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JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX ALIMENTARIUS COMMISSION
Eighth Session, Geneva
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REPORT OF THE SEVENTH SESSION
OF THE
CODEX COMMITTEE ON FOOD HYGIENE

Washington D.C.
25-29 May, 1970

JOINT FAO/WHO FOOD STANDARDS PROGRAMME
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WASHINGTON, D.C., U.S.A.
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Introduction.

1. The Seventh Session of the Codex Committee on Food Hygiene was held at the Pan American Health Organization/WHO Building, in Washington, D.C., from 25 to 29 May 1970. The participants were welcomed on behalf of the Government of the U.S.A. by Mr. L. R. Shelton, Chairman of the Committee and Mr. G. Grange, Vice Chairman of the Codex Alimentarius Commission. The list of participants is contained in Appendix I to this report.

Adoption of Agenda.

2. The Committee, after some discussion, adopted the proposed agenda unanimously in the order of items to be discussed.

Matters arising from the Report of the Seventh Session of the Codex Alimentarius Commission relevant to the Work of the Committee.

3. The Committee took note of the contents of a Secretariat oral report covering matters dealt with by the Commission at its Seventh Session which were relevant to the work of the Committee. The report covered the following matters:

- (a) Code of Hygienic Practice for Meat - The Committee was informed that a Draft Code of Hygienic Practice for Meat had been prepared by an ad hoc group of experts convened by the Director-Generals of FAO/WHO. The draft Code is based on the General Principles of Food Hygiene with certain modifications and at an appropriate time, it may be referred to the Committee for comment.
- (b) Acceptance status of recommended codes of practice - The following recommended codes of practice were issued to governments:
 - (i) General Principles of Food Hygiene
 - (ii) Code of Hygienic Practice for Canned Fruit and Vegetable Products

(iii) Code of Hygienic Practice for Dried Fruits

- (c) XII.4 (Formerly XII.3) Rules of Procedure of the Commission - It was brought to the attention of the Committee that Spanish speaking delegations at the Commission meeting had requested the inclusion of the Spanish language in committee meetings. The Committee was informed that in general the Commission delegates of host countries had indicated that their governments were sympathetic to the wishes of the Spanish speaking delegations. By the same token, however, host country delegations also indicated they had no authority to commit their governments to any increased expenditure arising from the addition of Spanish as a further working language in the committees for which they were responsible. Some delegations from the host countries further indicated it would be extremely difficult for them, on practical grounds, to work in three languages.
- (d) Food Hygiene in Relation to Developing Countries - It was further brought to the attention of the Committee that the Ghanaian delegation expressed in the Commission meeting their concern and also the concern of other African countries on the applicability of the work of the Food Hygiene Committee with respect to Africa's special regional needs. The delegation from the U.S.A. at the Commission meeting opinioned the view that the Codex Committee on Food Hygiene might consider elaborating codes of hygienic practice specifically suited to the needs of the African countries and indicated that this matter would be brought to the attention of the Chairman of that Committee.

Discussion -

- (i) The Committee Chairman read excerpts from a letter from Dr. N. A. de Heer, Ministry of Health, Republic of Ghana, expressing regret for not being able to attend the meeting. Dr. de Heer requested, however, that cognizance be made by the Committee of the comments made by the Ghanaian delegation at the Commission meeting relating to its views on the applicability of the work of the Food Hygiene Committee to certain needs of some African countries. The Committee considered the point made in the letter and expressed concern for the African position. After a

general discussion, the Committee concluded that the recently issued Recommended International Code of Practice on General Principles of Food Hygiene could readily serve as a basic document for use by developing countries as expressed in the introductory section of that document. African countries should be encouraged to attend the Committee meetings to submit information on their special problems and needs to the Committee.

- (ii) The Committee noted that if a coordinating committee for Africa were established, it may be an appropriate body for continuing communications between the Committee on Food Hygiene and some countries of Africa with respect to their special needs.

The Committee further expressed its willingness to lend support on hygienic issues to a coordinating committee for Africa, should one be established, or to individual countries should they request such support on food hygiene issues.

- (iii) Subsequent to the above decision, the delegation of Nigeria expressed the view that the work of this Committee was mainly orientated to the conditions prevailing in developed countries. In the Nigerian delegation's opinion, developing countries would be able to comply with the provisions as laid down in the various Codes of Hygienic Practice as elaborated in the framework of the FAO/WHO Food Standards Programme, if only they received aid from developed countries and advice from this Committee with respect to improving present Hygienic Practices in Food Technology.

The Chairman replied that the Committee was in complete sympathy with the needs of the developing nations as stated by the Nigerian delegation. The Chairman emphasized that the Committee had, as stated previously, attempted to comply with such obligations when it drafted

the International Code of Practice on General Principles of Food Hygiene and that this document could very well be used by developing countries for guidance in prescribing adequate laws and regulations. It was further indicated that the document covers conditions in both developing and developed countries; as the same principles of food hygiene should be followed irrespective of the stage of development. He again referred to the discussions on the Seventh Session of the Codex Alimentarius Commission, at which the possibility of setting up the Coordinating Committee for Africa had been proposed; and indicated that this Committee would lend every support to the developing countries of Africa.

- (e) Terms of Reference of the Committee - The Committee noted that the Commission had discussed a proposal of an addition to the Terms of Reference of the Codex Committee on Food Hygiene regarding the relationship between the Committee and Expert Committees in the field of food hygiene as follows:

"The Committee may refer, where necessary, specific food hygiene problems, including, in particular, microbiological methodology and sampling, for consideration to the FAO and/or WHO, to bodies set up by them and to other organizations recognized by FAO and WHO, to be appropriate in respect to such reference."

The Committee further noted that the Commission had agreed not to change the existing Terms of Reference of the Committee as proposed. However, the Committee was instructed by the Commission to consult with the Executive Committee when the Committee had a need to refer specific problems for study to bodies operating outside the normal activities of the Commission. The Committee considered the response by the Commission would provide ample opportunity for it to seek advice from outside bodies on a case by case basis and thus allow it to function satisfactorily within its existing Terms of Reference.

- (f) Code of Hygienic Practice for Tree Nuts - The Commission directed the Committee to examine the scope of the proposed draft of Hygienic Practice for Tree Nuts to determine if the exclusion of coconuts is appropriate.

(1) Discussion. The Committee agreed that coconuts were excluded. The Committee also noted that the Code might not be suitable for other tropical tree nuts which had not been specifically considered when the Code was in the course of development. The Committee, therefore, recommended that the Secretariat ask governments to comment on this point and to include their reasons for suggesting exclusion of other tropical tree nuts.

Review of Comments from Other Groups that are of Concern to the Committee.

4. (a) Joint ECE/Codex Group of Experts on the Standardization of Fruit Juices - The Committee observed that paragraphs 7, 8, 26, and 40 in document ALINORM 70/14 were related to food hygiene matters. The Committee noted in paragraph 7, that the Group of Experts considered that the Draft Code of Hygienic Practice for Deep Frozen Fruit and Vegetable Products was suitable for frozen fruit juices. The Committee agreed that the contents of paragraphs 8 and 26 were not of immediate concern, and would be discussed at some future meeting.

The Committee noted the decision by the Group of Experts to delete from the hygiene section of all draft fruit juice standards, the reference to pathogenic organisms and the reasons supporting this decision. The Committee agreed that the phraseology used in the hygiene sections of the draft fruit juice standards is adequate since the idea of "free from pathogens" is embraced in the phraseology.

There was considerable discussion regarding the last 2 sentences in paragraph 40, concerning deletion of the mold count method. The Committee agreed to recommend to the Group of Experts that while their technological objections to the mold count method have merit, a statement should be made in the commodity standards for fruit juices that the product should be free from excessive mold. The Committee also considered that there might

well be a need for development of more suitable methodology in this field and the Committee thought it useful to bring this to the attention of the Group of Experts and other commodity committees.

- (b) Joint ECE/Codex Alimentarius Group of Experts on the Standardization of Quick Frozen Foods - It was observed that paragraphs 6, 15, 41, 42, and 43 of document ALINORM 70/25 were of interest to the Committee. The decision of the Joint ECE/Codex Group of Experts on Quick Frozen Foods not to give mandatory status to the end-product specifications contained in the Code of Hygienic Practice for Quick Frozen Fruits and Vegetables was noted.
- (c) Coordinating Committee for Europe - Paragraphs 10, 11, 13, 15, 44, and 45 of document ALINORM 70/19 were of interest to the Committee. The Committee expressed the view that the statement relative to the control of wild fungi was appropriately placed in the standard where indicated by the Coordinating Committee for Europe. The same rationale would also apply to the provisions relating to tolerances for mineral and organic impurities and for maggot damaged fungi.
- (d) Codex Committee on Cocoa Products and Chocolate - The Committee noted that its previous comments relating to end-product specifications on mold and yeast counts in cocoa and chocolate products would be considered at a later stage as detailed in paragraph 8 of document ALINORM 70/10.
- (e) Codex Committee on Methods of Analysis and Sampling - The Committee noted the views of the Committee on Methods of Analysis and Sampling related to the division of responsibility for sampling and assessment between the two committees as indicated in the document ALINORM 70/23. The Committee considered these views to be in accordance with the guidelines for Codex Committees.
- (f) Codex Committee on Processed Meat Products -
 - (i) The Committee observed that paragraphs 5, 6, 50, 51, 52, 53, 54, 71, 79, and 86 of document ALINORM 70/16 were of interest as they concern food hygiene matters. The Committee noted the points made in paragraphs 5, 6, 50, 51, 52, 53, and 54.

- (ii) With respect to paragraphs 71, 79, and 86, the Committee examined briefly the hygiene sections of the Draft Standards for Canned Luncheon Meat, Canned Chopped Meat, and Canned Corned Beef. The Committee noted that as many of these provisions were related to a Draft Code of Hygienic Practice for Processed Meat Products which had been circulated to governments at Step 3 of the procedure, it would be desirable to await receipt of government comments before examining the hygienic sections in question.

- (iii) The Chairman stated that he had received a letter from the Chairman of the Codex Committee on Processed Meat Products requesting the Committee to review the Draft Code of Hygienic Practice for Processed Meat Products at its Seventh Session. The Committee noted that the report of the Codex Committee on Processed Meat Products contained no recommendation that the Code should be referred to the Codex Committee on Food Hygiene for review and questioned whether it had authority to review the Code. Moreover, the Code appeared to be closely related to other codes in the course of development in the field of meat hygiene. The Committee expressed its willingness, however, to examine the Code for the various processed meat products should such a request be made.

- (iv) The Committee requested that its role be clarified by the Executive Committee relative to its role in the development of Codes of Hygienic Practice by commodity committees in the absence of direct referral to it by the subsidiary body of the Commission. In this connection, it was noted that Section 13(d) of the guidelines for Codex Committees appeared to refer to commodity standards only.

Referrals from Other Codex Committees

Codex Committee on Foods for Special Dietary Uses

- 5. The Committee considered the request of the Codex Committee on Foods for Special Dietary Uses as set out in paragraph 12 of

document ALINORM 70/26, that it should develop a Code of Hygienic Practice for Foods for Infants and Children.

The Committee noted that in the hygiene section of Appendix III, Proposed Draft Standard for Canned Baby Foods, of ALINORM 70/26 there is indicated that a Code of Practice for Foods for Dietary Uses also is to be prepared by the Committee.

6. The Committee agreed to ask for a clarification of the request for a code or codes of practice from the Codex Committee on Foods for Dietary Uses and suggested that a precise declaration of the scope of such a code or codes would be extremely helpful. Additionally, the Committee thought that the working paper on this subject being prepared by the Federal Republic of Germany also would be of value to the Committee.

Draft Code of Hygienic Practice for Desiccated Coconut

7. The Committee examined the above draft Code which was contained in document ALINORM 69/13, Appendix III to the Report of the Fifth Session of this Committee and agreed on minor changes. The draft Code as amended by the Committee is contained in Appendix II of this report. The Committee agreed to send the draft Code forward to the next session of the Codex Alimentarius Commission at Step 8 of the procedure.

Draft Code of Hygienic Practice for Dehydrated Fruits and Vegetables Including Edible Fungi

8. The Committee considered the above draft Code which is contained in document ALINORM 69/13, Appendix IV.

The discussion centered mainly around the possible necessity of extending the list of commodities to be covered by or to be excluded from the Code under consideration. A slight modification of the text of the Scope section was agreed upon.

The amended text of the Draft Code of Hygienic Practice for Dehydrated Fruits and Vegetables Including Edible Fungi is contained in Appendix III to this report.

