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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS WORLD HEALTH ORGANIZATION



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Agenda Item 6

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX ALIMENTARIUS COMMISSION

Twenty-ninth Session, International Conference Centre, Geneva (Switzerland), 3 – 7 July 2006

LIST OF PROPOSED DRAFT STANDARDS AND RELATED TEXTS SUBMITTED AT STEP 5

PROPOSED DRAFT RECOMMENDED INTERNATIONAL CODE OF PRACTICE FOR THE PROCESSING AND HANDLING OF QUICK FROZEN FOODS

Codex Members and Observers wishing to submit comments on the above matter, including possible implications for their economic interests, should do so in conformity with the Uniform Procedure for the Elaboration of Codex Standards and Related Texts (Codex Alimentarius Commission Procedural Manual) **before** <u>10 JUNE 2006</u>. Comments should be directed to the Secretary, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, Viale delle Terme di Caracalla, 00100 Rome, Italy, Fax: +39 (06) 5705 4593, E-mail: <u>codex@fao.org</u> (*preferably*).

BACKGROUND

1. In compliance with the decision of the 28th Session of the Codex Alimentarius Commission (July 2005)¹, the U.S. Secretariat revised the proposed draft Recommended International Code of Practice for the Processing and Handling of Quick Frozen Foods in light of the comments submitted in response to CL 2005/39-CAC. Based on these comments, the U.S. Secretariat has prepared a revised text for adoption at Step 5 by the 29th Session of the Commission (July 2006). The revised text is appended to this document as Appendix I. Deleted texts are crossed out. New sentences are in bold and highlighted. Comments from Codex Members² submitted at Step 3 in response to CL 2005/39-CAC are compiled in Appendix II and have been kept in original language.

2. The Circular Letter particularly addressed a number of points with a view to advancing the Code in the Codex Step Procedure. These points and the discussion of the response to each question is presented below as follows:

(a) Comments on using the adopted language for the *Code of Practice for Fish and Fishery Products* regarding Defect Action Points (DAPs) Analysis and whether this will help alleviate concerns of developing countries.

Most Codex meeting documents are available on Internet at www.codexalimentarius.net

¹ ALINORM 05/28/41, paras. 87-88.

² Comments of Australia, Barbados, European Community, Japan, Malaysia, Thailand, United States of America and Venezuela.

For reasons of economy, this document is produced in a limited number of copies. Delegates and observers are kindly requested to bring it to the meetings and to refrain from asking for additional copies, unless strictly indispensable.

3. Most countries responding to this question agreed that using the adopted language from the Code of Practice for Fish and Fishery Products should be helpful. A country noted that this would ensure consistency of terminology in the safety and quality aspects embodied in the concepts of HACCP and DAPs in both documents. They suggested that more of the language from the Fish Code might be included with reference to explaining the purpose and application of the DAPs Analysis in relation to HACCP.

4. However, other countries continued to express disagreement with the DAP's concept. One of these countries believed that the provisions in the sections on quality aspects were sufficient for managing all quality aspects of quick frozen foods. A country believed that DAPs were non-essential quality aspects and should not be referenced in the Code. Another country suggested changing Defect Action Points (DAPs) to Control Points (CPs) in order to refer to quality not safety parameters and to have coherence with the general principles for food hygiene (GPFH) and Guidelines for applying HACCP.

5. The U.S. Secretariat noted the comments of the majority and maintained the DAPs Analysis in the Code of Practice.

(b) Comments addressing whether it is sufficiently clear in the proposed draft Code that the *Recommended International Code of Practice: General Principles of Food Hygiene* and its *Annex on Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application* covers concerns regarding safety in the quality provisions.

6. In general, those countries that responded to this question agreed that the *Recommended International Code* of *Practice: General Principles of Food Hygiene* and its Annex on HACCP System covered concerns regarding safety in the quality provisions. A suggestion was made to include a paragraph at the conclusion of the Introduction stating the relationship to this Code of Practice and the Food Hygiene Code. The U.S. Secretariat included that wording to make more explicit the relationship of both Codes.

(c) Further comments on clarification between "safety" and "quality" in the quality provisions, by identifying/separating "quality provisions" from those sections involving both quality and safety/hygienic aspects namely: Sections 1 - Objective; 2- Definitions; 3- Prerequisite Programme; and 6 - Temperature Management in the Cold Chain and its Annex III. Comments on the identified quality provisions if required³.

7. A number of countries believed that rather than clarification between "safety" and "quality" in these sections, there should be more inclusiveness of both "safety" and "quality" in them. They believed that arbitrary lines have been drawn between these factors. As an example, quality should be included along with safety in Section 1 — Objective. Also, "quality" should be added to the definition of Prerequisite Programmes in Section 2. Many see "quality" and "safety" as a continuum in Section 6 - Temperature Management. As no major redesign of the Code was envisioned, changes to incorporate some of these suggestions are noted below:

General Observation

8. Some countries, consistent with their comments regarding DAPs under point (a) of CL 2005/39-CAC, continued to request that mention of DAPs be deleted in relevant sections of the Code. Consistent with the decision to retain DAPs in the Code, those comments were not accepted.

Section 1 — Objective

9. A number of countries made suggestions concerning this Section. In particular, a number of the comments suggested that reference should be made in the Objective to the importance of the quality of the product. The U.S. Secretariat included language relating to the quality aspects of the Code.

Section 2 — Definition

10. <u>Cold Chain</u> — Several comments noted that this definition needed to be changed to reflect the fact that harvesting and slaughter were not related to maintaining the temperature of quick frozen foods. A suggestion to widen the definition by removing the words "quick frozen" was accepted by the U.S. Secretariat.

11. <u>Cold store</u> — A number of countries wished to clarify this definition. To this purpose, the term "establishment" was changed to "enclosed area".

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Section 4 on safety aspects of the cold chain control is not being considered at this stage. Hygienic/safety provisions will be considered by the Codex Committee on Food Hygiene when finalizing the Code as recommended by the Codex Alimentarius Commission.

