions}$$

d) Method for the Calculation of the Pasteurization Value

The application of a temperature greater than 50°C will cause the destruction of part of the bacterial population.

When a food is heated it passes through a succession of increasing temperatures. At each increase in the temperature the microbial population in the food is reduced with the extent of the reduction being a function of the thermal resistance of the microorganism and the time at which the food remains at each of the successive temperatures.

The thermal resistance of a microorganism is characterised by values of D and z, which are defined as follows:

D = time, expressed in minutes, required to affect a 90% reduction of the microbial population at a specified temperature, and

z = the temperature range, expressed in degrees Celsius, which will effect a 90% reduction in the D value.

Calculation of the partial pasteurization value

Assuming that pasteurization is achieved by a thermal process, the pasteurization value (PV) can be calculated or evaluated for the entire scheduled thermal treatment.

For each temperature above 50°C a partial pasteurization value (PPV) can be calculated using the following formula:

$$PPV = \log^{-1} (Tx - Tr)/z, \text{ where}$$

PPV is equal to the time, expressed in minutes, at a reference temperature (Tr) that would produce the same rate of reduction of a given microbial population as unit time at the applied temperature (Tx). The z value is as described above.

The PPV can be obtained more easily from tables of such values.

Table 1 gives the PPV's from 50°C to 80°C for a microorganism of reference like S. faecalis having a $D_{70} = 2.95$ min and a z = 10°C. From this table it can be seen that, for example, that one minute at 73°C will affect the same rate of destruction as 1.995 minutes at 70°C.

Calculation of the total pasteurization value for a thermal process

The time/temperature sequence of an example thermal process is portrayed in figure 1.

An example of the manner in which the PPV can be used to calculate the total reduction of a reference microorganism is given in Table 2 for the time/temperature sequence given in figure 1.

The values found in the column titled "partial pasteurization value" were obtained from Table 1 for each given temperature.

Table 1

PASTEURIZATION VALUES

°C	TENTHS OF DEGREE									
	0	1	2	3	4	5	6	7	8	9
50	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.012	0.012
51	0.013	0.013	0.013	0.013	0.014	0.014	0.014	0.015	0.015	0.015
52	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.019	0.019	0.019
53	0.020	0.020	0.021	0.021	0.022	0.022	0.023	0.023	0.024	0.025
54	0.025	0.026	0.026	0.027	0.028	0.028	0.029	0.030	0.030	0.031
55	0.032	0.032	0.033	0.034	0.035	0.035	0.036	0.037	0.038	0.039
56	0.040	0.041	0.042	0.043	0.044	0.045	0.046	0.047	0.048	0.049
57	0.050	0.051	0.052	0.054	0.055	0.056	0.058	0.059	0.060	0.063
58	0.063	0.065	0.066	0.068	0.069	0.071	0.072	0.074	0.076	0.078
59	0.079	0.081	0.083	0.085	0.087	0.089	0.091	0.093	0.095	0.098
60	0.100	0.102	0.105	0.107	0.110	0.112	0.115	0.117	0.120	0.123
61	0.126	0.129	0.132	0.135	0.138	0.141	0.145	0.148	0.151	0.155
62	0.158	0.162	0.166	0.170	0.174	0.178	0.182	0.186	0.191	0.195
63	0.200	0.204	0.209	0.214	0.219	0.224	0.229	0.234	0.240	0.245
64	0.251	0.257	0.263	0.269	0.275	0.282	0.288	0.295	0.302	0.309
65	0.316	0.324	0.331	0.339	0.347	0.355	0.363	0.371	0.380	0.389
66	0.398	0.407	0.417	0.427	0.436	0.447	0.457	0.468	0.479	0.490
67	0.501	0.513	0.525	0.537	0.549	0.562	0.575	0.589	0.603	0.617
68	0.631	0.646	0.661	0.676	0.692	0.708	0.724	0.741	0.759	0.776
69	0.794	0.813	0.332	0.851	0.871	0.891	0.912	0.933	0.955	0.977
70	1.000	1.023	1.047	1.072	1.096	1.122	1.148	1.175	1.202	1.230
71	1.259	1.288	1.318	1.349	1.380	1.413	1.445	1.479	1.514	1.549
72	1.585	1.622	1.660	1.698	1.738	1.778	1.820	1.862	1.905	1.950
73	1.995	2.042	2.089	2.138	2.188	2.239	2.291	2.344	2.399	2.455
74	2.512	2.570	2.630	2.692	2.754	2.818	2.884	2.951	3.020	3.090
75	3.162	3.236	3.311	3.388	3.467	3.548	3.631	3.715	3.802	3.890
76	3.981	4.074	4.169	4.266	4.365	4.467	4.571	4.667	4.786	4.898
77	5.012	5.129	5.248	5.370	5.495	5.623	5.754	5.888	6.026	6.166
78	6.310	6.457	6.607	6.761	6.918	7.079	7.244	7.413	7.586	7.763
79	7.943	8.128	8.318	8.511	8.710	8.913	9.120	9.333	9.550	9.773