The Committee agreed to send the draft Code forward to the next session of the Codex Alimentarius Commission at Step 8 of the procedure.

Draft Code of Hygienic Practice for Quick-Frozen Fruits, Vegetables and their Juices

9. The Committee had a full discussion on the Scope and Definition sections of the Code under consideration as contained in document ALINORM 69/13, Appendix V.

The Committee decided to modify the Scope as to cover quick-frozen fruit and vegetable juices as well. Consequently, the title of the Code was amended as given in the heading.

10. The Committee considered various definitions to cover quick-frozen fruits, vegetables and their juices, and finally decided to retain the definition as given in the draft under discussion. It was agreed to request the Joint ECE/Codex Alimentarius Group of Experts on the Standardization of Quick-Frozen Foods to elaborate a definition for the purpose of the Code. The following draft definition was proposed:

"Quick-frozen fruits, vegetables and their juices are those products which have been subjected to a freezing process carried out in such a manner that the range of temperatures of maximum crystallization is passed quickly and which thereafter have been reduced in temperature to -18°C . (0°F .) or lower at the thermal center after thermal stabilization."

The Committee agreed to advance the Draft Code of Hygienic Practices for Quick-Frozen Fruits, Vegetables, and their Juices to Step 8 of the procedure, subject to the Group of Experts on Quick Frozen Foods being in concurrence with the proposed definition. The revised Code appears as Appendix IV.

11. The Committee noted that reference was made to the General Standard for Quick-Frozen Foods in the Code. This had been amended to read Code of Practice for Quick-Frozen Foods. This Code is still in the process of elaboration.

Proposed Draft Code of Hygienic Practice for Egg Products

12. The Committee considered the above draft Code, and to avoid any misunderstanding about the scope of this Code agreed to delete the word egg from the proposed draft title Code of Hygienic Practice for Egg and Egg Products. Changes of substance were made in the document up to Section IV,C(6), and the revised part of the Code appears as Appendix V of this report. The Code was retained at Step 4 of the procedure.

13. Material redrafting of Section IV, D, on Operating Practices and Production Requirements had been presented by one of the participating countries, but due to circumstances beyond the control of the Committee, these drafting comments could not be forwarded to member governments prior to the meeting. The Committee recommended that the author country might redraft the Code in the light of the suggested new format and substantive comments as were agreed in the Committee discussions. The redrafted Code should reach the Chairman of the Committee by December 1, 1970, with a copy to the Chief, FAO/WHO Food Standards Programme, Rome. Comments would be sought from governments on the redrafted section of the Code.*/

14. The Code will be again placed before the Committee next year and the deliberations will begin with Section IV, D, Operating Practices and Production Requirements. The definitions (Section II) will be considered in the light of the redrafting.

Changes were made in several sections of the Code, including the following:

- (a) The enumeration of individual products in the Scope section was considered too limiting. The list of products was, therefore, deleted and replaced by provisions allowing for a broader generalization.
- (b) Dirty eggs should preferably not be washed on the farm--they should be dry cleaned. However, should washing be done, the water should have a temperature approved by the authority having jurisdiction and contain an approved detergent/sterilant.
- (c) The storage of eggs on the farm should be at such temperature and humidity as will minimize deterioration, based on local climatic conditions.
- (d) The ambiguity of Section IV, A(2)(e) dealing with drainage systems was clarified so that the manner of effective cleaning of in-plant sumps and solid matter traps could be left to the discretion of the plant manager.
- (e) The hygienic operating requirements were modified to provide for a more precise explanation of the cleaning procedure to be followed in the case of scheduled and unscheduled work stoppages.

*/ From Section IV.D. onwards the Code has been redrafted by the author country (United Kingdom). This redraft has been integrated into Appendix V.

- (f) Where pasteurizing equipment is cleaned by "cleaning in-place" (CIP) systems, the pasteurizing equipment should be dismantled and thoroughly cleaned at the end of each days' production.

Proposed Draft Code of Hygienic Practice for Poultry and Poultry Products.

15. The Committee examined in detail the above Draft Code of Hygienic Practice as contained in document ALINORM 70/13, Appendix II. The Committee agreed on several amendments to the draft. The text as amended by the Committee appears as Appendix VI to this report. The Committee agreed that the proposed draft Code should be submitted to the Commission at Step 5 of the procedure.

Changes made in the draft Code include the following:

- (a) The definition of the term "poultry" was expanded to include all domesticated birds.
- (b) The determination of "edible offal" may be defined by the consuming country.
- (c) When in-plant chlorination systems are used, the residual level of free chlorine should be maintained at an effective level.
- (d) An additional paragraph covering accommodation for clothing and footwear was included.
- (e) It was recognized that the use of scalding tanks may not be the most hygienic method for feather and hair removal. Therefore, special mention of this fact was set forth in the Code.
- (f) The heat treatment of reclaimed wax was thought to be of such significance as to warrant special recognition.
- (g) The hygienic status of a specific piece of equipment known in the trade as the "spin-chiller" was considered. It was agreed that the function of the "spin-chiller" was to reduce rapidly the temperature of carcasses. However, it was also recognized that the "spin-chiller" could permit cross-contamination of the carcasses with pathogenic microorganisms.

For this reason the Committee did not look upon the "spin-chiller" with favor. Nevertheless, the Committee readily recognized the extensive use of this equipment in poultry processing plants throughout the world. The Committee further noted there is a general lack of more hygienic alternative equipment which would be economically feasible. It was the consensus of the delegates that the reservations of the Committee should be expressed in the Code. The Committee further recommended that research was needed to make either the present equipment more hygienic or to develop new hygienic and economically feasible chilling techniques.

Proposed Draft Code of Hygienic Practice for Frozen Precooked Foods, including Semi-Cooked.

16. The necessity for the Code was originally proposed by this Committee at its First Session in 1964. The drafting of the Code has been exceedingly difficult over the years due to the excessively broad magnitude and diversity of products such a Code would entail. The present document was reworked by the author country, Canada, and again presented during this Committee meeting. The Committee concluded that the rationale for the purpose of this Code is as necessary now as was originally thought in 1964. However, since other Codes of Hygienic Practice are being developed which would include in their scope some quick frozen precooked foods, the question arose as to the scope of this document. It was, therefore, resolved that the Committee action on this document would be as follows:

- (a) The author country should be requested to revise the document in the light of developments over the past 6 years, and to determine the commodities in the Precooked Frozen Food area which might be covered by other hygiene codes.
- (b) The Executive Committee would be requested to offer advice and guidance to this Committee's future work on the Code in the light of other Codex work on frozen, precooked foods. The Committee would request guidance in the following areas:
 - (i) Whether it was appropriate for this Committee to continue to work on this Code with a generally defined scope.
 - (ii) Whether there was objection if the scope of the Code overlapped other codes.

- (iii) Whether the Committee should terminate work on this Code.

17. The Executive Committee should be informed of this Committee's view that a single code of practice is highly desirable in this type of product. The Committee agreed to retain the Code at Step 2 of the procedure.

Dates and Place of Next Session

18. To be fixed in consultation between the U.S.A. authorities and the Joint FAO/WHO Secretariat.

Summary of Status of Work (prepared by the Secretariat)

19. In accordance with the recommendations of the Sixth Session of the Codex Alimentarius Commission, the following is the status of work on Codes of Hygienic Practice:

(a) Codes considered at the Seventh Session of the Committee

- (i) Code of Hygienic Practice for Desiccated Coconut considered at Step 7 and recommended to go forward at Step 8.
- (ii) Code of Hygienic Practice for Dehydrated Fruits and Vegetables Including Edible Fungi considered at Step 7 and recommended to go forward at Step 8.
- (iii) Code of Hygienic Practice for Quick-Frozen Fruits, Vegetables and their Juices considered at Step 7 and recommended to go forward at Step 8 provided the proposed definition of Scope meets the approval of the Joint ECE/Codex Alimentarius Group of Experts on Standardization of Quick Frozen Foods.
- (iv) Proposed Draft Provisional Code of Hygienic Practice for Egg Products held at Step 4.
- (v) Code of Hygienic Practice for Poultry and Poultry Parts considered at Step 4 and advanced to Step 5.

(b) Codes held in abeyance

- (i)** Proposed Draft Code of Hygienic Practice for Frozen Precooked Foods, Including Semi-Cooked held at Step 2.
- (ii)** Information paper: Microbiological Examination of Low Acid, Heat Processed, Shelf Stable Foods in Cans, Glass and Retortable Pouches held for consideration at Eighth Session.

(c) New Codes to be considered at Eighth Session

- (i)** Code of Hygienic Practice for Handling Fresh and Frozen Fish at Sea and On Shore (United Kingdom in collaboration with Australia).
- (ii)** Code of Hygienic Practice for Fresh and Frozen Processed Fishery Products (United Kingdom in collaboration with Australia).
- (iii)** Code of Hygienic Practice for Canned Fish (United States).
- (iv)** Code of Hygienic Practice for Molluscan Shellfish (United States in collaboration with Italy).
- (v)** Code of Hygienic Practice for Smoked and Semi-preserved Fish Products (Netherlands in collaboration with the United States).

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DRAFT CODE OF HYGIENIC PRACTICE FOR DESICCATED COCONUT

(Advanced to Step 8 of the Procedure for Submission to the
8th Session of the Codex Alimentarius Commission)

To be read in conjunction with the Recommended General Principles of Food Hygiene. Side-lined portions indicate material which is particular to this Code of Hygienic Practice and therefore does not appear in the General Principles of Food Hygiene.

SECTION I - SCOPE

The following code of hygienic practice applies to desiccated coconut, the dried product prepared for human consumption without requiring further processing which is obtained by shredding or otherwise comminuting the pared kernel of coconuts, the fruit of the palm, Cocos nucifera.

SECTION II - DEFINITIONS

- A. Coconuts - coconuts consist of an outer skin (green or brown when harvested) enclosing a thick fibrous coating or husk; inside the husk is a woody shell which encloses the kernel and which is separated from it by a brown skin. The pared kernel consists of a solid white layer enclosing an aqueous liquid known as coconut milk.
- B. Coconut meat - white solid layer of the kernel.
- C. Dehusking - the removal of the husk, leaving the shell intact.
- D. Hatcheting - the removal of the shell.
- E. Paring - the removal of the brown skin around the kernel.

SECTION III - RAW MATERIAL REQUIREMENTS

- A. Environmental Sanitation in Growing and Food Production Areas

(1) Sanitary disposal of human and animal wastes

Adequate precautions should be taken to ensure that human and animal wastes are disposed of in such a manner as not to constitute a public health or hygienic hazard and extreme care should be taken to protect products from contamination with these wastes, particularly those products that may be consumed without heat treatment.

(2) Animal, plant pest and disease control

Where control measures are undertaken, treatment with chemical, biological or physical agents should be done only in accordance with the recommendations of the appropriate official agency, by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of toxic residues being retained by the crop.

B. Sanitary Harvesting and Food Production

(1) Sanitary techniques

Harvesting and production operations, methods and procedures should be clean and sanitary.

(2) Protection of product from contamination

After harvesting, clean and sanitary methods should be observed to protect against contamination of the nuts during the process of ripening and dehusking. Following dehusking, special precautions are necessary to ensure that contamination does not occur.

C. Transportation

(1) Facilities

Conveyances for transporting the harvested crop, which may have the husk removed on the plantation, should be adequate for the purpose and should be of such material and construction as will permit thorough cleaning, and should be so cleaned and maintained as not to constitute a source of contamination to the nuts.

(2) Handling procedures

All handling procedures should be such as will prevent the product from being contaminated. Extreme care should be taken in transporting dehusked coconuts to prevent spoilage or deterioration.

SECTION IV - PLANT FACILITIES AND OPERATING REQUIREMENTS

A. Plant Construction and Layout

(1) Location, size, and sanitary design

The buildings and surrounding area:

should be such as can be kept reasonably free of objectionable odours, smoke, dust, or other contamination;

should be of sufficient size for the purpose intended without crowding of equipment or personnel;

should be of sound construction and kept in good repair;

should be of such construction as to protect against the entrance and harbouring of insects, birds or vermin;

should be so designed as to permit easy and adequate cleaning.

Special precautions should be taken in the shredding, desiccating, and packing sections to protect against the entry of birds, insects and vermin and for this purpose all openings should be covered with perforated metal gauze or other suitable protective covering.

Separate and adequate space should be provided for the storage of nuts awaiting manufacture, shell awaiting disposal, rejected nuts, firewood, etc.