12. <u>Defect Action Points (DAPs</u>) — A country suggested adding "essential" before "quality" in the definition which was accepted.

13. <u>Prerequisite programme</u> — Several countries suggested including quality aspects in this definition. This suggestion was included.

Section 3 — Prerequisite Programme

14. A Member Organization wished to add "and the optional use of a DAPs Analysis" to first sentence. While a country believed that prerequisite programmes could be based on either good hygienic or good manufacturing practices. However, as the Introduction to this Code stated that the prerequisite programmes covered the essential requirements of hygiene, the current wording remained.

Section 3.2.1 — Process Plant Design

15. A country suggested moving the last sentence to Section 5 as it had nothing to do with plant design. Another country wished to add "and safety" to the second sentence. This was added and the last sentence deleted.

Section 3.3 — Facilities

16. A country suggested deleting the current text as it was already covered in paragraph 3 of the Introduction. However, the U.S. Secretariat saw no harm in keeping the redundancy and did not delete the paragraph. In addition, a Member Organization suggested adding an additional point for Maintenance Regimes. This point was added to the Code (new Section 3.3.4).

Section 3.5 — Training

17. Some countries and a Member Organization suggested additional wording to strengthen this Section. The U.S. Secretariat made changes to the text to respond to these suggestions.

Section 6 — Temperature Management in the Cold Chain and its Annex 3

18. This Section was of concern for a number of countries because of its integration of both safety and quality issues. A country felt that Sections 6.1 - Temperature Monitoring and 6.2 - Temperature Violations both referred to Annex 3. Certain sections contained in Annex 3 there might be more appropriate for inclusion in Section 6. This country also recommended that the Codex Committee on Food Hygiene (CCFH) in review of food safety provision might determine changes to better separate the issues. On the other hand, another country would prefer safety and quality be more integrated in this Section and comment be made of the pertinence of temperature management to both quality and safety.

19. A country suggested removing the words "in accordance with national legislation" in Section 6.1-Temperature Monitoring and in the Introduction. This country was concerned that the words could create unjustified barriers to trade. However, the U.S. Secretariat retained the language in the text as it was found in many other Codex texts without creating trade problems. The last sentence of Section 1 - Objective stated that the national application of this Code required modification and amendments, taking into account local conditions and specific consumer requirements. This would apply also to the tolerances and DAPs.

Annex I: Table 1 — CCPs Description Sheet

20. There were a number of suggestions regarding Table 1. Several countries felt that the table should be describing the hazards associated with the processing step and that more examples of HACCP should be added to cover different groups of quick frozen foods. A country suggested changing the wording in column 4 (CCP Limit) and column 5 (Monitoring Procedure) to indicate that it was the temperature of the product, not the truck that should be of concern which was accepted.

(d) Further comments on the quality provisions in Section 5 - Cold Chain Control: Quality Aspects if necessary.

Section 5 — Control Cold Chain: Quality Aspects

21. A country suggested referring to the application of a HACCP approach in deciding quality controls in addition to the reference to a "systematic approach" as some business might feel comfortable using the same principles for both purposes.

Section 5.1 — Raw Materials

22. A country questioned whether all products required immediate preparation and suggested that the sentence be revised to reflect this. The proposed change was accepted.

Section 5.2 — Processing Before Freezing

23. A country suggested deleting the final sentence as it was unnecessary because the issue was addressed in the previous paragraph. The proposed change was accepted.

Section 5.3 — Quick Freezing Process

24. A country commented that there was confusion in the wording of the proposed new last sentence regarding the definition of the word "freezers' since it was defined in Section 2.2 - Definitions as being equipment not a gas. Therefore, the final sentence should be deleted which was done by the U.S. Secretariat.

25. Another country suggested moving parts of Section 5 into Section 4. A country reiterated that it would like reference to DAPs removed from Section 5 and Annex 2. Consistent with the decision to retain DAPs in the Code, those comments were not accepted. This country also proposed deleting "high humidity" as it was not critical to quality in frozen foods as compared to warm temperature. This proposed change was accepted.

Section 5.4 — Packaging and Labelling

26. A country suggested addition to the second dot point to indicate for clarity that the microbial and chemical contamination should apply to quality. The proposed change was accepted.

Section 5.6 — Transport and Distribution

27. A country suggested changing the wording of the second sentence in paragraph 2 replacing "the freezing process" to "temperature control" as the freezing process would already have taken place prior to Transport and Distribution. The proposed change was accepted.

28. Several countries were concerned about the apparent discrepancy between "the maximum rise of 3°C" and the -12°C and 18°C temperatures noted in this Section and in Section 5.7. This provision was deleted and replaced by a text referring the maximum rise of temperature to national legislational as long it was kept to a minimum necessary to keep the product temperature between the above-mentioned range.

Other Comments, including editorial comments

29. Several comments were received on Section 4 — Cold Chair Control: Safety Aspects. These were considered outside the mandate of the current revision of the Code and thus out of the scope of the CL request. Consequently, they were not included in the discussion. They can be brought up when the Code will be discussed in the Codex Committee on Food Hygiene as directed by the Codex Alimentarius Commission.

30. Other comments were made on the Introduction. A country suggested deleting the phrase in paragraph 4 "which can be sold on national or international markets and meet the requirement of Codex Standards". This was standard Codex language and remained in the Introduction.

31. Countries also provided editorial comments to clarify the meaning of the sentences, definitions and paragraphs. Some of the suggestions were included. Others were considered and deemed either redundant, unnecessary to clarify meaning, or not needed. Suggestions for changes in the French and Spanish versions will be taken up when finalizing the documents in these languages.

CONCLUSIONS AND RECOMMENDATIONS

32. Those Codex Members which sent comments in reply to CL 2005/39-CAC agreed that:

Point (a): comments on using the adopted language for the Code of Practice for Fish and Fishery Products regarding DAPs would help alleviate concerns of developing countries; and that

Point (b): it was sufficiently clear in the proposed draft Code that the Recommended International Code of Practice: General Principles of Food Hygiene and its Annex covered concerns regarding safety in the quality provisions.