Figure 1

HEAT PENETRATION

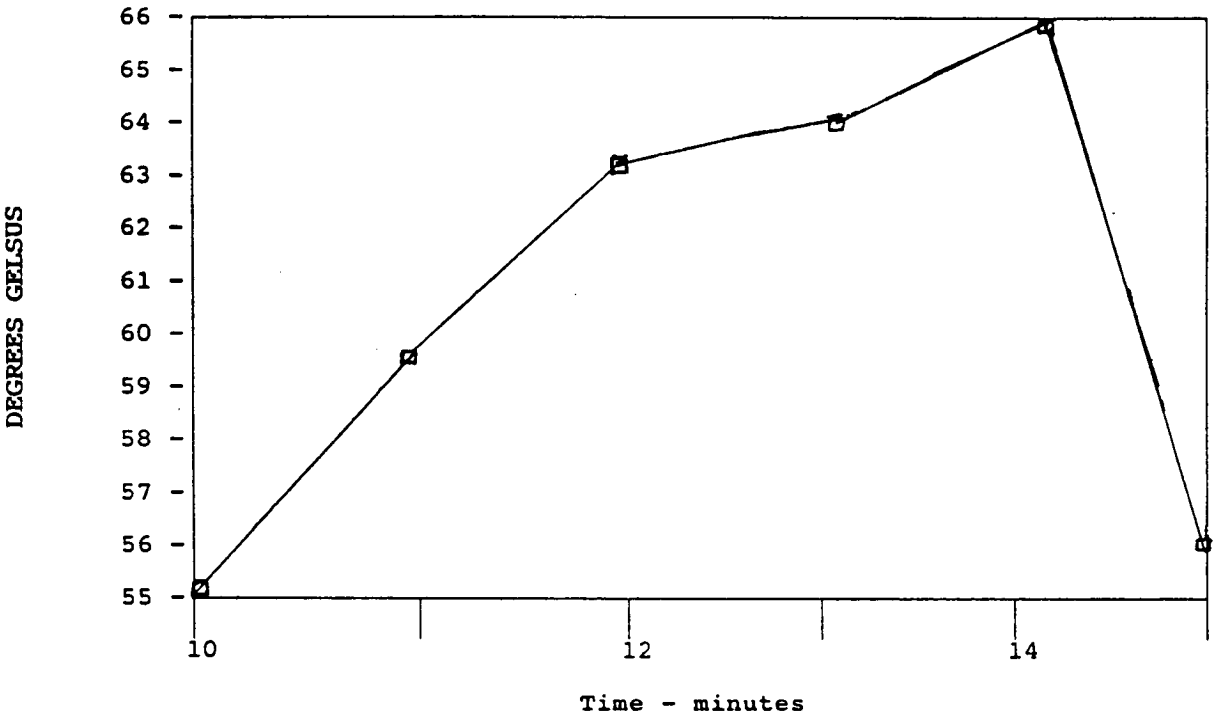


Figure 2

PASTEURIZATION VALUE

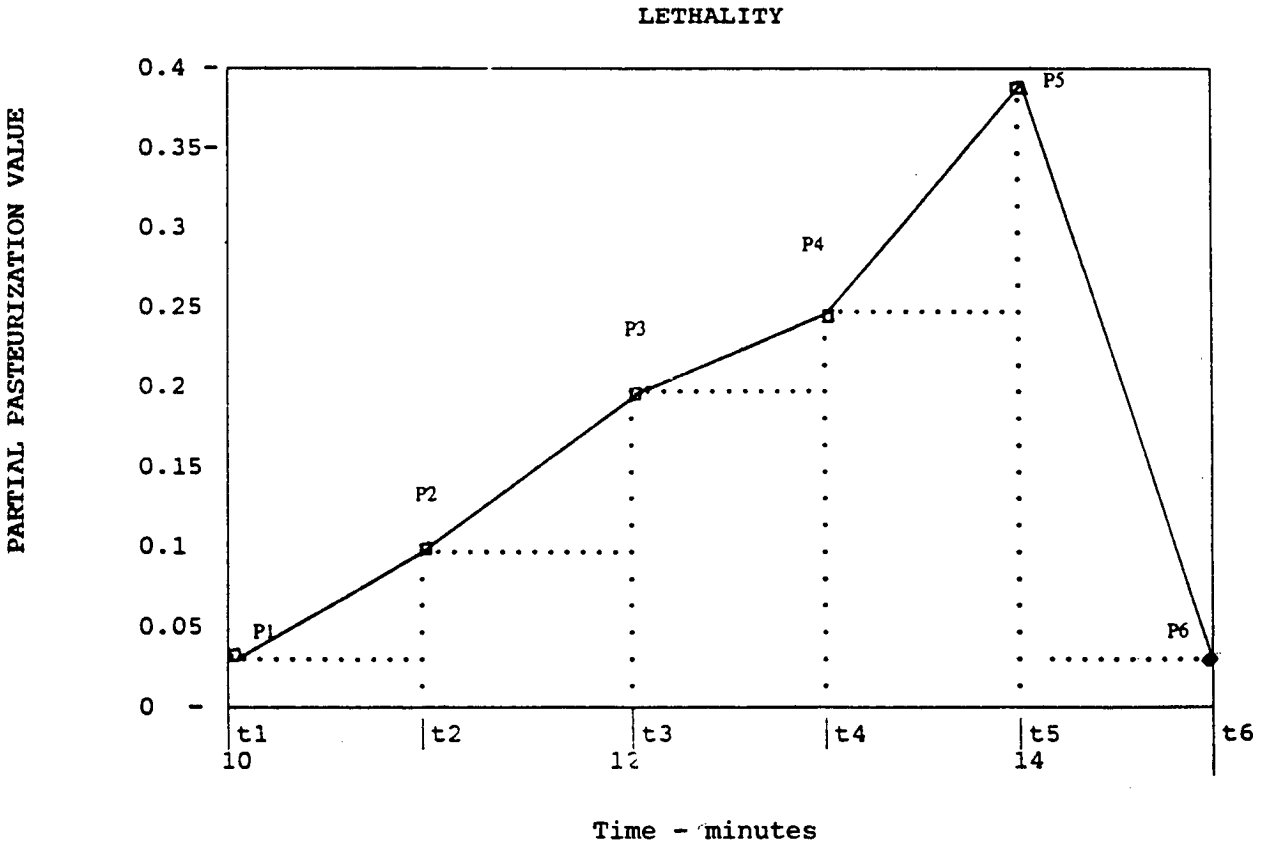


Table 2

Process Time (min.)	Product Temperature °C	PPV	PPV per Time Interval
10	55	0.032	0.0875
11	59.5	0.089	0.0605
12	63	0.200	0.1445
13	64	0.251	0.2255
14	66	0.398	0.3245
15	56	0.040	0.2190
	Total Pasteurization Value		1.0615

The calculation of the total pasteurization value is more complicated. For this, the partial pasteurization values for each temperature are plotted against the process time, (for those from Table 2, see Figure 2) and the area under the curve so formed is determined.

This is called the "General or Graphic Method" and has been extensively used for the determination of the sterilization value for canned foods.

Many methods have been used to calculate the area under such curves. One successful method is as follows.

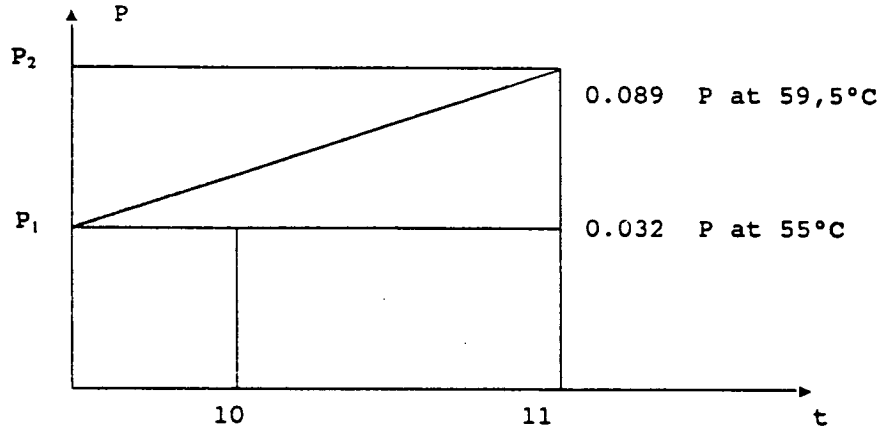
Let the PPV's in Table 2 for the time intervals t_1 to t_6 be represented by P_1 to P_6. The partial pasteurization value for the interval from 10 minutes to 11 minutes can be calculated from the following formula:

$$PV = P_1 (t_2 - t_1) + (P_2 - P_1) \times (t_2 - t_1)/2$$

Substituting the values from Table 2

$$PV = 0.032 \times (11-10) + (0.089-0.032) \times (1 -10)/2$$
$$= 0.0605$$

This is essentially the formula and method for calculation of the figure below.



Thus the pasteurization value achieved during the time from 10 min to 11 minutes as the temperature rose from 55°C to 59 5°C was 0.0605 min.

This calculation can be repeated for each successive time interval, and the values obtained are given in the last column of Table 2.

The total pasteurization value for the process represented in Table 2 is obtained by adding up all the values found in column 4 which gives 1.0615. This is interpreted that the process is equivalent to holding the product at a temperature of 70°C for 1.0615 minutes with respect to the reference microorganism S. faecalis with a D_{70} = 2.95 min and z = 10°C.

The relationship between the total pasteurization value and the reduction of the microbial population:

The D value for S. faecalis at 70°C is 2.95 which means that at that temperature 2.95 minutes are required to affect a decimal reduction in the numbers of that organism.