Floors should be constructed of material which is not capable of supporting microbial growth, and should be hard surfaced. They should be designed and so drained as to facilitate effective cleaning.

(2) Sanitary facilities and controls

(a) Separation of processes

The husk, if it is not removed in the growing area, should be removed in a place separate from the factory. Dehusked nuts should be received into the factory buildings, and the processes of hatcheting, paring, and washing of the coconut meat should be carried out in a separate section from the subsequent processes. There should be no direct access from the hatcheting, paring, and washing sections to the other sections.

The sections should be so arranged that the coconut passes from the hatcheting, paring, and washing sections through to the packing room without retracing its path or passing through an area used for ancillary activities. Precautions should be taken to prevent contamination of shredding, desiccating, and packing sections of the factory with dust.

Separate rooms or compartments should be provided for the storage of inedible materials, such as fuel and lubricants. The food handling area should be completely separated from any part of the premises used as living quarters.

(b) Water supply

An ample supply of cold water should be available and an adequate supply of hot water where necessary. The water supply should be of potable quality. Standards of potability shall be not less than those contained in the "International Standards for Drinking Water," World Health Organization, 1963. No husk pit for the retting of husks should be located within 100 metres (300 feet) of any well from which water is drawn for use in the factory.

(c) Auxiliary water supply

Where non-potable water is used - for such purposes as fire control - it must be carried in completely separate lines, identified preferably by colour and with no cross-connection or back-siphonage with the lines carrying potable water.

(d) Plumbing and waste disposal

All plumbing and waste disposal lines (including sewer systems) must be large enough to carry peak loads. All lines must be watertight and have adequate traps and vents. Disposal of waste should be effected in such a manner as not to permit contamination of potable water supplies. The plumbing and the manner of waste disposal should be approved by the official agency having jurisdiction.

(e) Lighting and ventilation

Premises should be well lit and ventilated. Special attention should be given to the venting of areas and equipment producing excessive heat, steam, obnoxious fumes or vapours, or contaminating aerosols. Good ventilation is important to prevent both condensation (which may drip into the product) and mold growth in overhead structures - which growth may fall into the food. Light bulbs and fixtures suspended over food in any step of preparation should be of the safety type or otherwise protected to prevent food contamination in the case of breakage.

(f) Toilet-rooms and facilities

Adequate and convenient toilets should be provided and toilet areas should be equipped with self-closing doors. Toilet rooms should be well lit and ventilated and should not open directly into a food handling area. They should be kept in a sanitary condition at all times. There should be associated hand-washing facilities within the toilet area and notices should be posted requiring personnel to wash their hands after using the toilet.

(g) Washing facilities

Adequate and convenient facilities for employees to wash and dry their hands should be provided wherever the process demands. They should be in full view of the processing floor. Single-use towels are recommended, but otherwise the method of drying should be approved by the official agency having jurisdiction.

In addition, where applicable, foot baths containing a suitable bactericidal solution should be provided at all appropriate entrances to the factory.

The facilities should be kept in a sanitary condition at all times.

B. Equipment and Utensils

(1) Materials

All food contact surfaces should be smooth; free from pits, crevices, and loose scale; non-toxic; unaffected by the coconut meat and milk; and capable of withstanding repeated exposure to normal cleaning, and non-absorbent unless the nature of a particular and otherwise acceptable process renders the use of a surface such as wood necessary.

(2) Sanitary design, construction and installation

Equipment and utensils should be so designed and constructed as will prevent hygienic hazards and permit easy and thorough cleaning. Stationary equipment should be installed in such a manner as will permit easy and thorough cleaning.

(3) Equipment and utensils

Equipment and utensils used for inedible or contaminating materials should be so identified and should be used only for handling such products. Suitable containers should be provided for the collection of coconut shell and parings, and for rejected kernels.

Desiccators used for the coconut meat must not under any circumstances be used for the drying of coconut parings.

C. Hygienic Operating Requirements

(1) Sanitary maintenance of plant, facilities, and premises

The building, equipment, utensils, and all other physical facilities of the plant should be kept in good repair and should be kept clean and maintained in an orderly sanitary condition. Waste materials should be frequently removed from the working area during plant operation and adequate waste receptacles should be provided. All equipment in the shredding, desiccating, and packing sections coming into direct contact with the coconut should be cleaned, washed, and disinfected after each period of work and at least twice daily by means approved by the official agency. Detergents and disinfectants employed should be appropriate to the purpose and should be so used as to present no hazard to public health.

(2) Vermin control

Effective measures should be taken to protect against the entrance of insects, rodents, birds, or other vermin into the plant, and especially into the shredding, desiccating, packing and storage sections, and against the harbourage of these pests on the premises.

(3) Exclusion of domestic animals

Dogs, cats, and other domesticated animals should be excluded from areas where coconut or coconut products are processed or stored.

(4) Personnel health

Plant management should advise personnel that any person afflicted with infected wounds, sores, or any illness, notably diarrhoea, should immediately report to management. Management should take care to ensure that no person, while known to be affected with a disease capable of being transmitted through food, or known to be a carrier of such disease microorganisms, or while afflicted with infected wounds, sores, or any illness, is permitted to work in any area of a food plant in a capacity in which there is a likelihood of such person contaminating food or food-contact surfaces with pathogenic organisms.

(5) Toxic substances

All rodenticides, fumigants, insecticides or other toxic substances should be stored in separate locked rooms or cabinets and handled only by properly trained personnel. They should be used only by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of contamination of the product.

(6) Personnel hygiene and food handling practices

- (a) All persons working in a food plant should maintain a high degree of personal cleanliness while on duty. Clothing including suitable headdress should be appropriate to the duties being performed and should be kept clean.
- (b) Hands should be washed as often as necessary to conform to hygienic operating practices.
- (c) Spitting, eating, and the use of tobacco, betel nut, or chewing gum should be prohibited in food handling areas.
- (d) All necessary precautions should be taken to prevent the contamination of the food product or ingredients with any foreign substance.
- (e) Minor cuts and abrasions on the hands should be appropriately treated and covered with a suitable waterproof dressing. Adequate first-aid facilities should be provided to meet these contingencies so that there is no contamination of the food.
- (f) Gloves used in food handling should be maintained in a sound, clean and sanitary condition; gloves should be made of an impermeable material except where their usage would be inappropriate or incompatible with the work involved.

D. Operating Practices and Production Requirements

(1) Raw material handling

(a) Acceptance criteria

The raw material should not be accepted by the plant if known to contain decomposed toxic or extraneous substances which will not be removed to acceptable levels by normal plant procedures of sorting or preparation.

(b) Storage

Coconuts stored on the plant premises should be maintained under conditions that will protect against contamination and infestation, and minimize deterioration.

(2) Inspection and sorting

At the paring and washing stage, all kernels should be inspected and any unfit, including germinated kernels, rejected. Such operations should be carried out in a clean and sanitary manner. Only clean, sound coconut meat should be permitted for further processing.

(3) Washing

Water used for washing the kernels should be clean and of potable quality. It should be so frequently changed that the possibility of contamination is kept to a minimum and the water should not be recirculated unless suitably treated, for example by filtration and chlorination, to maintain it in a condition such as will not constitute a public health hazard.

(4) Preparation and processing.

(a) Preparatory operations

Preparatory operations leading to the finished product and the packaging operations should be so timed as to permit expeditious handling of consecutive units in production under conditions which would prevent contamination, deterioration, spoilage, or the development of infectious or toxigenic microorganisms.

(b) Processing

After washing and before shredding, the coconut meat should be subjected to an effective process to eliminate pathogenic organisms from the surface of the meat, such as immersion in an adequate quantity of boiling water for a period of not less than one and a half minutes.

(c) Handling

After this process, the coconut meat should not be manually handled in any way, but mechanical devices, or containers and scoops or rakes or other implements constructed of impervious materials, should be used to prevent contamination. Such implements should be cleaned, washed, and disinfected after each period of work and at least twice daily, by means approved by the official agency, and suitable racks or other places provided for their placing when not in use, such that they do not become contaminated.

(d) Desiccating

Shredded coconut should be dried in a current of clean hot air free from chemical contamination until the moisture content reaches a safe level

for storage. There should be thin layering of the shredded coconut on the desiccator trays, and effective methods for the breaking up of the mat should be used. After drying, the desiccated coconut should be cooled before packaging.

(e) Bulk storage

If desiccated coconut is not packed at the factory into the containers in which it will be shipped, it should be transported to the packing plant in nonabsorbent containers capable of being cleaned and which are disinfected before filling at the factory. The same hygienic precautions should be taken in the packing plant as are appropriate to the packing section at the factory.

(5) Packaging of finished product

(a) Materials

Packaging materials should be stored in a clean and sanitary manner, should not transmit to the product objectionable substances beyond limits acceptable to the official agency having jurisdiction, and should provide appropriate protection from contamination. The packaging material should be approved by the official agency and, for example, may comprise multiwall paper sacks with appropriate fat- and moisture-resistant layers or aluminium lined cases.

(b) Techniques

Packaging should be done in a separate clean room. Precautions such as the use of magnets or metal detectors should be taken to eliminate any metallic contamination. Packaging should be done under conditions that preclude the introduction of contamination into the product, and mechanical rams or vibrators should be used so as to eliminate manual handling of the desiccated coconut.

(c) Information on label

All containers should be so marked as to identify the factory at which the desiccated coconut has been manufactured or packed.

(6) Storage and transport of finished product

The finished product should be stored and transported under such conditions as will preclude the contamination with, or development of pathogenic or toxigenic microorganisms or infestation and protect against deterioration of the product or of the container.

E. Sanitation Control Programme

It is desirable that each plant in its own interest designate a single individual, whose duties are preferably divorced from production, to be held responsible for the cleanliness of the plant. His staff should be a permanent part of the organization and should be well trained in the use of special cleaning tools, methods of disassembling equipment for cleaning, and in the significance of contamination and the hazards involved. Critical areas, equipment and materials should be designated for specific attention as part of a permanent sanitation schedule.

F. Laboratory Control Procedures

Regular and frequent samples of desiccated coconut should be taken from the packing section and examined for:

- (1) contamination with any objectionable matter
- (2) microorganisms
- (3) fat content and free fatty acids
- (4) moisture content

SECTION V - END-PRODUCT SPECIFICATIONS

Desiccated coconut should be the clean, sound, wholesome product of the pared kernel of sound mature coconuts.

Appropriate methods should be used for sampling, analysis, and determination to meet the following specifications:

- A. To the extent possible in good manufacturing practice the product should be free from objectionable matter.
- B. The product should not contain pathogenic microorganisms such as salmonellae or any toxic substance originating from microorganisms.
- C. The product should be such that the acidity of the oil extracted by the solvent process should not exceed 0.3% m/m of free fatty acids calculated as lauric acid.
- D. The moisture content of the product should not exceed 3% m/m.

DRAFT CODE OF HYGIENIC PRACTICE FOR DEHYDRATED FRUITS AND VEGETABLES
INCLUDING EDIBLE FUNGI

(Advanced to Step 8 of the Procedure for Submission to the
8th Session of the Codex Alimentarius Commission)

To be read in conjunction with the Recommended General Principles of Food Hygiene. Side-lined portions indicate material which is particular to this Code of Hygienic Practice and therefore does not appear in the General Principles of Food Hygiene.

SECTION I - SCOPE

This code of practice applies to fruits and vegetables which are artificially dehydrated (including freeze-dried), either from the succulent stage or in combination with sun-drying, and covers the products commonly associated with the phrase "dehydrated food."

Such fruits and vegetables are relatively low in moisture and generally unpalatable in dehydrated form and can be held under normal conditions without significant decay due to mold, enzymatic, or bacterial action.

The fruit or vegetable may be sliced, cubed, diced, granulated, or in other subdivided form, or left whole prior to dehydration.

Fruits (dried to a maximum moisture content of 5% m/m) covered by this code include, but are not limited to: apples, bananas, cranberries, cherries, bilberries.

Vegetables covered by this code include, but are not limited to: artichokes, asparagus, green beans, cabbage, cauliflower, celery, sweet corn, eggplant, onions, green peas, potatoes, squash, sweet potatoes, tomatoes, edible cultivated mushrooms, and whole and sliced dried wild fungi according to the list of acceptable varieties established by the competent authority of the consuming country.

Exclusion: Tree nuts and the relatively high moisture content "dried fruits" of commerce, which are edible in the dry state; other dried products such as, cereal grains, pulses and legumes including dried ripened beans, dried peas other than green peas, dried spices, and other dry food products which only on occasion require an artificial drying or conditioning treatment prior to storage.