33. The responses to points (c) clarification between "safety" and "quality" and (d) further comments on the quality provisions in Section 5 were mixed. The same confusion and disagreement between what constituted "quality" and what constituted "safety" remained from the previous iteration of the Code. While agreement was reached on some issues, a number of countries indicated that it would be good to move this discussion to the Codex Committee on Food Hygiene where the experts on safety could bring their expertise to bear.

34. In light of the fact that most of the Code has been agreed upon during this and previous iterations, the U.S. Secretariat would recommend that the Code of Practice be advanced to Step 5 and the remaining issues around temperature and other safety and safety/quality-related issues be discussed in the Codex Committee on Food Hygiene.

REQUEST FOR COMMENTS

35. Codex Members and Observers are invited to comment on the proposed draft Recommended International Code of Practice for the Processing and Handling of Quick Frozen Foods (at Step 5) as directed on the cover page.

36. In submitting comments, Codex Members and Observers are kindly reminded that they should be made in line with the decision of the Codex Alimentarius Commission namely those **quality provisions** identifed in points (c) and (d) of CL 2005/39-CAC (see paragraphs 6 and 20 of this document) with a view to its adoption at Step 5 at the 29^{th} Session of the Commission.

37. Codex Members and Observers are also kindly reminded that Section 4 on safety aspects of the cold chain control is not being considered at this stage. Hygienic/safety provisions will be considered by the Codex Committee on Food Hygiene when finalizing the Code as recommended by the Codex Alimentarius Commission.

APPENDIX I

6

PROPOSED DRAFT REVISED RECOMMENDED INTERNATIONAL CODE OF PRACTICE FOR THE PROCESSING AND HANDLING OF QUICK FROZEN FOODS

(AT STEP 5)

INTRODUCTION

This *Code of Practice for Processing and Handling of Quick Frozen Foods* is a revised version of the Recommended International Code of Practice for the Processing and Handling of Quick Frozen Foods (CAC/RCP 8-1976), including Annex I-1978: Method for Checking Product Temperature, and Annex II-1983: Recommended International Code of Practice for the Handling of Quick Frozen Foods during Transport.

This Code of Practice has been modified to incorporate the Hazard Analysis and Critical Control Point (HACCP) approach described in the latest edition of the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969) and its Annex: *HACCP System and Guidelines for its Application*, which are designated hereinafter as GPFH. A prerequisite programme is described in the Code covering technological guidelines and the essential requirements of hygiene in the production of quick frozen food products, which are safe for human consumption, and otherwise meet the requirements of the appropriate Codex commodity standards. The Code also contains guidance on the use of HACCP, which is recommended to ensure the hygienic production of quick frozen food products to meet health and safety requirements.

Since the Code is intended to cover not only those hazards associated with safety but to include other aspects of production including the essential product quality, composition and labelling provisions as described in commodity standards developed by the Codex Alimentarius Commission, not only are critical control points (CCP) described but also defect action points (DAP) are included in the Code. The HACCP principles may be applied to the determination of a DAP, with quality instead of safety parameters being considered at the various steps. However, DAP analysis is optional and other techniques which achieve the same objective may be considered.

This Code will assist all those who are engaged in the processing and handling of quick frozen foods or are concerned with their storage, transportation, retailing, export, import and sale in attaining safe and wholesome products which can be sold on national or international markets and meet the requirements of the Codex standards.

The Code only covers quick frozen foods. Quick frozen foods should have undergone the appropriate quick freezing process, and should be maintained at -18° C or colder at all points in the cold chain. Tolerances to this temperature may apply in accordance with national legislation.

The provisions of this document are supplemental to and must be used in conjunction with, the latest edition of the Recommended International Code of Practice-General Principles of Food Hygiene (CAC/RCP 1 – 1969).

1. **OBJECTIVE**

The aim of this Code is to provide background information and guidance for the elaboration of quick frozen food production and cold chain management systems that incorporate Good Manufacturing Practices (GMPs) as well as the application of HACCP for safety concerns and Defect Action Point (DAP) or equivalent measures for quality assurance. In addition, the Code may be used for training of employees of the quick frozen food industry. The national application of this Code requires modifications and amendments, taking into account local conditions and specific consumer requirements.

2. SCOPE AND DEFINITIONS

2.1 SCOPE

This Code of Practice applies to the processing, handling, storage, reception and distribution, and retailing of quick frozen foods.

2.2 **DEFINITIONS**

The definitions listed below are for the purpose of this Code only:

Blanching	A heat treatment sufficient to inactivate certain enzymes.
Chilling	The process of cooling food to an appropriate temperature, often 5°C or colder, but avoiding any formation of ice crystals.
Cold chain	A term embracing the continuity of successively employed means to maintain the temperature of quick frozen foods from harvesting, slaughter, production to retailing.
Cold store	An establishment Enclosed area used for the preservation of foods under refrigerated/frozen conditions.
Defect	A condition found in a product that fails to meet essential quality and/or labelling provisions of the appropriate Codex commodity standard.
Defect Action Point (DAP)	A step at which control can be applied and an essential quality (non-safety) defect can be prevented, eliminated or reduced to an acceptable level, or the risk of mislabelling can be eliminated.
Defrost cycle	An operation intended to eliminate the frost deposit from the surface of a cooling coil.
Dehydration	Loss of moisture from quick frozen food products through sublimation.
FIFO "First in-First out"	The first to arrive is the first taken out.
Freezer	Equipment designed for freezing food products by lowering the temperature quickly.
Ice glazing	The application of a protective layer of ice formed at the surface of a frozen product by spraying it with, or dipping it into, potable water, or potable water with approved additives, as appropriate.
K coefficient	The overall coefficient of heat transfer which represents the insulating capacity of the equipment.
Potable water	Water fit for human consumption. Standards of potability should not be lower than those contained in the latest edition of the <i>Guidelines for Drinking Water Quality</i> of the World Health Organization.
Prerequisite programme	Programme required prior to the application of the HACCP system to ensure that any component of the cold chain is operating according to the latest edition of the Codex <i>Recommended International Code of Practice: General Principles of Food</i> <i>Hygiene</i> , the appropriate Codex Codes of Practice and appropriate food safety and quality legislation.
Processing facility	Any premises where quick frozen food products are prepared, processed, frozen, packaged or stored.
Quick freezing process	A process which is carried out in such a way that the range of temperature of maximum ice crystallisation is passed as quickly as possible. The quick freezing process shall not be regarded as complete until and unless the product temperature has reached -18 °C or lower at the thermal centre, after thermal stabilisation.
Quick frozen food	Food which has been subjected to a quick freezing process, and maintained at -18° C or lower in the cold chain, subject to permitted temperature tolerances, and labelled as such.