Therefore, with 1.0615 minutes at that reference temperature of 70°C, the reduction of the original microbial population would be 1.0615/2.95 or 0.36 logarithms. For an original population of 10^6 it would be reduced to 6 - 0.36 = 5.640 log. or 4.37 x 10^5 microorganisms

e) Measurement

The measurement is made by placing a temperature sensing device probe into the product while undergoing pasteurization at a place where the heating is the slowest. Many such probes may have to be used in order to determine the slowest heating point in the product.

It is recommended to use special apparatus which not only measures and records the temperature at regular prescribed time intervals but can also directly calculate the pasteurization value.

Cooking Value

The cooking value concerns the effect of any thermal treatment on the product's organoleptic and nutritional characteristics, whether or not the treatment is applied to the final packaged product.

Definition

The cooking value is used to quantify, in terms of the criteria established by the manufacturer, the organoleptic and nutritional changes caused by cooking.

Measurement

As is the case for the pasteurizing value, the measurement of time/temperature sequence is done in several areas of the product, in particular the centre and the surface.

Scale

Whenever a new product is developed, a thermal process schedule must be defined in terms of temperature and time in order to obtain:

- The desired pasteurizing value as calculated from the slowest heating zone during the process which will ensure maintenance of the product's hygienic qualities under the conditions of use (expiry date, storage temperature, etc.).

- The desired cooking values (at the centre and on the surface) that take into account thermal treatments before or after packaging.

Thermal Treatment Procedure

Treatment should be conducted by specially trained personnel. The programming of the process or cooking can be assured by:

- measuring the time/temperature sequence of the product during the process.

- measuring the time/temperature sequence of the heating medium in which the food is placed, the hot water, sauce, oven air, etc.

Thermal Treatment Control

The thermal treatment of each batch is monitored to ensure that its application complies with the established schedule and produces at least the desired pasteurizing value.

Thermal treatment information is recorded and kept until at least one month after the expiry date of the product.

7.4.6 Cooling

Cooling should be completed quickly (in less than two hours) so that the product remains in the critical temperature range of 60°C to 10°C for the shortest possible time, since this temperature range is the most propitious for bacterial growth.

The choice of cooling facilities depends on the products being manufactured. Their features (capacity for refrigeration and so on) are adapted to the quantities involved in order to permit:

- Cooling without delay, with minimum holding time after cooking and before commencement of cooling.
- Uniform temperatures throughout the batch during cooling.

To accomplish this various techniques may be used:

- Rapid cooling facility at 0°C or less.
- Ice/water mixtures (< 1°C), with or without brine, in a bath, spray or flowing.

These facilities should be equipped with a system to monitor and record the temperature in the cooling facility or in the centre of the product.

The use of cook/chill equipment reduces the delay between the two operations, permits continuous recording of the product temperature and therefore results in better control of microbiological quality and manufacturing follow-up.

7.5 Packaging

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

The microbiological quality of container materials should be monitored. It may be necessary to provide a means of decontaminating containers before their use, especially if there is no thermal treatment following packaging.

7.5.2 Product containers, other than the single use type, 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 satisfactory condition and where necessary, cleaned and/or disinfected; after washing they should be well drained before filling. All packaging materials required for immediate use should be kept in the packing or filling area.

7.5.3 If the packaging operation is not carried out before cooking, it should, unless there are technical constraints, (slicing, assembling and so on), be done before cooling in order to minimize the risk of contamination and the growth of bacteria.

If packaging is done after cooling, it should be carried out in such a way as to limit the hazard of contamination. For this purpose, temperatures should be less than 12°C. Any rise in the product's temperature should be avoided during this operation and the hermetic seal of the wrapping should be monitored. It may be desirable to have a room with dust control and/or "laminar flow" cabinets.

7.5.4 Each container should, at the time of packaging, be permanently and clearly marked on one of its faces in plain language, to identify the producing establishment and lot or batch.

7.5.5 Processing and production records

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

7.6 Storage, Transportation and Use of the Finished Product

7.6.1 Storage and Transportation

To ensure that the safety and the quality of the product is maintained during the designated shelf-life, it is essential that it be kept refrigerated from the time it is packaged up to the time it is consumed or prepared for consumption.

The storage temperature requirements identified on the product's label must be observed in the successive stages of transportation, storage, distribution and sale. To attain this requirement the facilities and equipment (e.g., transportation vehicles, warehouses, distribution points, display cases etc.) should be well adapted to the task and properly maintained. There should also be rules governing the use of this equipment (limiting door opening and down time, etc.).

The temperatures of these facilities should be regularly and effectively monitored at the following two levels:

- Enclosures where the product is kept.
- The products themselves, which can be achieved by adapting the rapidly developing series of temperature indicating and recording devices designed to be attached to or enclosed in each product container.

Throughout the distribution chain, special attention should be given to:

- defrosting periods,
- the respective temperatures and volumes of the products during the transfer of merchandise, and
- anything that might damage the container and/or packaging.