SECTION II - DEFINITIONS

Dehydration is the removal of moisture by artificial means and in some cases in combination with sun-drying.

SECTION III - RAW MATERIAL REQUIREMENTS

A. Environmental Sanitation in Growing and Food Production Areas

(1) Sanitary disposal of human and animal wastes

Adequate precautions should be taken to ensure that human and animal wastes are disposed of in such a manner as not to constitute a public health or hygienic

hazard, and extreme care should be taken to protect the product from contamination with these wastes.

(2) Sanitary quality of irrigation water

Water used for irrigation should not constitute a public health hazard to the consumer through the product.

(3) Animal, plant pest and disease control

Where control measures are undertaken, treatment with chemical, biological or physical agents should be done only in accordance with the recommendations of the appropriate official agency, by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of toxic residues being retained by the crop.

B. Sanitary Harvesting and Food Production

(1) Equipment and product containers

Equipment and product containers should not constitute a hazard to health. Containers which are re-used should be of such material and construction as will facilitate thorough cleaning, and should be so cleaned and maintained as not to constitute a source of contamination to the product.

(2) Sanitary techniques

Harvesting and production operations, methods and procedures should be clean and sanitary.

(3) Removal of obviously unfit materials

Unfit products should be segregated during harvesting and production to the fullest extent practicable and should be disposed of in such a place and in such a manner that they cannot result in contamination of the food and water supplies or other crops.

(4) Protection of product from contamination

Suitable precautions should be taken to protect the raw product from being contaminated by animals, insects, vermin, birds, chemical or microbiological contaminants or other objectionable substances during handling and storage. The nature of the product and the methods of harvesting will indicate the type and degree of protection required.

C. Transportation

(1) Facilities

Conveyances for transporting the harvested crop or raw product from the production area, place of harvest or storage should be adequate for the purpose intended and should be of such material and construction as will permit thorough cleaning and should be so cleaned and maintained as not to constitute a source of contamination to the product.

(2) Handling procedures

All handling procedures should be such as will prevent the product from being contaminated. Extreme care should be taken in transporting perishable products to prevent spoilage or deterioration. Special equipment - such as refrigeration equipment - should be used if the nature of the product or distances involved so indicate. If ice is used in contact with the product, it should be of sanitary quality as required in Section IV - A.(2c).

SECTION IV - PLANT FACILITIES AND OPERATING REQUIREMENTS

A. Plant Construction and Layout

(1) Location, size, and sanitary design

The building and surrounding area should be such as can be kept reasonably free of objectionable odours, smoke, dust, or other contaminants; should be of sufficient size for the purpose intended without crowding of equipment or personnel; should be of sound construction and kept in good repair; should be of such construction as to protect against the entrance or harbouring of insects or birds or vermin; and should be so designed as to permit easy and adequate cleaning. In areas experiencing high concentrations of air-borne pollutants, equipment should be used to remove pollutants from the air blown across or through the product.

(2) Sanitary facilities and controls

(a) Separation of processes

Areas where raw materials are received or stored should be so separated from areas in which final product preparation or packaging is conducted as to preclude contamination of the finished product. Areas and compartments used for storage, manufacture or handling of edible products should be separate and distinct from those used for inedible materials. The food handling area should be completely separated from any part of the premises used as living quarters.

(b) Water supply

An ample supply of hot and cold water should be available. The water supply should be of potable quality. Standards of potability shall not be less than those contained in the "International Standards for Drinking Water," World Health Organization, 1963.

(c) Ice

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

(d) Auxiliary water supply

Where non-potable water is used - for such purposes as fire control - it must be carried in completely separate lines, identified preferably by colour and with no cross-connection or back-siphonage with the lines carrying potable water.

(e) Plumbing and waste disposal

All plumbing and waste disposal lines (including sewer systems) must be large enough to carry peak loads. All lines must be water-tight and have adequate traps and vents. The plumbing and the manner of waste disposal should be approved by the official agency having jurisdiction.

Removal of solid or semi-solid wastes from the product preparation, processing, canning and packing areas should be on a continuous or near continuous basis, using water and/or appropriate equipment so that these areas are kept clean and there is no danger of contaminating the product.

Waste material should be disposed of in a place and in such a manner that it cannot be used for human food and cannot contaminate food and water supplies and cannot offer harbourage or be a breeding place for rodents, insects, or other vermin.

(f) Lighting and ventilation

Premises should be well lit and ventilated. Special attention should be given to the venting of areas and equipment producing excessive heat, steam, obnoxious fumes or vapours, or contaminating aerosols. Good ventilation is important to prevent both condensation (which may drip into the product) and mold growth in overhead structures - which growth may fall into the food. Light bulbs and fixtures suspended over food in any step of preparation should be of the safety type or otherwise protected to prevent food contamination in the case of breakage.

(g) Toilet-rooms and facilities

Adequate and convenient toilets should be provided and toilet areas should be equipped with self-closing doors. Toilet rooms should be well lit and ventilated and should not open directly into a food handling area. They should be kept in a sanitary condition at all times. There should be associated hand-washing facilities within the toilet area and notices should be posted requiring personnel to wash their hands after using the toilet.

(h) Hand-washing facilities

Adequate and convenient facilities for employees to wash and dry their hands should be provided wherever the process demands. They should be in full view of the processing floor. Single-use towels are recommended, where practicable, but otherwise the method of drying should be approved by the official agency having jurisdiction. The facilities should be kept in a sanitary condition at all times.

B. Equipment and Utensils

(1) Materials

All food contact surfaces should be smooth; free from pits, crevices and loose scale; non-toxic; unaffected by food products; and capable of withstanding repeated exposure to normal cleaning; and non-absorbent unless the nature of a particular and otherwise acceptable process renders the use of a surface, such as wood necessary.

(2) Sanitary design, construction and installation

Equipment and utensils should be so designed and constructed as will prevent hygienic hazards and permit easy and thorough cleaning. Stationary equipment should be installed in such a manner as will permit easy and thorough cleaning.

(3) Equipment and utensils

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

(4) Construction of drying equipment

Equipment used for drying should be so constructed and operated that the product cannot be adversely affected by the drying medium.

C. Hygienic Operating Requirements

(1) Sanitary maintenance of plant, facilities and premises

The building, equipment, utensils and all other physical facilities of the plant should be kept in good repair and should be kept clean and maintained in an orderly, sanitary condition. Waste materials should be frequently removed from the working area during plant operation and adequate waste receptacles should be provided. Detergents and disinfectants employed should be appropriate to the purpose and should be so used as to present no hazard to public health.

(2) Vermin control

Effective measures should be taken to protect against the entrance into the premises and the harbourage on the premises of insects, rodents, birds or other vermin.

(3) Exclusion of domestic animals

Dogs, cats and other domestic animals, should be excluded from areas where food is processed or stored.

(4) Personnel health

Plant management should advise personnel that any person afflicted with infected wounds, sores, or any illness, notably diarrhoea, should immediately report to management. Management should take care to ensure that no person, while known to be affected with a disease capable of being transmitted through food, or known to be a carrier of such disease microorganisms, or while afflicted with infected wounds, sores, or any illness, is permitted to work in any area of a food plant in a capacity in which there is a likelihood of such person contaminating food or food-contact surfaces with pathogenic organisms.

(5) Toxic substances

All rodenticides, fumigants, insecticides or other toxic substances should be stored in separate locked rooms or cabinets and handled only by properly trained personnel. They should be used only by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of contamination of the product.

(6) Personnel hygiene and food handling practices

- (a) All persons working in a food plant should maintain a high degree of personal cleanliness while on duty. Clothing including suitable headdress should be appropriate to the duties being performed and should be kept clean.
- (b) Hands should be washed as often as necessary to conform to hygienic operating practices.
- (c) Spitting, eating and the use of tobacco or chewing gum should be prohibited in food handling areas.
- (d) All necessary precautions should be taken to prevent the contamination of the food product or ingredients with any foreign substance.
- (e) Minor cuts and abrasions on the hands should be appropriately treated and covered with a suitable waterproof dressing. Adequate first-aid facilities should be provided to meet these contingencies so that there is no contamination of the food.

- (f) Gloves used in food handling should be maintained in a sound, clean and sanitary condition; gloves should be made of an impermeable material except where their usage would be inappropriate or incompatible with the work involved.

D. Operating Practices and Production Requirements

(1) Raw material handling

(a) Acceptance criteria

The raw material should not be accepted by the plant if known to contain decomposed toxic or extraneous substances which will not be removed to acceptable levels by normal plant procedures of sorting or preparation.

(b) Storage

Raw materials stored on the plant premises should be maintained under conditions that will protect against contamination and infestation and minimize deterioration.

(c) Water

Water used for conveying raw materials into the plant should be from such a source or suitably treated as not to constitute a public health hazard and should be used only by permission of the official agency having jurisdiction.

(2) Inspection and sorting

Prior to introduction into the processing line, or at a convenient point within it, raw materials should be inspected, sorted or culled as required to remove unfit materials. Such operations should be carried out in a clean and sanitary manner. Only clean, sound materials should be used in further processing.

(3) Washing or other preparation

Raw materials should be washed as needed to remove soil or other contamination. Water used for such purposes should not be recirculated unless suitably treated to maintain it in a condition as will not constitute a public health hazard. Water used for washing, rinsing or conveying final food products should be of potable quality.

(4) Preparation and processing

Preparatory operations leading to the finished product and the packaging operations should be so timed as to permit expeditious handling of consecutive units in production under conditions which would prevent contamination, deterioration, spoilage, or the development of infectious or toxigenic microorganisms.

(5) Packaging of finished product

(a) Materials

Packaging materials should be stored in a clean and sanitary manner and should not transmit to the product objectionable substances beyond limits acceptable to the official agency having jurisdiction and should provide appropriate protection from contamination.

(b) Techniques

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

(6) Preservation of finished product

Methods of preservation or treatment of the finished product should be such as to kill any insects or mites remaining after processing and to result in protection against contamination, deterioration, or development of a public health hazard. The finished product should be of such moisture content that it can be held in the localities of origin and distribution under any normally foreseeable conditions for those localities without significant deterioration by decay, mold, enzymatic changes, or other causes.

In addition to appropriate drying, the finished product may be

- (a) treated with chemical preservatives (including fumigants) approved by the Codex Commission, provided the residue levels resulting from such treatment do not exceed the tolerances, as referenced in the Commodity Standards; and/or
- (b) heat processed; and/or
- (c) packed in hermetically sealed containers so that the product will remain safe and will not spoil under normal non-refrigerated storage conditions.

(7) Storage and transport of finished products

The finished products should be stored and transported under such conditions as will preclude the contamination with or development of pathogenic or toxigenic microorganisms and protect against rodent and insect infestation and deterioration of the product or of the container.

- (a) The product should be stored under suitable conditions of time, temperature, humidity, and atmosphere, to prevent significant deterioration. Humidity control is of primary importance for this product.
- (b) Where dehydrated products are stored under conditions in which they may become infested by insects and mites, appropriate methods of protection should be used regularly.

The dehydrated products should be stored in such a manner that they can be fumigated in situ or so stored that they can be removed elsewhere for fumigation in special facilities (e.g. fumigation chambers, steel barges, etc.).

Cold storage can be used, either to prevent infestation in localities where insects are likely to be present in ordinary storage or to prevent insects damaging the product.

E. Sanitation Control Programme

It is desirable that each plant in its own interest designate a single individual, whose duties are preferably divorced from production, to be held responsible for the cleanliness of the plant. His staff should be a permanent part of the organization and should be well trained in the use of special cleaning tools, methods of disassembling equipment for cleaning, and in the significance of contamination and the hazards involved. Critical areas, equipment and materials should be designated for specific attention as part of a permanent sanitation schedule.

F. Laboratory Control Procedures

In addition to any control by the official agency having jurisdiction, it is desirable that each plant in its own interest should have access to laboratory control of the sanitary quality of the products processed. The amount and type of such control will vary with the food product as well as the needs of management. Such control should reject all foods that are unfit for human consumption. Analytical procedures used should follow recognized or standard methods in order that the results may be readily interpreted.

SECTION V - END-PRODUCT SPECIFICATIONS

Appropriate methods should be used for sampling, analysis, and determination to meet the following specifications:

- A. To the extent possible in good manufacturing practice, the products should be free from objectionable matter.
- B. The products should not contain any pathogenic microorganisms or any toxic substances originating from microorganisms.
- C. The products should comply with the requirements set forth by the Codex Committees on Pesticide Residues and Food Additives as referenced in the Commodity Standards.