Raw material	Fresh or processed food which may be utilized to produce quick frozen food products intended for human consumption.
Refrigeration system (unit, plant)	Equipment which supplies a source of cold to reduce the temperature of food or maintain food at frozen temperature.
Return air	Air returning to the air cooler.
Temperature abuse	Warming of quick frozen food to a temperature outside any permitted tolerance, so that it may adversely affect essential quality or safety of the food.
Temperature monitoring	The act of conducting a planned sequence of observations or measurements of the temperature of the refrigerated systems and/or quick frozen foods.
Temperature Indicator (TI)	A device which on activation exploits a physical or physico-chemical reaction to produce an observable and irreversible change once a predetermined threshold temperature has been reached.
Thermal centre	The point within a piece of food which has the highest temperature at the end of a quick freezing process.
Time-Temperature Indicator (TTI)	A device which indicates the time-temperature history experienced from its point of initial activation.
Tolerances	Short term fluctuations of temperature of the product in the cold chain, within limits permitted in the Code of Practice and which do not affect safety and quality.
Traceability/ Product Tracing	The ability to follow the movement of a food through specified stage(s) of production, processing and distribution.
Transfer point	Point at which the food is transferred between two points in the cold chain, while its temperature is maintained at regulation levels.

3. PREREQUISITE PROGRAMME

Prior to the application of HACCP to any segment of the quick frozen food chain, that segment should be supported by prerequisite programmes based on good hygienic practice (and good manufacturing practice). Prerequisite programmes should be specific within an individual establishment, and should require monitoring and evaluation to ensure their continued effectiveness.

Reference should be made to other relevant Codex Codes of Practice for further information to assist with the design of the prerequisite programmes for a processing facility.

In addition to the GPFH the following specific prerequisite provisions shall apply:

3.1 LOCATION

Processing facilities should be located so as to minimize quality changes of perishable raw materials for quick frozen foods prior to freezing.

3.2 FACILITY DESIGN AND CONSTRUCTION

3.2.1 <u>Process Plant Design</u>

The food processing facility should be designed for the rapid processing, freezing and storage of food products. The processing facility should include a product flow that is designed to minimize process delays that could result in reduction in affect food quality and safety. Many raw materials and food products are highly perishable and should be handled carefully to maintain their quality until the freezing process is initiated.

3.2.2 Cold Store Design

The cold store walls, floor, ceiling, and doors should be properly insulated in order to help maintain product temperatures. It is important that the design of the cold store ensures that:

- adequate refrigerating capacity provides and maintains a product temperature of -18°C or colder;
- air is distributed uniformly around the stored foods;
- temperatures are controlled and recorded on a regular basis;
- loss of cold air and introduction of warm and humid air are avoided; and
- leaks of any refrigerant should be prevented.

3.2.3 Equipment Design and Construction

The equipment should be designed and constructed in such a manner that physical damage to the raw materials and product is minimized, e.g. by ensuring there are no sharp inside corners or projections. Freezers should be designed and constructed so that, when properly operated, they meet the requirements of a quick freezing process.

3.3 FACILITIES

In addition to the recommendations of the GPFH, the following provisions shall apply:

3.3.1 <u>Provision of Services</u>

3.3.1.1 Electricity

In the case of power losses, the facility should have a contingency plan to maintain the temperature of the quick frozen foods.

3.3.2 <u>Cleaning Programmes</u>

The recommendations of the relevant sections of the GPFH apply.

3.3.3 <u>Pest Control Systems</u>

The recommendations of the relevant sections of the GPFH apply.

3.3.4 <u>Maintenance Regimes</u>

Proper maintenance and repair of any damage to the cold store and its infrastructure should ensure that insulation and refrigeration performance is maintained (e.g. prevention of rust, etc.)

3.4 PERSONAL HYGIENE AND HEALTH

The recommendations of the relevant sections of the GPFH apply.

3.5 TRAINING

Staff should have the skills and knowledge appropriate to their work to ensure that safety and quality of foods is not adversely affected during handling. Staff should also be aware about the importance of good maintaining temperature control for frozen foods to maintain the quality and safety of the foods. Training programs should be in place (either formal training courses or training provided whilst working) to ensure that staff have these skills and knowledge.

3.6 RECALL PROCEDURES AND TRACEABILITY/PRODUCT TRACING

3.6.1 <u>Recall Procedures</u>

Effective documented procedures should be in place to enable rapid recall of any lot of quick frozen foods from the retail establishment.

The recommendations of the relevant sections of the GPFH apply.

3.6.2 <u>Traceability/Product Tracing</u>

Traceability/Product Tracing is essential to an effective recall procedure and is a necessary component of a prerequisite programme because no process is fail-safe.

The traceability/product tracing system should:

- enable withdrawal of products that may pose a risk to consumer health by appropriate recall procedures;
- facilitate the identification of the producing/manufacturing history (one step forward, one step back) of the product to identify the source of the problem and apply corrective measures.

4. COLD CHAIN CONTROL: SAFETY ASPECTS

Each operation in the cold chain, where appropriate, should develop its own HACCP plan. This plan should be developed in accordance with the recommendations of the Annex to the GPFH.