The display of products for sale is a particularly sensitive point. When products are put on sale, they should be displayed in refrigerated counters that maintain the product's core temperature at the level specified on the container or package and which was previously established according to the product's shelf life.

The heat radiating properties of the lighting in retail outlets should be checked in order to avoid surface warming of products by radiation.

7.6.2 Use of the Product

Until the final stage of heating or use, prepared foods should remain as they are, in their containers, at their respective recommended temperatures.

When heating is required, it should be done in such a way that the product is brought to the desired temperature and kept there until serving time.

When these products are destined for the restaurant trade, they should be delivered to the customer within the two hours immediately following their withdrawal from cold storage. Any intermediate operation (decanting, portioning, slicing) must be done within these two hours unless otherwise specified by the official agency having jurisdiction.

7.7 Procedures for Supervision and Control of Hygiene Adapted to Each Plant

7.7.1 Principles

Each production unit must determine its own specific procedures for the assurance of optimal hygienic quality, in light of the characteristics of the specific unit operations, raw materials, environment, manufacturing techniques, work organization etc.

The recommended process for developing these procedures can be found in the "Health Analysis and Critical Control Point" system. (H.A.C.C.P).

The H.A.C.C.P. is a system which identifies specific hazard(s) (i.e., any biological, chemical or physical property that adversely affects the safety of the food) and preventative measures for their control. The system consists of the following seven principles:

Principle 1

Identify the potential hazard(s) associated with food production at all stages, from growth, processing, manufacture and distribution, until the point of consumption. Assess the likelihood of occurrence of the hazard(s) and identify the preventative measures for control.

Principle 2

Determine the points/procedures/operational steps that can be controlled to eliminate the hazard(s) or minimize its likelihood of occurrence - (Critical Control Point CCP).

Principle 3

Establish target level(s) and tolerances which must be met to ensure the CCP is under control.

Principle 4

Establish a monitoring system to ensure control of the CCP by scheduled testing or observations.

Principle 5

Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

Principle 6

Establish procedures for verification which include supplementary tests and procedures to confirm that HACCP is working effectively.

Principle 7

Establish documentation concerning all procedures and records appropriate to principles 1 to 6 and their application.

It is recommended that simple quick methods be used for monitoring operations and that they be carried out under one qualified person only.

7.7.2 Quality Coordinator

The control of all the measures developed in order to ensure optimal hygienic product quality should be the responsibility of one person, the quality coordinator. He or she should be a permanent employee of the establishment with duties independent of the production unit and well aware of the inherent dangers of contamination.

7.7.3 Initial Microbiological and Organoleptic Study

At the time products are designed, a microbiological and organoleptic study should be conducted by a competent person or agency with particular attention to:

- determination of the microbiological and organoleptic hazards related to the raw materials.
- identification of those related to all processing and distribution operations right up to consumption of the finished product.
- determination of the procedures required to control the hazard.
- validating the effectiveness of these control procedures by monitoring a limited number of samples with the understanding that it is essential to do these tests throughout the manufacturing process and not only at the end, when the product is finished.

This study is also used to determine the shelf life of a product, by taking into account:

- the thermal treatment applied to the product,
- the type of packaging (hermetic or not),
- the storage temperature, and
- an adequate margin of safety.

7.7.4 Monitoring of Critical Control Points

7.7.4.1 Temperature

The control of time/temperature sequences is essential for obtaining products of good hygienic quality.

These sequences should be monitored and recorded throughout the production cycle (for example, cooking and cooling graphs) and should be systematically preserved for at least one month beyond the expiry date of the product.

7.7.4.2 Hermetic Containers

Tests, for products in hermetically sealed containers should at least involve the following:

- the resistance of the film during the various treatments to which it will be exposed,
- the quality of the seal (appearance, vacuum leak testing, dye migration, water immersion, etc.),
- the absence of small perforations or tears (by the marking stamp, bones, etc.)

Visual checks at the time of packaging or packing are vital and should be followed up by regular tests.

All observations should be recorded.

7.8 Identification and Quality Control System

7.8.1 Each container containing a refrigerated prepared food should identify the following on the label; the date of production, type of food, establishment name, lot number, shelf life, storage temperature as well as the other information required by the official agency having jurisdiction, e.g., list of ingredients.

Note: Lot identification is essential in order to permit recall of the product, should it be required, and limit the recall to only those lots affected. This identification is also required for the application of the "first in, first out" principle.

7.8.2 A sample of at least 150 g from each lot or batch of refrigerated prepared food should be taken immediately after packaging and kept in its sealed container refrigerated for a period of at least one week past the expiration of the declared "use before" date. The sample should be taken from a lot immediately after completion of packaging. These samples then will be available for examination should product from the lot or batch be suspected of causing illness.

7.8.3 The regulatory agencies having jurisdiction should keep active and up to date files on the establishments manufacturing refrigerated prepared foods under their jurisdiction: a compulsory registration system seems to be the best solution for this purpose.