DRAFT CODE OF HYGIENIC PRACTICE FOR
QUICK FROZEN FRUITS, VEGETABLES AND THEIR JUICES

(Advanced to Step 8 of the Procedure for Submission to the
8th Session of the Codex Alimentarius Commission)

To be read in conjunction with the Recommended General Principles of Food Hygiene. Side-lined portions indicate material which is particular to this Code of Hygienic Practice and therefore does not appear in the General Principles of Food Hygiene.

SECTION I - SCOPE

This code of practice applies to blanched or unblanched fruits, vegetables and their juices packed in suitable containers and which have been quick frozen either before or after packing.

SECTION II - DEFINITIONS

- A. Quick frozen fruits, vegetables and their juices are those which are frozen according to the process defined by the Joint ECE/Codex Alimentarius Group of Experts on Standardization of Quick Frozen Foods.
- B. Containers for quick frozen fruits, vegetables and their juices should be so constructed as to protect the product from contamination; be suitable for the type of product and may be of cardboard, plastic, metal, or other appropriate material, lined or coated as need be.

SECTION III - RAW MATERIAL REQUIREMENTS

A. Environmental Sanitation in Growing and Raw Food Production Areas

(1) Sanitary disposal of human and animal wastes

Adequate precautions should be taken to ensure that human and animal wastes are disposed of in such a manner as not to constitute a public health or hygienic hazard and extreme care should be taken to protect products from contamination with these wastes, particularly those products that may be consumed without heat treatment.

(2) Sanitary quality of irrigation water

Water used for irrigation should not constitute a public health hazard to the consumer through the product.

(3) Animal, plant pest and disease control

Where control measures are undertaken, treatment with chemical, biological or physical agents should be done only in accordance with the recommendations of the appropriate official agency, by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of toxic residues being retained by the crop.

B. Sanitary Harvesting and Food Production

(1) Equipment and product containers

Equipment and product containers should not constitute a hazard to health. Containers which are re-used should be of such material and construction as will facilitate thorough cleaning, and should be so cleaned and maintained as not to constitute a source of contamination to the product.

(2) Sanitary techniques

Harvesting and production operations, methods and procedures should be clean and sanitary.

(3) Removal of obviously unfit materials

Unfit products should be segregated during harvesting and production to the fullest extent practicable and should be disposed of in such a place and in such a manner that they cannot result in contamination of the food and water supplies or other crops.

(4) Protection of product from contamination

Suitable precautions should be taken to protect the raw product from being contaminated by animals, insects, vermin, birds, chemical or microbiological contaminants or other objectionable substances during handling and storage. The nature of the product and the methods of harvesting will indicate the type and degree of protection required.

C. Transportation

(1) Facilities

Conveyances for transporting the harvested crop or raw product from the production area, place of harvest or storage should be adequate for the purpose intended and should be of such material and construction as will permit thorough cleaning and should be so cleaned and maintained as not to constitute a source of contamination to the product.

(2) Handling procedures

All handling procedures should be such as will prevent the product from being contaminated. Extreme care should be taken in transporting perishable products to prevent spoilage or deterioration. Special equipment - such as refrigeration equipment - should be used if the nature of the product or distances involved so indicate. If ice is used in contact with the product, it should be of sanitary quality as required in Section IV - A.(2c).

SECTION IV - PLANT FACILITIES AND OPERATING REQUIREMENTS

A. Plant Construction and Layout

(1) Location, size and sanitary design

The building and surrounding area should be such as can be kept reasonably free of objectionable odours, smoke, dust, or other contamination; should be of sufficient size for the purpose intended without crowding of equipment or personnel; should be of sound construction and kept in good repair; should be of such construction as to protect against the entrance and harbouring of insects or birds or vermin; and should be so designed as to permit easy and adequate cleaning.

(2) Sanitary facilities and controls

(a) Separation of processes

Areas where raw materials are received or stored should be so separated from areas in which final product preparation or packaging is conducted as to preclude contamination of the finished product. Areas and compartments used for storage, manufacture or handling of edible products should be separate and distinct from those used for inedible materials. The food handling area should be completely separated from any part of the premises used as living quarters.

(b) Water supply

An ample supply of hot and cold water should be available. The water supply should be of potable quality. Standards of potability shall not be less than those contained in the "International Standards for Drinking Water," World Health Organization, 1963.

(c) Ice

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

(d) Auxiliary water supply

Where non-potable water is used - for such purposes as fire control - it must be carried in completely separate lines, identified preferably by colour and with no cross-connection or back-siphonage with the lines carrying potable water.

(e) Plumbing and waste disposal

All plumbing and waste disposal lines (including sewer systems) must be large enough to carry peak loads. All lines must be water-tight and have adequate traps and vents. The plumbing and the manner of waste disposal should be approved by the official agency having jurisdiction.

Removal of solid or semi-solid wastes from the product preparation, processing and packaging areas should be on a continuous or near continuous basis, using water and/or appropriate equipment so that these areas are kept clean and there is no danger of contaminating the product.

Waste material should be disposed of in such a place and in such a manner that it cannot be used for human food, cannot contaminate food and water supplies, and cannot offer harbourage or be a breeding place for rodents, insects, or other vermin.

(f) Lighting and ventilation

Premises should be well lit and ventilated. Special attention should be given to the venting of areas and equipment producing excessive heat, steam, obnoxious fumes or vapours, or contaminating aerosols. Good ventilation is important to prevent both condensation (which may drip into the product) and mold growth in overhead structures - which growth may fall into the food. Light bulbs and fixtures suspended over food in any step of preparation should be of the safety type or otherwise protected to prevent food contamination in the case of breakage.

(g) Toilet-rooms and facilities

Adequate and convenient toilets should be provided and toilet areas should be equipped with self-closing doors. Toilet rooms should be well lit and ventilated and should not open directly into a food handling area. They should be kept in a sanitary condition at all times. There should be associated hand-washing facilities within the toilet area and notices should be posted requiring personnel to wash their hands after using the toilet.

(h) Hand-washing facilities

Adequate and convenient facilities for employees to wash and dry their hands should be provided wherever the process demands. They should be in full view of the processing floor. Single-use towels are recommended, where practicable, but otherwise the method of drying should be approved by the official agency having jurisdiction. The facilities should be kept in a sanitary condition at all times.

B. Equipment and Utensils

(1) Materials

All food contact surfaces should be smooth; free from pits, crevices and loose scale; non-toxic; unaffected by food products; and capable of withstanding repeated exposure to normal cleaning; and non-absorbent unless the nature of a particular and otherwise acceptable process renders the use of a surface, such as wood necessary.

(2) Sanitary design, construction and installation

Equipment and utensils should be so designed and constructed as will prevent hygienic hazards and permit easy and thorough cleaning. Stationary equipment should be installed in such a manner as will permit easy and thorough cleaning.

(3) Equipment and utensils

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

C. Hygienic Operating Requirements

(1) Sanitary maintenance of plant, facilities and premises

The building, equipment, utensils and all other physical facilities of the plant should be kept in good repair and should be kept clean and maintained in an orderly, sanitary condition. Waste materials should be frequently removed from the working area during plant operation and adequate waste receptacles should be provided. Detergents and disinfectants employed should be appropriate to the purpose and should be so used as to present no hazard to public health.

(2) Vermin control

Effective measures should be taken to protect against the entrance into the premises and the harbourage on the premises of insects, rodents, birds or other vermin.

(3) Exclusion of domestic animals

Dogs, cats and other domestic animals, should be excluded from areas where food is processed or stored.

(4) Personnel health

Plant management should advise personnel that any person afflicted with infected wounds, sores, or any illness, notably diarrhoea, should immediately report to management. Management should take care to ensure that no person, while known to be affected with a disease capable of being transmitted through food, or known to be a carrier of such disease microorganisms, or while afflicted with infected wounds, sores, or any illness, is permitted to work in any area of a food plant in a capacity in which there is a likelihood of such person contaminating food or food-contact surfaces with pathogenic organisms.

(5) Toxic substances

All rodenticides, fumigants, insecticides, or other toxic substances should be stored in separate locked rooms or cabinets and handled only by properly trained personnel. They should be used only by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of contamination of the product.

(6) Personnel hygiene and food handling practices

(a) All persons working in a food plant should maintain a high degree of personal cleanliness while on duty. Clothing including suitable headdress should be appropriate to the duties being performed and should be kept clean.

(b) Hands should be washed as often as necessary to conform to hygienic operating practices.

(c) Spitting, eating and the use of tobacco or chewing gum should be prohibited in food handling areas.

(d) All necessary precautions should be taken to prevent the contamination of the food product or ingredients with any foreign substance.

(e) Minor cuts and abrasions on the hands should be appropriately treated and covered with a suitable waterproof dressing. Adequate first-aid facilities should be provided to meet these contingencies so that there is no contamination of the food.

(f) Gloves used in food handling should be maintained in a sound, clean and sanitary condition; gloves should be made of an impermeable material except where their usage would be inappropriate or incompatible with the work involved.

D. Operating Practices and Production Requirements

(1) Raw material handling

(a) Acceptance criteria

The raw material should not be accepted by the plant if known to contain decomposed toxic or extraneous substances which will not be removed to acceptable levels by normal plant procedures of sorting or preparation.

(b) Storage

Raw materials stored on the plant premises should be maintained under conditions that will protect against contamination and infestation and minimize deterioration.

(c) Water

Water used for conveying raw material into the plant should be from a source or suitably treated as not to constitute a public health hazard and should be used only by permission of the official agency having jurisdiction.

(2) Inspection and sorting

Prior to introduction into the processing line, or at a convenient point within it, raw materials should be inspected, sorted or culled as required to remove unfit materials. Such operations should be carried out in a clean and sanitary manner. Only clean, sound materials should be used in further processing.

(3) Washing or other preparation

Raw materials should be washed as needed to remove soil or other contamination. Water used for such purposes should not be recirculated unless suitably treated to maintain it in a condition as will not constitute a public health hazard. Water used for washing, rinsing or conveying final food products should be of potable quality.

(4) Preparation and processing

(a) Preparatory operations leading to the finished product and the packaging operations should be so timed as to permit expeditious handling of consecutive units in production under conditions which would prevent contamination, deterioration, spoilage, or the development of infectious or toxigenic microorganisms.

(b) In order to avoid microbial proliferation, fruits, vegetables and their juices intended for quick freezing should be cooled as quickly as possible, and kept at as low temperature as possible related to the holding time before quick freezing. The product should be frozen as soon as possible thereafter to prevent deterioration. The initial drop in temperature in the freezing process must take place as quickly as possible in accordance with good manufacturing practice.

(5) Packaging of finished product

(a) Materials

Packaging materials should be stored in a clean and sanitary manner and should not transmit to the product objectionable substances beyond limits acceptable to the official agency having jurisdiction and should provide appropriate protection from contamination.

(b) Techniques

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

(6) Preservation of finished product

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

(7) Storage, transportation and distribution

The provisions relating to storage, transportation, distribution and re-freezing should be those being elaborated by the Joint ECE/Codex Group of Experts on Quick Frozen Foods in their General Code of Practice for Quick Frozen Foods.

(8) Information on label

The packages of quick frozen foods should bear clear indications as to the way to keep them from the time they are bought at the retailer to that of their use.

E. Sanitation Control Programme

It is desirable that each plant in its own interest designate a single individual, whose duties are preferably divorced from production, to be held responsible for the cleanliness of the plant. His staff should be a permanent part of the organization and should be well trained in the use of special cleaning tools, methods of disassembling equipment for cleaning, and in the significance of contamination and the hazards involved. Critical areas, equipment and materials should be designated for specific attention as part of a permanent sanitation schedule.

F. Laboratory Control Procedures

In addition to any control by the official agency having jurisdiction, it is desirable that each plant in its own interest should have access to laboratory control of the sanitary quality of the products processed. The amount and type of such control will vary with the food product as well as the needs of management. Such control should reject all foods that are unfit for human consumption. Analytical procedures used should follow recognized or standard methods in order that the results may be readily interpreted.

SECTION V - END-PRODUCT SPECIFICATIONS

Appropriate methods should be used for sampling, analysis and determination to meet the following specifications:

- A. To the extent possible in good manufacturing practice, the products should be free from objectionable matter.
- B. The products should not contain any pathogenic microorganisms or any toxic substances originating from microorganisms.
- C. The products should comply with the requirements set forth by the Codex Committees on Pesticide Residues and Food Additives, as referenced in the Commodity Standards.