An example on the use of Critical Control Points (CCPs) in production and distribution of a quick frozen product, i.e. quick frozen chicken nuggets, is given in Annex 1 for illustration purposes only.

4.1 RAW MATERIALS

Freezing should not be considered as a lethal treatment for microbiological contamination in foods. However, freezing may result in the death of certain microorganisms and will inhibit the growth of others.

The raw materials used should be safe and wholesome. Receiving is often considered as a CCP. For highly perishable products, such as in the example in Annex 1, temperature control at reception may also be considered as a CCP.

Producers of quick frozen food should as far as practicable implement measures to control contaminants, fertilizers, veterinary drugs, pesticide residues, industrial contaminants, etc. in raw materials according to the recommendations of the relevant sections of the GPFH.

4.2 **PROCESSING BEFORE FREEZING**

Raw materials may be processed in many ways before freezing, e.g. cleaning, sorting, cutting, slicing, conditioning, ageing, filleting, and heating. Whether or not such processes should be regarded as CCPs depends on the actual conditions, especially on how much time the food spends in the critical temperature zone, i.e. between 10° C and 60° C.

If storage of foodstuffs (raw material or intermediates) prior to further processing is necessary, the storage conditions, especially temperature, should be appropriate to the foodstuff concerned.

The heat treatment of many pre-cooked foods, e.g. prepared meals, should be sufficient to ensure inactivation of pathogens of most concern. In such cases, the time-temperature treatment and subsequent cooling may be considered as CCPs, see Annex 1.

If frozen raw materials are used and a thawing process is included, the thawing method should be clearly defined, and the thawing schedule (time and temperature parameters) should be carefully monitored. Selection of the thawing method should take into account the thickness and uniformity of size of the products in particular. Thawing time/temperature and food temperature critical limits should be selected so as to control the development of microorganisms. Thawing time and temperature parameters may be a CCP.

4.2.1 <u>Treatment of Products for Parasites</u>

In products intended for raw consumption or not fully cooked prior to consumption, freezing can be used to control hazards in fish from live helminth (nematode, trematode, cestode) parasites, such as anasakine nematodes and trichinae in pork. Freezing may serve as a control mechanism when developing HACCP plans for marinating, pickling, or other final preparations which do not supply sufficient heat from cooking to inactivate any potentially harmful parasites. The conditions required for effective parasite control using freezing include the final temperature and time of holding in the frozen state. These parameters vary depending on a number of factors which may include the host species, species of parasite, thickness of the product, and arrangement of product in the freezer

4.3 QUICK FREEZING PROCESS

When large lots of food are frozen or where the food consists of large pieces e.g. whole turkeys, it is necessary to provide spaces or channels permitting air circulation between the food or the cartons. If such air channels are not provided, the very mass of the food may be such that in spite of rapid air blast and low air temperatures, the inner parts of the lot chill and freeze slowly. It is important that the thermal centre of the product is chilled as quickly as possible to prevent the outgrowth of pathogenic microorganisms or the production of microbial toxins. Freezing time may be a CCP.

5. COLD CHAIN CONTROL: QUALITY ASPECTS

The Code is intended to cover not only safety aspects of quick frozen foods but also other aspects of production including the essential product quality and labelling provisions as described in commodity standards developed by the Codex Alimentarius Commission. Therefore, Defect Action Points (DAPs) are included in the Code. In the determination of DAPs, quality parameters are considered at the various steps by applying a systematic approach.

An illustrative example on the use of DAPs in production and distribution of a quick frozen product, i.e. quick frozen chicken nuggets, is given in Annex 2. The approach for DAP analysis is optional and other techniques, which achieve the same objective, may be considered.

5.1 **RAW MATERIALS**

Freezing cannot improve quality, and it is necessary to use raw materials of optimum quality. Products to be frozen should be selected according to their freezing suitability.

Products for processing and quick freezing must be prepared without delay, **if required**, and **appropriate** temperature control should be applied in order to minimize possible chemical or biochemical changes **that might affect quality**. If frozen raw materials are used and a thawing process is included, the thawing method should be clearly defined, and the thawing schedule (time and temperature parameters) should be carefully monitored. Selection of the thawing method should take into account the thickness and uniformity of size of the products in particular. Thawing time and temperature parameters may be a DAP.

5.1.1 <u>Microbiological Aspects</u>

Initial microbial numbers in products to be frozen should be kept as low as possible as this helps to obtain an appropriate storage life, by reducing problems with, for instance, off-taste, undesirable flavours or colours during frozen storage.

5.1.2 Other Raw Materials Quality Aspects

5.1.2.1 Other Quality Measures

To minimize deterioration, raw materials should be cooled and stored under appropriate conditions (e.g. precooling) or transported and frozen in the shortest time possible.

Procedures should be in place to ensure quality of incoming materials.

Producers should have procedures in place to sort and segregate foods and food ingredients, which are evidently unsuitable for further processing.

5.2 **PROCESSING BEFORE FREEZING**

Raw materials may be processed in many ways before freezing, e.g. cleaning, sorting, cutting, slicing, conditioning, ageing, scalding, filleting, and heating. Consideration should be given with regard to any of these processes whether or not they should be regarded as DAPs.

Blanching is often used in the production of frozen vegetables and other products to inactivate enzymes that would cause quality problems (taste, colour) during frozen storage. The blanching schedule should be determined to ensure the desired quality outcome, and may be a DAP.

Glazing, to limit dehydration during frozen storage should be addressed.

If storage of intermediate ingredients prior to further processing is necessary, the storage conditions, especially temperature, should be appropriate to the foodstuff concerned and take into account their future use or further processing as necessary.

If frozen intermediate materials are used in processing, temperature control and monitoring should be applied as appropriate.

5.3 QUICK FREEZING PROCESS

The quick freezing process should be performed in such a manner as to minimize physical, biochemical and microbiological changes, by taking into account the freezing system or process and its capacity, nature of the product (conductivity, thickness, form, initial temperature) and volume of production. With most products this is best achieved by ensuring that the product passes quickly through the temperature range of maximum ice crystallization, usually -1°C to -5°C at the thermal centre of the product. During the quick freezing process raw material should not get in contact with freezers other than air, nitrogen or carbon dioxide.