7.9 Laboratory Sampling and Test Methods

7.9.1 Finished products should be tested to verify their compliance with microbiological criteria set by regulations or specifications established by the customer.

7.9.2 Plans for control should be defined and kept at the plant in the form of written procedures.

7.9.3 It is essential to use laboratory procedures based on recognized or standard methods so that their results can be readily interpreted.

7.9.4 Laboratories checking for pathogenic microorganisms should be well separated from food processing areas.

- APPENDIX -

Values indicated in the table of the present appendix correspond to levels of bacterial contamination that can be expected in products manufactured, transported and distributed under conditions that conform to good hygienic practices.

Despite the various constraints imposed by the disparity of manufacturing procedures in various countries, prime consideration has been given to the work carried out by international authorities in the areas of sampling and interpretation of results, especially as regards interpretation of the results of microbiological analyses, with the goal of avoiding the drawing of unjustified conclusions from the results obtained.

1. Laboratory Smaples and Sampling Technique

1.1 Laboratory Samples:

The laboratory sample should be from the same product and should contain at least five sample units.

Note: 1. In order to conduct all analyses, the laboratory should have approximately 500 grams of the product, that is, five times 100 grams. Each of these 100 gram sample units should come from separate product units.

Note: 2. Special Cases

In the case of small scale production for which a collection of five samples taken at one time may prove to be excessive in relation to the quantity manufactured, samples may be taken over a longer period of time.

However, in cases where initial results are immediately judged to be unsatisfactory, five concurrent samples should be taken.

1.2 Sampling Technique

For refrigerated prepared foods, the sample unit used for preparing the initial suspension and subsequent decimal dilutions should be drawn from both the surface and internal areas of the product.

2. Interpretation of results

2.1 Acceptance by comparison of the results according to a 3 class sampling plan.

The plan's name indicates that the results of the analysis are interpreted on the basis of three classes or levels of contamination.

- acceptable levels which are equal to or less than the designated m level.
- marginally acceptable levels which are between those designated by m and M.
- unacceptable levels which are above M.

m: Values cited in this code. All results that are equal to or less than the m value are considered to be satisfactory; analytical tolerances, related to the methods employed, can be set for the m value.

M: Results greater than this value are not considered to be satisfactory; however, the product may not be considered toxic. Any sample unit having a value greater than M will result in the sample being judged as unsatisfactory.

n: Number of sample units composing the sample.

c: Number of sample units which may have values between m and M and the sample will still be judged to be satisfactory.

Practical Application

The quality of the lot is considered as satisfactory or acceptable on the basis of the criteria presented in this code when:

a) The observed values are all less than or equal to m (or m+ an analytical tolerance)

b) The result for any analytical unit in sample does not exceed the value for M; or the number of analytical units from the sample having values greater than m but less than M are equal to or less than the acceptance number c as defined in the sampling plan.

The quality of the lot is considered as unsatisfactory when:

a) The number of analytical units from the sample drawn from the lot have values greater than m and exceed the acceptance number c, or

b) In all cases in which values greater than M are observed.

2.2 Acceptance by comparison of the results according to a two class sampling plan

This type of plan is so designated because the results of the analysis are judged on the basis of two classes of contamination, no analytical tolerance is allowed since the results are expressed as:

- "absent in"; a satisfactory result
- "present in"; an unsatisfactory result and the product can be declared as unfit for human consumption.

This type of plan is particularly applicable to Salmonella contamination.

3. Microbiological Criteria

Note: It should be remembered that values obtained when measuring bacterial counts are not absolute and variations can be expected depending upon the nature of the media used. It is generally accepted that a 1/2 log variation can be expected with solid media and 1 log for liquid media.

Aerobic Colony count (30°C - 32°C 72 hours)
n = 5, c = 2, m = 3.1×10^5/g, M = 3.1×10^6/g

Sulpho-reducing Anaerobes
n = 5, c = 2, m = 30/g, M = 300/g

Coliforms
n = 5, c = 2, m = 10^3/g, M = 10^4/g

Faecal Coliforms
n = 5, c = 2, m = 10/g, M = 100/g

Staphylococcus aureus
n = 5, c = 2, m = 100/g, M = 1000/g

Salmonella

n = 5 x 25 g, c = 0, m = absent in 5 x 25 g

DRAFT PRINCIPLES AND APPLICATION OF THE HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) SYSTEM (At Step 3 of the Procedure)

PREAMBLE

The Hazard Analysis Critical Control Point (HACCP) system offers considerable benefits for food safety. Therefore, the Codex Committee on Food Hygiene recommended that its use should be encouraged. The purpose of this document is to state the principles to be used in applying HACCP to foods and outline its application, with special reference to Codex codes of practice and standards.

HACCP is primarily applied by the food industry, but is equally applicable throughout the food chain from the primary producer to final consumer. As well as enhanced food safety, benefits include better use of resources and more timely response to problems. In addition, the application of HACCP systems can aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety.