PROPOSED DRAFT PROVISIONAL CODE OF HYGIENIC PRACTICE FOR
EGG PRODUCTS

(Retained at Step 4 of the Procedure.

- Sections I to IV.D. have been discussed at the 7th Session of the Committee.
- Section IV.D. and onwards have been redrafted by the author country (UK) and are open for Government Comments (see paras 12-14 of the Report))

To be read in conjunction with the Recommended General Principles of Food Hygiene. Side-lined portions indicate material which is particular to this Code of Hygienic Practice and therefore does not appear in the General Principles of Food Hygiene.

SECTION I - SCOPE

This Code of Practice is designed to:

- A. Prevent deterioration in the quality of eggs in shell intended for processing into egg products.
- B. Prescribe a code of hygienic practice for the production for human consumption of whole egg, egg albumen, egg yolk, and other products consisting wholly or mainly of one or more of the constituents of egg.
- C. Prescribe a code of hygienic practice relating to premises, plant, equipment, and personnel used or engaged in the production of these products.

Unless specifically stated otherwise, the word "egg" in this code relates to domesticated chickens' eggs intended for processing as above.

SECTION II - DEFINITIONS

(To be developed if necessary)

SECTION III - RAW MATERIAL REQUIREMENTS

A. Environmental Sanitation in Production Areas

- (1) As in the General Principles of Food Hygiene.
- (2) Animal, plant pest and disease control. Where control measures are undertaken, treatment with chemical, biological or physical agents should be done only in accordance with the recommendations of the appropriate

official agency, by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibilities of toxic residues being retained by the product.

B. Sanitary Harvesting and Production of Raw Materials

- (1) As in the General Principles of Food Hygiene.
- (2) Sanitary techniques. To prevent deterioration in the quality of eggs intended for processing in accordance with this Code of Practice, it is essential that steps be taken to prevent:

- (a) Contamination of the shell with dirt, bedding materials or any other extraneous matter.
- (b) Exposures to unfavorable temperatures.
- (c) Rough handling.

Eggs should be collected at least twice a day or more frequently if necessitated by the climatic conditions and should be handled as little as possible.

Dirty eggs should preferably be dry cleaned either with simple hand equipment or with a dry cleaning machine. Where this is not practicable, dirty eggs should preferably not be washed on the farm. If however they are washed on the farm the eggs should be washed in water containing a detergent/sterilant approved by the official agency having jurisdiction and at an approved temperature.

- (3) Removal of obviously unfit materials. Unfit eggs should be segregated during collection to the fullest extent practicable, and should be disposed of in a manner such as will prevent contamination of other eggs or water supplies.
- (4) Protection of product from contamination. As in the General Principles of Food Hygiene but omitting last sentence and with the addition of the following:

Eggs should be stored in a cool room to which they should be taken immediately after collection. They should not be stacked or packed into boxes until they are cool, and the room should be kept free from strong smelling substances and odors. Eggs should be stored at such a temperature and relative humidity as will minimize deterioration having regard to local climatic conditions.

Thin-shelled or hair-cracked eggs should be carefully handled and packed in a separate container to prevent breakage before delivery to the breaking plant.

C. Transportation

- (1) Facilities. As in the General Principles of Food Hygiene with the addition of the following:

Eggs should be collected from the producers' premises and delivered to the processing plant as soon as possible, and be maintained at such a temperature as will minimize deterioration having regard to local climatic conditions.

- (2) As in the General Principles of Food Hygiene but omitting last sentence.

SECTION IV - PLANT, FACILITIES, AND OPERATING REQUIREMENTS

A. Plant Construction and Layout

- (1) Location, size, and sanitary design. As in the General Principles of Food Hygiene with the addition of the following:

The construction and layout of the processing premises should be such as to secure a regulated flow in the process from the arrival of the eggs at the premises to the finished product, and should provide for correct temperature storage at all stages of the process.

- (2) Sanitary facilities and controls.

- (a) Separation of processes. As in the General Principles of Food Hygiene with the addition of the following: Separate rooms should be provided for unpacking the eggs and storing the finished product. Breaking, pasteurizing, and filling should be so separated as to protect against cross contamination but where appropriate may be carried out in recognized areas of the same rooms.

- (b), (c), and (d) As in the General Principles of Food Hygiene.

- (e) Plumbing and waste disposal. As in the General Principles of Food Hygiene with the addition of the following:

Drainage systems which include sumps or solid matter traps should be designed so as to allow them to be emptied. When located within the plant, sumps and solid matter traps should be emptied and thoroughly cleaned and disinfected at the close of every working day.

- (f) Lighting and ventilation. As in the General Principles of Food Hygiene with the addition of the following:

The illumination in any part of a workroom should be not less than 325 lux units (30 foot candles), and at points requiring close examination of the product they should be illuminated at an intensity of not less than 540 lux units (50 foot candles). Reflector filaments should be designed to allow easy dismantling, cleaning, and reassembling.

Ventilation should be planned to allow for adequate circulation or changes of air and to ensure that the direction of air flow is never from a dirty area to a clean one.

(g) and (h) As in the General Principles of Food Hygiene.

B. Equipment and Utensils

- (1) As in the General Principles of Food Hygiene.
- (2) Sanitary design, construction, and installation. As in the General Principles of Food Hygiene with the addition of the following:

Wooden equipment should not be used in the breaking, pasteurizing, or filling rooms.

All pumps, pipes, vessels, and contact surfaces should be of stainless steel or other approved material.

Containers for shell eggs moving into the breaking room and breaking tables should be of stainless steel, aluminum, or of plastic materials. Plastic materials used for this purpose should be free from cracks and scratches and should be capable of withstanding the regular cleaning and disinfection process.

- (3) As in the General Principles of Food Hygiene.

C. Hygienic Operating Requirements

- (1) Sanitary maintenance of plant, facilities, and premises. As in the General Principles of Food Hygiene with the addition of the following:

Whenever the process is stopped for approximately 30 minutes or more all hand breaking equipment and easily removable parts of breaking machines should be cleaned and disinfected. At the same time the surfaces of breaking tables should be cleaned, liberally hosed with clean water, and wiped dry with clean single use disposable cloth or tissues.

All equipment should be thoroughly cleaned and disinfected at all major breaks in work periods. Disinfection should always be carried out before commencement of the day's work. Steam condensate should not be allowed to remain in any equipment. Where "in-place" cleaning is carried out, pasteurizing equipment should be dismantled and cleaned at the end of each day's production and other equipment should be dismantled and cleaned when manual inspection indicates defective "in-place" cleaning.

The final stage of cleaning should be a thorough rinse with clean, hot water.

After disinfection plant and equipment should be handled as little as possible. Waste materials (including empty shells and reject eggs) should be stored in such a manner as not to cause a nuisance from offensive odors, flies, or other vermin. They should be removed from the premises at least once daily. Immediately after emptying, the receptacles should be thoroughly washed out with hot water and detergent, and the paved area used for storage of waste receptacles should be thoroughly cleaned and disinfected.

(2), (3), (4), (5), and (6) As in the General Principles of Food Hygiene.

(7) Disposal of waste materials. Waste materials, including empty shells and reject eggs, should be removed regularly and frequently from processing rooms either in suitable containers or by means of conveyer belts or water troughs. Containers and any equipment used for such purposes as consolidating shells should be thoroughly cleaned and disinfected before return to the processing rooms, and the paved area used for the storage of waste receptacles should be cleaned and disinfected. Waste materials should be stored in such a manner as not to cause a nuisance from offensive odors, flies, or other vermin. They should be removed from the premises daily.

[NOTE. The following part of this code of hygienic practice has been redrafted by the author country (United Kingdom) for discussion at Step 4:]

D. Operating Practices and Production Requirements

(1) Raw material handling. On receipt at the plant, shell eggs should be stored in their cases in a cool clean room and processed as soon as possible. Cases should be stored in such a way as to permit cleaning underneath.

Eggs should be unpacked in a room completely separated from the processing rooms.

Egg cases and fittings should not be taken into the breaking room.

- (2) Inspection and sorting. Dirty eggs should be cleaned before breaking out.

Cracked eggs with shell membranes intact should be segregated in shallow containers constructed of suitable materials and should be carefully examined by experienced breakers before processing.

Cracked eggs with shell membranes broken should be dealt with as waste material, but if the breakage has occurred within the plant during candling or handling they should be segregated in a suitable receptacle used for this purpose only. Such eggs should be processed without delay.

Eggs should be candled before being passed into the breaking room. Where collective breaking by machine is used special care is necessary during candling to eliminate defective eggs.

To avoid cross contamination, eggs other than chicken eggs should be segregated and handled and processed separately at the end of the day's processing of chicken eggs. All equipment should be thoroughly cleaned and sterilised before the processing of chicken eggs is resumed.

- (3) Preparation and processing.

- (a) Breaking - individually. Eggs should be broken either by hand or machine into cups or trays and each egg should be inspected for odour and appearance.

Machines and containers should be of stainless steel or other suitable material and should be so constructed as to permit the ready elimination from the liquid egg supply of all egg contents that are unfit for further processing.

Egg substance having an abnormal odour or appearance should be rejected and removed, together with any contaminated breaking equipment. Such equipment should be thoroughly cleaned and sterilised before being used again. After handling rejected egg, the breaker should immediately wash his hands with odourless soap/detergent in hot water.

The separation of egg yolk from egg white should, where appropriate, be carried out by an approved separating device of sanitary design and construction.

Blood spots, meat spots and shell fragments should, if the eggs are otherwise of a satisfactory internal quality, be removed from the egg in a hygienic manner.

- (b) **Breaking - collectively.** Machines used for breaking out eggs collectively for the preparation of whole egg product should be of a suitable type and be so constructed and operated as to permit the ready elimination from the liquid egg supply of egg contents that are unfit for further processing.

Eggs which are to be broken out in bulk crushing machines should be candled within 24 hours of processing, provided that where the eggs are held under controlled temperature conditions so as to retard spoilage and the growth of micro-organisms, they may be held for a period not exceeding 72 hours without recandling.

The eggs should be conveyed on rollers of stainless steel or other suitable material through a hot water bath at an approved and controlled temperature, rinsed under hot water sprays and afterwards air dried before being ejected on to a conveyor belt, constructed of suitable material, in the crushing section.

The eggs should be crushed to remove their contents, after which all shell fragments should be removed on the conveyor belt. At the end of each day's work the machines should be cleaned, scrubbed with a suitable sterilant, rinsed and wiped dry with a single-service cloth or tissue.

- (c) **Straining and collection.** The liquid egg should be strained either by suitable strainers, centrifuges or other suitable equipment. If strainers are used a supply of clean sterilised stainless steel, monel, or other suitable strainers should be available to enable frequent changes to be made. A clean, sterilised stainless steel or other suitable container should be used to collect liquid egg when strainers are being changed. This liquid egg should be added immediately to the receiving tank.
- (d) **Chilling.** After straining, liquid products which are to be held for more than 8 hours before further processing should be chilled rapidly to a temperature not exceeding 3.3°C (38°F). Liquid products which are to be held for less than 8 hours before further processing should be chilled to a temperature not exceeding 7°C (45°F) or in the case of liquid egg yolk and albumen 10°C (50°F). The liquid product should preferably be pasteurised as part of a continuing process, but where this is not practicable, it may be held in suitably insulated storage tanks at a temperature not exceeding 3.3°C (38°F) for a period not exceeding 24 hours.
- (e) **Pasteurisation.** All egg products, except liquid albumen that is to be pan dried, should be pasteurised by an approved method acceptable to the official agency having jurisdiction.

The chilled raw liquid egg should be pasteurised by being retained at a temperature not lower than 64.4°C (148°F) for at least $2\frac{1}{2}$ minutes. Other approved processes of heating to a temperature sufficiently high and for a time sufficiently long to ensure the destruction of Salmonella organisms, or other treatment which will give the same results, may be employed.

The pasteurisation of liquid albumen and liquid egg yolk may require different time/temperature combinations. On completion of pasteurisation, liquid products, other than egg yolk, should be immediately cooled to a temperature not exceeding 3.3°C (38°F).

Liquid egg yolk should be cooled immediately after pasteurisation to a temperature not exceeding 10°C (50°F) and progressively reduced to a temperature not exceeding 3.3°C (38°F).

The pasteurising apparatus should include such devices as may be necessary to ensure a constant rate of flow of liquid egg, thermostatic control of the heating of the liquid egg, and the automatic diversion of flow of any liquid egg not sufficiently heated.

A continuous recording should be made of each pasteurisation run, and charts showing pasteurisation temperatures should be dated and kept available for inspection.