The quick freezing process should not be regarded as complete until and unless the product temperature has reached -18°C or colder at the thermal centre after thermal equilibration. On exit from the freezing apparatus, the product should not be exposed to high humidity and/or warm temperatures, and should be moved to a cold store as quickly as possible. The same applies to products that are retail packed after the quick freezing process.

5.4 PACKAGING AND LABELLING

In general, the packaging should:

- protect the product against dehydration;
- protect the food against microbial and other contamination **that could adversely affect quality**;
- protect the sensory and other quality characteristics of the food; and
- not add to the food any substance which may influence the quality of the food.

The packaging or re-packing of quick frozen foods should be carried out in such a manner that an increase in temperature within the authorized tolerances of the quick frozen foods does not adversely affect the quality of the product.

Packed quick frozen foods should comply with the requirements of the latest edition of the *Codex General Standard for the Labelling of Prepackaged Food* (CODEX STAN 1-1985).

5.5 FROZEN STORAGE

Cold stores should be designed and operated so as to maintain a product temperature of -18°C or colder with a minimum of fluctuation, see Section 3.2.2. The temperature of the cold store may be a DAP.

Stocks should be rotated to ensure that the products leave the cold store on a "First in-First out" basis (FIFO).

5.6 TRANSPORT AND DISTRIBUTION

The transport of quick frozen foods should be carried out in suitably insulated equipment, which maintains a product temperature of -18°C or colder. The product temperature during transport and distribution may be a DAP.

Vehicle compartments or containers should be pre-cooled prior to loading. Care should be taken not to impair the efficiency of the freezing process temperature control or reduce the refrigeration capacity

The user of the vehicle or container should ensure:

- adequate supervision of product temperatures at the moment of loading;
- effective tight stowage of the load in the vehicle or the container to protect the cargo against heat entering from outside;
- efficient operation of the refrigerating unit during transit, including the correct thermostat setting;
- an appropriate method of unloading at the points of arrival (particularly the frequency and duration of door openings);
- proper maintenance of the insulated body and the refrigeration system;
- proper cleaning of the vehicle or container.

However, a brief temperature rise of a maximum of 3°C of the product during transport may be tolerated. In this case, if the temperature of any product is warmer than -18°C, the temperature should be cooled to -18°C as soon as possible either during transport or immediately after delivery. Distribution of quick frozen foods should be carried out in such a way that any rise in product temperature warmer than -18° be kept to a minimum, within the limit set by national legislation, should not in any care be warmer than -12°C in the warmest pack.

Loading into and unloading from vehicles and loading into and unloading from cold stores should be as fast as practicable and the methods used should minimize product temperature rise.

Distribution of quick frozen foods to retailers and catering establishments should be carried out in such a way that any rise in product temperature warmer than -18°C be kept to a minimum, within the limit set by national legislation, and should not in any case be warmer than -12° C in the warmest pack. After delivery, the product temperature should be cooled to -18°C as soon as possible.

5.7 **RETAIL SALE**

Quick frozen foods should be offered for sale from refrigerated cabinets designed for the purpose. Cabinets should be capable of maintaining and be so operated as to maintain a product temperature of -18° C. A rise in product temperature may be tolerated for short periods, with any rise warmer than -18° kept to a minimum, within the limit set by national legislation, and should not in any case be warmer than -12° C in the warmest pack. Temperature in the cabinet may be a DAP.

Display cabinets should be equipped with an appropriate temperature measuring device, see Annex 3, Section 1.4.

Cabinets should be located so that the open display area is not subject to draughts or abnormal radiant heat (e.g. direct sunlight, strong artificial light or in direct line with heat sources).

Defrost cycles should be programmed in such a way that, as far as possible, defrosting takes place outside peak shopping periods.

The content of the cabinet should never be stocked outside the load line.

Stocks should be rotated to ensure that the products are sold on a "First in-First out" basis (FIFO).

The retail establishment should have an appropriate back-up storage room for quick frozen foods that allows products to be kept at a temperature of -18°C or colder.

5.8 TRANSFER POINTS

Attention should be paid to moving quick frozen foods as rapidly as is reasonably practicable from cold store to vehicle/container, or from vehicle/container to holding store, or from holding store to display cabinets. Often, transfer of responsibility (ownership) occurs at the same time.

- Quick frozen foods should not be left for any significant length of time at ambient temperature-and humidity.
- Procedures should be established for dispatching loads and for immediate storage of food upon arrival, in order to minimize exposure to humidity, elevated temperatures or other adverse conditions.
- It should be established that all personnel are following such procedures.
- The temperature of quick frozen food should be checked as it is received or dispatched, and a record of these measurements retained for a period that exceeds the shelf-life of the product.
- Operations (such as casing, order assembly, palletizing, etc.) should be carried out in the cold store or in a suitably temperature controlled area.

6. TEMPERATURE MANAGEMENT IN THE COLD CHAIN

6.1 **TEMPERATURE MONITORING**

Operators should ensure that appropriate systems which cannot be tampered with are in place to monitor air temperatures during the freezing process and to monitor temperature along the cold chain in order that quick frozen foods are maintained at -18°C or colder. National tolerances may apply.

Records of these measurements should be kept for a period that exceeds the shelf-life of the product.

Technical advice is given in Annex 3.

6.2 **TEMPERATURE VIOLATION**

When quick frozen foods are inspected a stepwise approach is recommended, see Annex 3.

Loads or parts of loads that are warmer than the temperature required for quick frozen food should be identified and sorted immediately. Delivery, removal and sale of these loads or parts of loads should be suspended. It is the responsibility of the person in possession of the food to ensure that its temperature is brought down immediately, and, more generally, to take any necessary measures for preserving the food.

In such cases, the supplier should be informed immediately by the person in possession of the food that an incident may have occurred. The buyer, if his or her identity is known, should be informed that an incident may have occurred. Even if not responsible for loading the goods, legally the buyer is the receiver of the goods and must therefore be notified of any incident affecting him or her.