HACCP is a system which identifies specific hazards and preventative measures for their control to ensure the safety of food. HACCP is a tool to assess hazards and establish control systems that focus on preventative measures rather than relying mainly on end-product testing. Any HACCP system is capable of accommodating change, such as advances in equipment design, processing procedures or technological developments.

HACCP's successful application requires the full commitment and involvement of management and the workforce. It also requires a team approach; this team should include appropriate experts such as agronomists, veterinarians, production personnel, microbiologists, medical experts, public health specialists, chemists and engineers according to the particular study. The application of HACCP is compatible with the implementation of quality management systems, such as the ISO 9000 series, and is the system of choice in the management of food safety within such systems.

While the application of HACCP to food safety was considered here, the system can equally be applied to other aspects of food quality.

PRINCIPLES

HACCP is a system which identifies specific hazard(s) (i.e., any biological, chemical or physical property that adversely affects the safety of the food) and preventative measures for their control. The system consists of the following seven principles:

PRINCIPLE 1

Identify the potential hazard(s) associated with food production at all stages, from growth, processing, manufacture and distribution, until the point of consumption. Assess the likelihood of occurrence of the hazard(s) and identify the preventative measures for their control.

PRINCIPLE 2

Determine the points/procedures/operational steps that can be controlled to eliminate the hazard(s) or minimize its likelihood of occurrence - (Critical Control Point (CCP)). A "step" means any stage in food production and/or manufacture including raw materials, their receipt and/or production, harvesting, transport, formulation, processing, storage, etc.

PRINCIPLE 3

Establish target level(s) and tolerances which must be met to ensure the CCP is under control.

PRINCIPLE 4

Establish a monitoring system to ensure control of the CCP by scheduled testing or observations.

PRINCIPLE 5

Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

PRINCIPLE 6

Establish procedures for verification which includes supplementary tests and procedures to confirm that HACCP is working effectively.

PRINCIPLE 7

Establish documentation concerning all procedures and records appropriate to these principles and their application.

APPLICATION OF THE PRINCIPLES OF HACCP

During the hazard analysis and subsequent operations in designing and applying HACCP systems, consideration must be given to the impact of raw materials, ingredients, food manufacturing practices, role of manufacturing processes to control hazards, likely end-use of the product, consumer populations at risk and epidemiological evidence relative to food safety.

The intent of the HACCP system is to focus control at CCPs. Redesign of the operation should be considered if a hazard is identified but no CCPs are found. HACCP should be applied to each specific process separately. CCPs identified in an example of a process might not be the only ones identified for a specific application or might be of a different nature. HACCP systems should be developed for specific processes.

The HACCP application should be reviewed and necessary changes made when any modification is made in the product, process, or any step.

It is important when applying HACCP to be flexible given the context of the application.

Application

The application of HACCP principles requires the following tasks as identified in the Logic Sequence for Application of HACCP (Diagram 1).

1. Assemble HACCP team

Assemble a multidisciplinary team that has specific knowledge and expertise appropriate to the product. Where such expertise is not available on site, expert advice should be obtained from other sources.

2. Describe product

A full description of the product should be drawn up including information on composition and method of distribution.

3. Identify intended use

The intended use should be based on the expected uses of the product by the end user or consumer. In specific cases, vulnerable groups of the population, e.g., institutional feeding, may have to be considered.

4. Construct flow diagram

The flow diagram should be constructed by the HACCP team. Each step within the specified area of operation should be monitored and audited to produce the flow diagram. The flow diagram should be constructed for the particular part of the operation under consideration. When applying HACCP to a given operation, consideration should be given to steps preceding and following the specified operation.

5. On-site verification of flow diagram

The HACCP team should confirm the processing operation against the flow diagram during all stages and hours of operation and amend the flow diagram where appropriate.

6. List all hazards associated with each step and list any preventative measures to control hazards (Principle 1)

The HACCP team should list all the biological, chemical or physical hazards that may be reasonably expected to occur at each step and describe the preventative measures that can be used to control these hazards.

For inclusion in the list, hazards must be of a nature such that their elimination or reduction to acceptable levels is essential to the production of a safe food.

Preventative measures are those actions and activities that are required to eliminate hazards or reduce their impact or occurrence to acceptable levels. More than one preventative measure may be required to control a specific hazard(s) and more than one hazard may be controlled by a specified preventative measure.

7. Apply HACCP Decision Tree to Each Step (Principle 2)

The identification of a CCP in the HACCP system requires the application of a decision tree (Diagram 1). All hazards that may be reasonably expected to occur, or be introduced at each step, should be considered. Training in the application of decision trees may be required.

If an identified hazard has no preventative measure at the step then no CCP exists at the step.

Application of the decision tree determines whether the step is a CCP for the identified hazard. Application of the decision tree should be flexible, given whether the operation is for production, slaughter, processing, storage, distribution or other.