(f) Storage. Pasteurised liquid egg may be held in sterilised, insulated, chilled and covered tanks fitted with a low speed agitation and a thermometer, or in sterilised churns, provided that the temperature of the egg does not exceed 3.3°C (38°F) during the holding period.

(g) Packing and freezing.

(1) Empty containers should be stored in a clean dry place and kept free from dust, vermin, insects and any foreign matter. They should be inspected immediately before use to ensure they are in a clean and satisfactory condition. Prior to filling containers should, where applicable, be sterilised by steam or hot air, but if steam is used, they should be well drained before filling.

Open top cans with polythene liners, and corrugated or fibreboard containers using polythene and heat sealing mediums may also be used.

Only containers ready for immediate use should be kept in the filling room.

(11) The filling of containers should be a continuous process. The filled containers should be immediately sealed and taken to the freezing chambers without undue delay. Care should be taken during filling to avoid spillage and any excess egg should be removed with a single service cloth or tissue.

(iii) Containers should be stacked in the freezing chambers so as to permit free circulation of air around the containers.

(iv) The rate of freezing should be sufficient to prevent deterioration of the product and be completed within 24 hours of filling. After freezing, the product should be stored at a temperature not exceeding -10°C (14°F).

(h) Drying.

(i) The de-sugaring process should, where applicable, be carried out prior to pasteurisation.

(ii) Except in the case of liquid albumen that is to be pan dried, liquid products intended for drying should have been pasteurised prior to drying.

(iii) Drying should be carried out by an approved process. The drying plant used for the product should, where applicable, include a cyclone separation system in preference to the bag type separation.

(iv) The product should be continuously removed from the drying chamber, cooled, and packed as soon as possible into suitable containers. If the product was not desugared, it should be stored at a temperature not exceeding 10°C (50°F).

(j) Transportation of liquid egg products in bulk.

(i) Tanks or containers used for transporting liquid egg products should be constructed of stainless steel or other suitable material, be designed to facilitate cleaning, and should be adequately drained. They should be refrigerated or sufficiently insulated to maintain the egg product at a temperature of not more than 4.4°C (40°F), and should not be used for any other purpose.

(ii) Pipes and connections used for the filling and discharge of the liquid egg products should be of suitable design and materials and should be sterilised before use.

(iii) The temperature of the liquid egg product at the time of filling should not exceed 3.3°C (38°F) and should not rise to more than 4.4°C (40°F) during transit.

(iv) Liquid egg products should not be discharged from a road tanker or mobile container into a vessel containing liquid egg product from a previous delivery.

(v) Tankers, mobile containers and bulk storage tanks should be sterilised before being filled, and after emptying should be cleaned as soon as practicable. Delivery of liquid egg products from the compartment of a tanker should be to one point only. Pipes and connections should be sterilised before use and cleaned as soon as practicable after use.

- (vi) Bulk storage tanks should be refrigerated or suitably insulated to maintain the egg product at a temperature not exceeding 4.4°C (40°F), and, for long term storage, should be fitted with a slow speed agitator.
- (k) Defrosting of frozen egg products.
 - (i) When frozen egg products are being defrosted, they should be brought to their liquid state as quickly as possible, but with as little increase of the temperature of the product above 0°C (32°F) as possible.
 - (ii) Defrosted egg products should be used immediately.

E. Sanitation Control Programme

As in the General Principles of Food Hygiene.

F. Laboratory Control Procedures

As in the General Principles of Food Hygiene.

SECTION V - END PRODUCT SPECIFICATIONS

As in the General Principles of Food Hygiene with the addition of the following:

Where pasteurisation of raw liquid egg products is carried out at a temperature of 64.4°C (148°F) for at least $2\frac{1}{2}$ minutes the alpha amylase test should be used as a test of efficacy. Samples of pasteurised egg product shall be deemed to have passed the alpha amylase test if the filtrate or liquor in the solution of iodine immediately turns a blue-violet colour. For this purpose, colours more blue-violet than 3 of a standard Lovibond Comparator Disc 4/26 or of a comparable spectrophotometric standard shall be taken as satisfactory. Bacteriological tests should also be applied, including tests for freedom from salmonellae. */

*/ This method is to be discussed in the light of the Netherlands' paper on microbiological tests in relation to the presence of salmonellae in egg products. The paper on salmonellae methodology is reproduced in Annex I to this Code.

COMMENTS OF THE NETHERLANDS ON
MICROBIOLOGICAL TESTS IN RELATION TO THE PRESENCE
OF SALMONELLAE IN EGG PRODUCTS

Salmonellae in egg products are usually present in small numbers only. This means that pasteurization which gives a 6 - 7 decimal reduction will make a sufficient large sample free from salmonellae. An indicator test for a time-temperature combination which will give such a reduction was developed in the United Kingdom by means of an investigation of the inactivation of alpha-amylase. This test will give a check on the proper heat-treatment of the product. However, if the initial count of salmonellae has been extremely high, there may be salmonellae present even when the alpha-amylase is inactivated. Moreover, a recontamination of the product after heating which may occur in egg processing plants will not readily be detected by means of this test.

These objections do not apply for a bacteriological test using a suitable indicator group of organisms. The Enterobacteriaceae test can be used very well for this purpose. The Netherlands' proposal is to examine samples of pasteurized egg products for the presence of Enterobacteriaceae in two subsamples of 0.1 g. During the year 1968, 188 samples of pasteurized and unpasteurized egg products taken at random were examined for the presence of Enterobacteriaceae and alpha-amylase. Of these samples 52 (27.6%) were positive for both tests, 95 (50.6%) were negative for both tests. In 21 samples (11.2%) Enterobacteriaceae were absent in 0.1 g but alpha-amylase was not sufficiently inactivated. In 22 samples (10.6%) Enterobacteriaceae were present while alpha-amylase was sufficiently inactivated. From these 188 samples salmonellae could be isolated 16 times (8.5% of the samples). All these 16 samples were positive for both tests. These numbers indicate that in 73.2% of the samples examined there was a complete correlation between the two tests. The discrepancies may be related to differences in the initial counts of the unpasteurized products or may be caused by recontamination of the pasteurized products.

From a microbiological point of view the Enterobacteriaceae test will be more related to the presence or absence of salmonellae than the alpha-amylase test.

From a more general hygienic point of view an egg product, which has such a high initial count that pasteurization will not be sufficient to make 0.1 of a gramme of the product free from Enterobacteriaceae, is not acceptable. Moreover, all measures should be taken to prevent recontamination and multiplication of surviving organisms in a properly pasteurized product. As a check on these points, only a microbiological test will be acceptable. That this test can be applied without causing too many troubles for the egg producers, is demonstrated by the fact that in only 12% of an additional 137 samples of pasteurized egg products examined in 1968 Enterobacteriaceae were present in 0.1 g; 6.7% of these Enterobacteriaceae positive samples did contain salmonellae in 20 g.

PROPOSED DRAFT PROVISIONAL CODE OF HYGIENIC PRACTICE FOR
POULTRY AND POULTRY PARTS

(Going forward to Step 5)

To be read in conjunction with the Recommended General Principles of Food Hygiene. Side-lined portions indicate material which is particular to this Code of Hygienic Practice and therefore does not appear in the General Principles of Food Hygiene.

SECTION I - SCOPE

This Code is concerned with all poultry and poultry parts intended for human consumption, whether by direct sale or through further processing, including carcasses which are unviscerated or prepared as "ready to cook."

It applies to all premises in which poultry is slaughtered, packed, or otherwise handled in the course of preparation, and all premises in which poultry parts are processed, packed, or otherwise handled in the course of preparation.

SECTION II - DEFINITIONS

- "Poultry" means any live or slaughtered domesticated bird including chickens, turkeys, ducks, geese, guinea-fowls, or pigeons.
- "Dressed poultry" means poultry which has been slaughtered for human food with head, legs, and viscera intact and from which the blood and feathers have been removed.
- "Dressed degutted poultry" means poultry which has been slaughtered for human food with head and legs intact and from which the blood, feathers and gut have been removed.
- "Ready-to-cook poultry" means any dressed poultry from which the vestigial feathers (hair or down, as the case may be), feet, head, crop, trachea, oesophagus, entrails, reproductive organs, and lungs have been removed, and with or without giblets, and is ready to cook without need of further processing. Ready-to-cook poultry also means any cut-up or disjointed portion of poultry or any edible part thereof, as described in this paragraph.

"Poultry parts"	means any edible part or parts of the poultry carcass.
"Offal"	means any tissue other than skeletal tissue and the skin and fat normally associated with it and includes the head, neck, feet and giblets.
"Edible offal"	means giblets and such other offal, e.g., necks and combs as may be accepted as edible by the consuming country.
"Giblets"	means the liver from which the bile sac (gall bladder) has been removed, the heart with or without the pericardial sac and the gizzard from which the lining and contents have been removed; provided that each such organ has been properly trimmed and washed.
"Evisceration"	means removal in whole or in part of the viscera.
"Immediate container"	includes any consumer package; or any other container in which poultry carcasses or poultry parts, not consumer packaged, are packed.
"Consumer package"	means any container in which poultry or poultry parts are enclosed for the purpose of display and sale to household consumers.

SECTION III - RAW MATERIAL REQUIREMENTS

A. Environmental Sanitation in Raw Food Material Production Areas.

NOTE: - Recommendations in this Section are not designed to cover the very important questions of hygiene and disease control in poultry growing and rearing areas. These factors have a particular bearing on this code but are the responsibility of the official agency having jurisdiction.

- (1) Sanitary disposal of human and animal wastes. As in the General Principles of Food Hygiene with the addition of:

Arrangements for the disposal of trade refuse and inedible offal should be approved by the appropriate official agency. A separate refuse room or other equally adequate storage facilities should be provided on the premises. All droppings, litter, scrapings, etc., from cages, crates, and vehicles should be removed in such a way as to protect against contamination and not create a nuisance.

- (2) Animal, plant pest and disease control. Where control measures are undertaken, treatment with chemical, biological, or physical agents should be done only in accordance with the recommendations of the appropriate official agency, by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of toxic residues being retained.

B. Sanitary Food Production.

- (1) As in the General Principles of Food Hygiene.
- (2) Sanitary techniques. Any live poultry holding section and attendant processes such as egg collection should be quite separate from the slaughtering and poultry packing section. This applies particularly to the disposal of refuse and storage of poultry feeding stuffs.

The premises should be cleared of all live poultry at least once weekly to facilitate complete and thorough cleansing. Birds should normally be slaughtered within 24 hours of arrival and any water fed to them should be of potable quality.
- (3) Removal of obviously unfit materials. On arrival and throughout the process, unfit birds should be removed as soon as possible and segregated for disposal in an appropriate manner.
- (4) As in the General Principles of Food Hygiene, but omitting the words "and the methods of harvesting."

C. Transportation.

- (1) Facilities. Conveyances and crates for transporting the live birds from the production area should be adequate for the purpose intended and should be of such material and construction as will permit thorough cleaning and should be so cleaned and maintained as not to constitute a source of contamination.

SECTION IV - PLANT, FACILITIES, AND OPERATING REQUIREMENTS

A. Plant Construction and Layout.

- (1) Location, size, and sanitary design.
 - (a) As in the General Principles of Food Hygiene, Section IV A (1), with the addition of the following: Whether existing buildings are being adapted or new premises are being built, early consultation with the appropriate official agency is essential.

A proper work flow is necessary to secure good hygiene standards. An example of a suitable work flow with physical separation of the processes is illustrated in Fig. 1 which can be adapted, according to requirements.

(b) Roadways and yards. Roadways and yards serving the premises should have a hard, paved surface which is suitable for wheeled traffic, and should have provision for thorough cleaning where necessary and adequate drainage.

(c) Walls, ceilings, and floors. Walls should be finished to a smooth, nonabsorbent, washable surface, be light in color, and the junction between walls and floor should be covered or splayed to facilitate cleaning. Ceilings should be so constructed and finished as to minimize condensation, mold development, flaking and the lodgement of dirt. Floors should be of durable, impervious non-slip material, free from cracks and open joints and laid to an even surface properly sloped to an adequate drainage system.

Buildings which have unlined roofs should be constructed and finished to minimize condensation, mold development, flaking, and dirt, in order to protect against contamination of the product.

(d) Woodwork, doors, and windows. Internal woodwork should be kept to a minimum, being of simple design, easy to clean, and be tight fitting to wall surfaces. Doors and jambs should, where necessary, be fitted on both sides with non-corroding metal or other suitable materials as a protection from impact damage, and doors where necessary should be fitted with self-closing devices. All external openings and doors and openable external windows should be equipped to exclude flying insects. Windowsills should be splayed at an angle.