ANNEX 1: ILLUSTRATIVE EXAMPLE ON THE APPLICATION OF CCPs IN A QUICK FROZEN FOOD INDUSTRY

Each step should be analyzed in order to decide if a CCP is necessary.

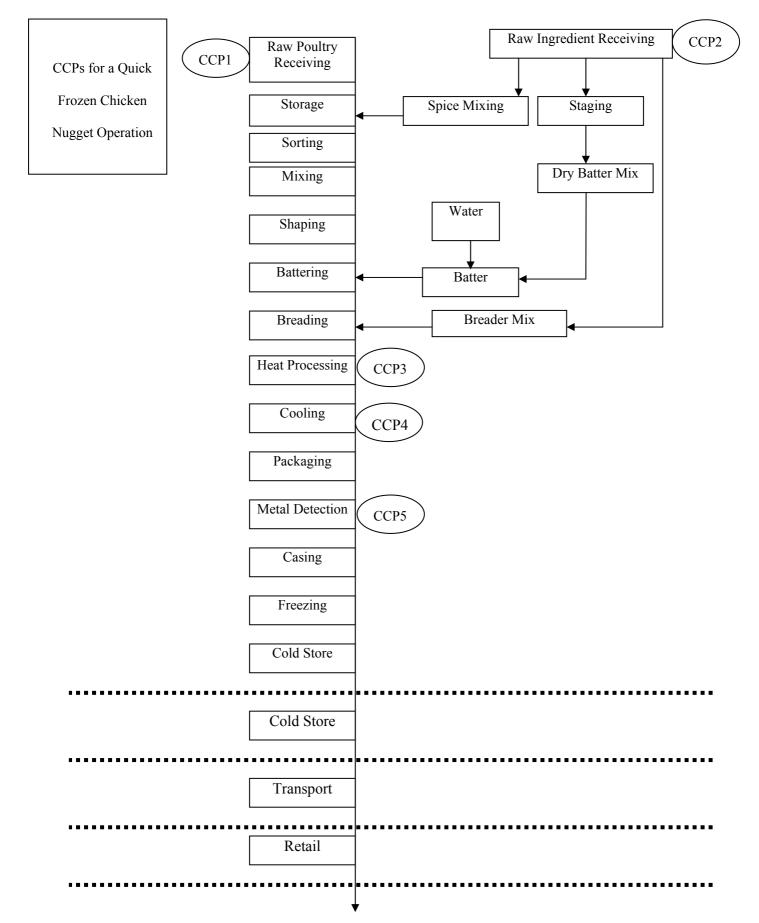
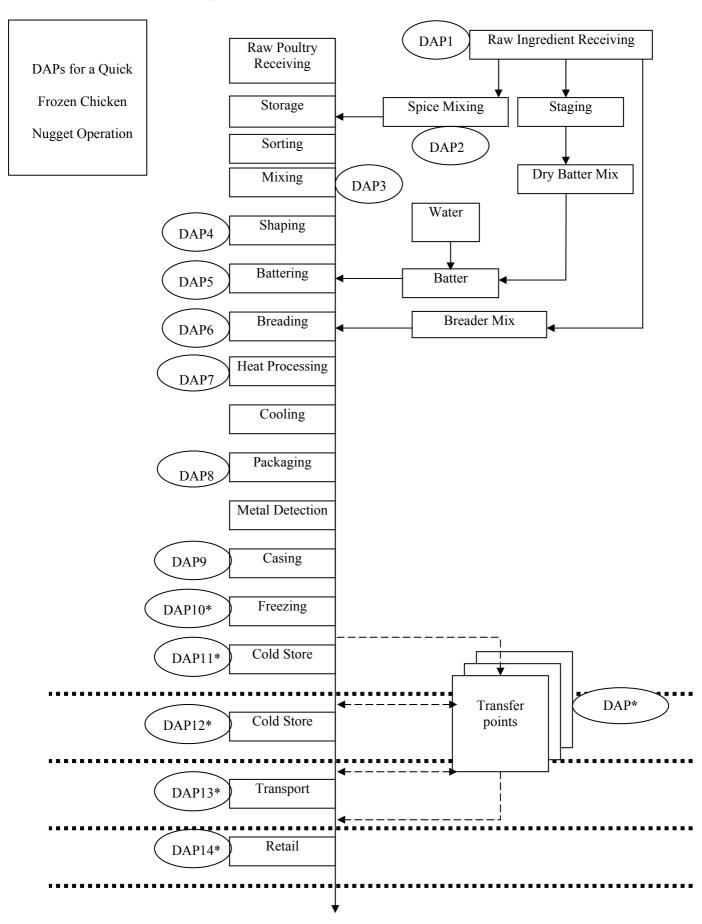


Table 1. CCPs description sheet

CCP Number	Process Step	Hazard Description	CCP Limit (if any)	Monitoring Procedure	Corrective Actions	Records
1 Temperature monitoring	Raw poultry Receiving	Biological – proper receiving temperatures of uncooked poultry.	Trucks Produce must meet maximum specified temperature.	Incoming truck-produce temperatures monitored for each received shipment of poultry. Outrun reports from vendor meet company specifications.	Evaluate product: hold, release or reject. Receiving clerk, supervisor and QA.	Incoming materials inspection form. Receiving clerk.
2 Physical inspection	Receiving of other sensitive ingredients.	Acceptable physical hazard levels including bone level in chicken and foreign material in coating ingredients.	Specified maximum bone level in received chicken. Coatings conform to specifications for foreign materials.	Outrun reports from each vendor show product meets specifications. Must be with each shipment.	Evaluate product: hold, release or reject. Receiving clerk, supervisor and QA.	Incoming materials inspection form. Receiving clerk.
3 Fryer and oven temperatures	Heat processing (fryer/oven).	Biological hazards in cooked chicken.	Chicken must be cooked to a specified minimum core temperature for specified time period.	Temperature record to monitor temperature of oven. Oven and product temperatures checked at specified intervals.	If limits exceeded hold production for biological evaluation: release, reprocess or destroy. Investigate causal factors and correct. Supervisor and QA.	Temperature record must be initialled by operator. Product log to be initialled by QA personnel.
4 Cooling	Cooling to chill temperature.	Biological hazards in finished product.	Product must be cooled to specified temperature within specified time.	Monitoring the cooling system, e.g. temperature record, checking stacking method. Product temperature checked at specified intervals.	If cooled too slowly, hold production for biological evaluation: release, reprocess or destroy. Investigate causal factors and correct. Supervisor and QA.	Temperature record must be initialled by operator. Product log to be initialled by QA personnel.