8. Establish target levels and tolerances for each CCP (Principle 3)

Target levels and tolerances must be specified for each preventative measure. In some cases more than one target level and tolerance will be elaborated at a particular step. Criteria often used include measurements of temperature, time, moisture level, pH, Aw, and available chlorine, and organoleptic parameters such as visual appearance and texture.

9. Establish a Monitoring System for Each CCP (Principle 4)

Monitoring is the scheduled measurement or observation of a CCP relative to its target levels and tolerances. The monitoring procedures must be able to detect loss of control at the CCP. Further, monitoring should ideally provide this information in time for corrective action to be taken to regain control of the process before there is a need to reject the product. Data derived from monitoring must be evaluated by a designated person with knowledge and authority to carry out corrective actions when indicated. If monitoring is not continuous, then the amount or frequency of monitoring must be sufficient to guarantee the CCP is in control. Most monitoring procedures for CCPs will need to be done rapidly because they relate to on-line processes and there will not be time for lengthy analytical testing. Physical and chemical measurements are often preferred to microbiological testing because they may be done rapidly and can often indicate the microbiological

control of the product. All records and documents associated with monitoring CCPs must be signed by the person(s) doing the monitoring and by a responsible reviewing official(s) of the company.

10. Establish Corrective Actions (Principle 5)

Specific corrective actions must be developed for each CCP in the HACCP system in order to deal with deviations when they occur.

The actions must ensure that the CCP has been brought under control. Actions taken must also include proper disposition of the affected product. Deviation and product disposition procedures must be documented in the HACCP record keeping.

Corrective action should also occur when monitoring results indicate a trend towards loss of control at a CCP. Action should be taken to bring the process back into control before the deviation leads to a safety hazard.

11. Verification (Principle 6)

Establish procedures for verification that the HACCP system is working correctly. Monitoring and auditing methods, procedures and tests, including random sampling and analysis, can be used to determine if the HACCP system is working correctly. Examples of verification activities include:

Review of the HACCP system and its records.

Review of deviations and product dispositions.

Operations to observe if CCPs are under control.

Validation of established target levels and tolerances.

The frequency of verification should be sufficient to validate the HACCP system.

12. Establish Record Keeping and Documentation (Principle 7)

Efficient and accurate record keeping is essential to the application of a HACCP system. Documentation of HACCP procedures at all steps should be included and assembled in a manual.

Examples of records are:

Ingredients
Records relating to product safety
Processing
Packaging
Storage and distribution
Deviation file
Modifications to the HAACP system

A convenient model checklist is attached as Figure 2.

TRAINING

Training of personnel in industry, government and academia in HACCP principles and applications, and increasing awareness of consumers are essential elements for the effective implementation of HACCP. The International Commission on Microbiological Specifications for Foods (ICMSF) Monograph, "HACCP in Microbiological Safety and Quality," which describes the type of training required for various target groups, is recommended as a general approach to training (Blackwell Scientific Publications, Oxford Mead, UK, 1988, reprinted 1989). The section on training (Chapter 8) in the above monograph is equally applicable as an approach to training in respect to hazards other than those of a microbiological nature.

Cooperation between industry, trade groups, consumer organizations and responsible authorities is of vital importance. Opportunities should be provided for the joint training of industry and control authorities to encourage and maintain a continuous dialogue and create a climate of understanding in the practical application of HACCP.

DIAGRAM 1

Logic Sequence for Application of HACCP

II. VERIFICATION

1. Assemble HACCP Team
2. Describe Product
3. Identify Intended Use
4. Construct Flow Diagram
5. On-Site Verification of Flow Diagram
6. List All Identified Hazards Associated With Each Step and List Any Preventative Measures to Control Hazards

Identifed Hazard	Step — Preventative Measures (PM)
Biological Chemical Physical	

7. Apply HACCP Decision Tree to Each Step (Answer Questions in Sequence)

Q1 — PM(s) Exist?

- PM(s) Exists → Q2 Is the Step Specifically Designed to Eliminate or Reduce the Likely Occurrence of a Hazard to an Acceptable Level?
  - No → Q3 Contamination With Identified Hazard(s) Occur in Excess of Acceptable Level(s) or Could These Increase to Unacceptable Level(s)?
    - Yes → Q4 Will a Subsequent Step Eliminate Identified Hazard(s) or Reduce Likely Occurrence to an Acceptable Level?
      - Yes → Not a CCP → STOP
      - No → **Critical Control Point**
    - No → Not a CCP → STOP
  - Yes → **Critical Control Point**
- No PM Exists → Not a CCP → Procede to next step in the described process

8. Establish Target levels and Tolerances for Each CCP
9. Establish a Monitoring System for Each CCP
10. Deviation → Corrective Action
11. Control
12. Establish Record Keeping and Documentation

Figure 2

HACCP CHECKLIST

1. Describe product

2. Diagram process flow

3. List:

Step	Hazards	Preventative Measures	CCP	Target Level and Tolerance	Monitoring Procedures	Corrective Actions