(2) Sanitary facilities and controls.

(a) As in the General Principles of Food Hygiene.

(b) Water supply. An ample supply of both hot and cold water should be available of the potable quality referred to in the General Principles of Food Hygiene, Section IV A (2)(b). Where in-plant chlorination of water is used, the residual content of free chlorine should be maintained at an effective level.

(c) and (d) As in the General Principles of Food Hygiene.

(e) Plumbing and waste disposal. As in the General Principles of Food Hygiene, with the addition of the following: Sumps or solid matter traps included in the drainage system within the plant should be emptied and cleaned frequently and at the end of every working day. Every inlet into the drainage system should be trapped and no drain ventilation pipe should open into any room.

Any internal open channelling should be rounded and of sufficient width to allow for easy cleaning, and of minimum efficient depth. Covering grids should be easily removable for cleaning. Channels should be flushed frequently during processing and thoroughly cleaned at least once daily.

(f) Lighting and ventilation. As in the General Principles of Food Hygiene, with the addition of the following: Lighting should have an overall intensity of not less than 325 Lux (30 foot candles), and in inspection areas this should be increased to not less than 540 Lux (50 foot candles) and be properly directed onto the bird.

(g) and (h) As in the General Principles of Food Hygiene.

(i) Accommodation for clothing and footwear. Suitable and sufficient accommodation for keeping clothing and footwear not worn during working hours should be provided. Such accommodation should be separate from any processing room.

B. Equipment and Utensils.

(1), (2), and (3) As in the General Principles of Food Hygiene.

(4) Bleeding and blood collection. Bleeding equipment, including blood tunnels and blood containers, should be constructed of non-corrodable metal or other suitable material which is easy to clean. They should be thoroughly cleaned after major breaks during working periods and at the end of the day. Blood tunnels which are of solid wall construction should be properly tiled or otherwise smooth surfaced with impervious material, suitably drained, and of sufficient width and construction as to facilitate thorough cleaning. Metal tunnels should be fitted with side and head shields easily removable for cleaning and the base trough should have a suitable fall to a blood container which can be easily emptied and cleaned.

(5) Processing Equipment.

(a) Scalding should preferably be carried out by more hygienic methods than by the use of scalding tanks. Where such tanks continue to be used for immersing carcasses, the rate of flow of water into these tanks should provide for a continuous replacement of the water so as to protect against a buildup of contamination. Tanks should be emptied at regular intervals and at least once every working day. Scald agents where used should be approved by the official agency having jurisdiction.

(b) Plucking machines should be designed to control the scatter of feathers as much as possible. The removal of feathers from the site should preferably take place continuously or as often as necessary, throughout the working day. Feathers should be stored in suitable clean containers which should be removed at least once daily. Feathers removed by continuous running water should be removed from the water which should preferably be run to waste or if recirculated, suitably treated to protect against contamination.

(c) Perforated metal draining surfaces should be reversible for cleaning purposes.

- (d) Evisceration troughs should be constructed of stainless steel or other suitable material. The main water flow should be in the opposite direction to that in which carcasses are travelling so that the eviscerated carcass arrives for cooling at the point where clean water enters the trough. Additionally, trickle jets of clean water should be provided along both sides of the trough, and supplies of running water should also be provided over the trough for hand rinsing. Outlets for inedible offals should be provided in the troughs at suitable intervals where the length of the trough is more than 9 metres (30 feet).
- (e) Storage containers for inedible offal should be constructed of metal or other suitable impervious material which is easy to clean, and be covered with close-fitting lids. Where chutes or other continuous disposal methods are used they should be so constructed as to protect against contamination or offensive odours.
- (f) Equipment used for chilling the birds should be constructed of stainless steel or other suitable material and should be so operated as to protect against the buildup of micro-organisms in the cooling medium.
- (g) Compounds used in immersion or spray freezing procedures should be acceptable to the appropriate official agency.

C. Hygienic Operating Requirements.

- (1) Sanitary maintenance of plant, facilities, and premises. As in the General Principles of Food Hygiene, Section IV C (1), with the addition of the following:
 - (a) Cleaning routine. Cleaning, rinsing and disinfection of premises, equipment and utensils should be carried out at such intervals and by such methods as are approved by the appropriate official agency. Continuous review of the effectiveness of these procedures is recommended.
 - (b) To avoid the risk of cross-contamination, blood and feathers should be kept away from the plucked carcasses as they go on for further processing.
 - (c) Each process should be carried out in its own clearly defined area.
 - (d) Carcasses which are received rough plucked for further processing should be hung singly or arranged in single layers on racks, etc.
 - (e) When finishing and cleaning dressed poultry, the vestigial feathers (hair or down as the case may be) should be removed; feed should be removed from the crop and the faecal material from the cloaca by such means as will protect against contamination, e.g., by suction. These operations should be completed prior to, or during, the final washing.

- (iii) Chilling procedures. Any chilling procedure which will achieve the temperatures within the times quoted above and the objectives set out in IV B (5)(f), may be used. More hygienic methods of chilling than some presently in use or improvements to them should be developed.
- (iv) Refrigeration. Premises where poultry, poultry parts, and edible offals are kept should have adequate refrigerated storage.

The temperature in the storage area where non-frozen poultry, poultry parts, and edible offals are kept should preferably be as close to 0°C (32°F) as possible and under no circumstances exceed 5°C (40°F).

Poultry, poultry parts and edible offals should be so stored that they are protected against deterioration and mold growth. They should be regularly inspected and dispatched in strict rotation.

Cold rooms used for bulk storage should preferably be fitted with automatic defrosting equipment. Care should be taken to avoid the transference of dirt into the rooms.

- (v) Preservation by freezing. Poultry, poultry parts, and edible offals which are intended for preservation, by freezing, should be frozen as soon as possible and should not be held chilled for more than 72 hours.
- (vi) Ice-pak containers. When poultry is ice-packed in barrels or other containers, the barrels and containers should be covered and should have an adequate number of drain holes to permit the water to drain out. Wooden barrels or containers should not be used for this purpose.

- (4) Packaging of finished product. As in the General Principles of Food Hygiene, Section IV D (5).
- (5) Preservation of finished product. As in the General Principles of Food Hygiene, Section IV D (6).
- (6) As in the General Principles of Food Hygiene, Section IV D (7).

E. Sanitation Control Program.

As in the General Principles of Food Hygiene.

F. Laboratory Control Procedures.

As in the General Principles of Food Hygiene.

SECTION V - END-PRODUCT SPECIFICATIONS

As in the General Principles of Food Hygiene, Section V.

- (f) Wax dipped carcasses should be handled so that set wax and removed feathers will fall into a suitable container. Only clean wax which has been stored in a clean place should be used for wax dipping. Feather separation sieves included in wax dipping machines should be removable and cleaned once daily. At the close of the working day reclaimed wax should be heated [a temperature of not less than 80°C (176°F) for a period of not less than 20 minutes, has been found to be effective], skimmed, washed, and filtered or passed through a centrifugal cleaning machine and afterwards stored in a clean place.

(2), (3), (4), (5), and (6) As in the General Principles of Food Hygiene.

D. Operating Practices and Production Requirements.

(1) Inspection and sorting

- (a) Prior to introduction into the processing line, or at a convenient point within it, poultry should be inspected, sorted or culled as required to remove unfit birds. Such operations should be carried out in a clean and sanitary manner.
- (b) In order to maintain good hygienic conditions and to prevent hazards to the consumer, antemortem and postmortem inspections should be carried out by the appropriate official agency.

(2) Washing or Other Preparation

- (a) Carcasses should be washed as needed to remove contamination. Water used for such purposes should not be recirculated unless suitably treated to maintain it in a condition as will not constitute a public health hazard.

(3) Preparation and Processing

- (a) As in the General Principles of Food Hygiene, Section IV D (4).
- (b) Temperature and cooling and freezing procedures. Temperatures and procedures which are necessary for cooling and freezing dressed and ready-to-cook poultry, including all edible portions thereof, should be in accordance with operating practices which ensure the prompt removal of the animal heat and preserve the condition and wholesomeness of the poultry.
- (i) General cooling requirements. Poultry should be cooled immediately after preparation to an internal body temperature of 5°C (40°F) or less. The temperature should not exceed 10°C (50°F) during processes such as cutting up and should immediately be followed by cooling to 5°C (40°F) or less. Poultry which is to be held at the plant in excess of 24 hours should be so stored that an internal body temperature of 5°C (40°F) or less is maintained.
- (ii) Cooling giblets. Giblets should be chilled to 5°C (40°F) or lower within 2 hours from the time they are removed from the bird.

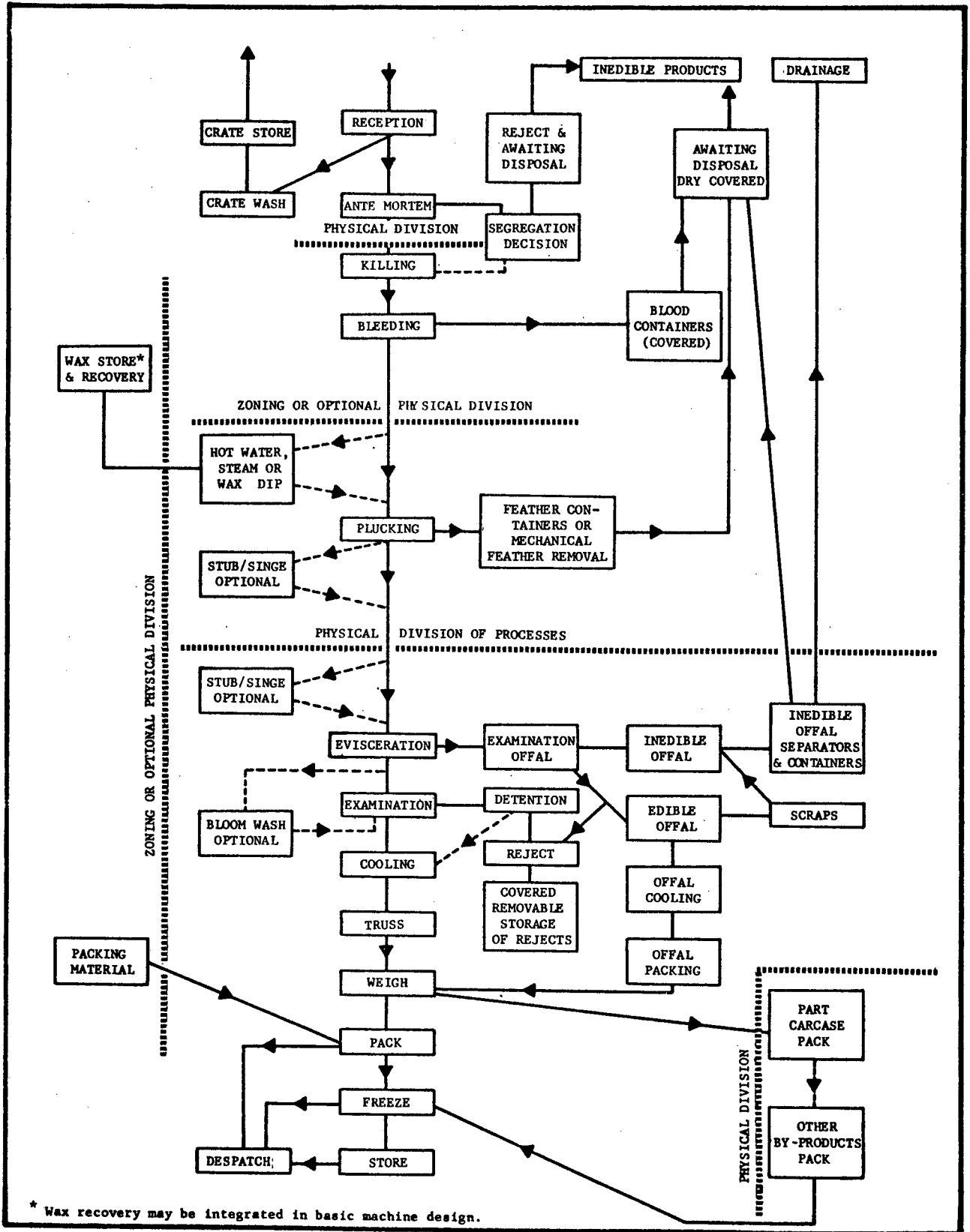


Fig. 1