CCP Number	Process Step	Hazard Description	CCP Limit (if any)	Monitoring Procedure	Corrective Actions	Records
5 Metal detector	Metal detection.	Physical hazard in finished product.	Detection of metal to specified size and type.	Continuous operation. Line checked at specified intervals using defined standard.	Line stopped until corrected. Product from last line check must be passed through second operating detector. Supervisor and QA.	QA metal detector record. QA personnel.

ANNEX 2: ILLUSTRATIVE EXAMPLE ON THE APPLICATION OF DAPS IN A QUICK FROZEN FOOD INDUSTRY



Each step should be analyzed in order to decide if a DAP is necessary.

Table 2. DAPs description sheet

DAP Number	Defect Description	DAP Limit (if any)	Monitoring Procedure	Corrective Actions	Records
1 Receiving of sensitive ingredients	Check identity and wholesomeness.	Non-conformance for identity or wholesomeness.	Visual and sensory inspection. Outrun reports from each vendor meets specifications.	Evaluate product: hold, release or reject. Receiving clerk, supervisor and QA.	Incoming materials inspection form. Receiving clerk.
2 Spice mixing	Non-uniform spice mix.	Obvious non-uniform distribution of components.	Visual check for uniform distribution of component spices.	Evaluate product: remix if needed. Line operator and QA.	Production record completed.
3 Mixing	Non-uniform mix of components.	Obvious non-uniform distribution of components.	Visual check for uniform distribution of components.	Evaluate product: remix if needed. Line operator and QA.	Production record completed.
4 Shaping or forming	Non-conformity to specified shape and weight.	Misshapen form. Weight within specified limits.	Visual assessment for shape. Formed product weighed (e.g. 5 samples per 30 min).	Evaluate product: return product for rework. Line operator and QA.	Production record completed.
5 Battering	Incomplete coverage.	Incomplete coverage.	Visual assessment.	Evaluate product: investigate causal factors and correct. Line operator and QA.	Production record completed.
6 Breading	Incomplete coverage.	Incomplete coverage.	Visual assessment.	Evaluate product: investigate causal factors and correct. Line operator and QA.	Production record completed.
7 Heat processing	Overcooked colour and blow-out (loss of coating).	Colour darker than specified. Product greater than specified percentage with non- continuous coating.	Visual assessment against colour standards and detection of blow-out.	Evaluate product: investigate causal factors and correct. Line operator and QA.	Production record completed.
8 Packaging	Product does not conform to label weight.	Product weight less than label weight.	Product weight checked (e.g. 5 samples per 30 min).	Evaluate product: hold, release or reject. Supervisor and QA.	Production record completed.

DAP Number	Defect Description	DAP Limit (if any)	Monitoring Procedure	Corrective Actions	Records
9 Casing	Incorrect number of packs per outer. Ineffective carton closure.	Pack number conforms to label. Ineffective pack closure.	Physical check for closure and number of packs per carton.	Evaluate product: hold, release or reject. Supervisor and QA.	Production record completed.
10 Freezing*	Not frozen to -18°C within specified time.	Outside specified time.	Measure product temperature after freezing.	Evaluate product: hold, release or reject. Supervisor and QA.	Production record completed.
11 Cold store at the processing facility*	Excessive quality loss due to high storage temperature.	Product temperature warmer than -18°C.	Temperature record to monitor temperature of cold store.	If limits exceeded hold production for biological evaluation and sensory evaluation: release or destroy. Investigate causal factors and correct. Cold-store supervisor and QA.	Temperature record must be initialled by supervisor.
12 Cold store*	Excessive quality loss due to high storage temperature.	Product temperature warmer than –18°C.	Temperature record to monitor temperature of cold store.	If limits exceeded hold production for biological evaluation and sensory evaluation: release or destroy. Investigate causal factors and correct. Supervisor and QA.	Temperature record must be initialled by supervisor.
13 Transport*	Excessive quality loss due to high storage temperature.	Product temperature warmer than –18°C.	Temperature record to monitor temperature of vehicle/container.	If limits exceeded hold production for biological evaluation and sensory evaluation: release or destroy. Driver and QA.	Temperature record to be initialled by driver.
14 Retail storage*	Excessive quality loss due to high storage temperature.	Product temperature warmer than –18°C.	Temperature monitored at regular intervals.	If limits exceeded hold production for biological evaluation and sensory evaluation: release or destroy. Supervisor.	Temperature record completed by supervisor.

(*) <u>Note</u>: Each transfer point between DAPs 10 to 14 could also be considered as a DAP with similar defect description, DAP limit, monitoring procedure, corrective actions, and record keeping as in each of these DAPs.

ANNEX 3: TEMPERATURE MONITORING AND CONTROL IN THE COLD CHAIN

INTRODUCTION

Temperature monitoring is an integral part of the management of the cold chain. In general operators have a choice of monitoring systems for quick frozen products, which includes measurement of operating air temperatures of the refrigerating systems, or direct/indirect measurement of product temperature or a simulated product temperature.

In air temperature monitoring fixed temperature sensors are used to monitor the air temperature in the refrigerated system. Product temperature may be measured directly or indirectly. Direct measurements of product temperature may be undertaken destructively or non-destructively.

Although product temperature measurement can give more confidence that temperature requirements are being complied with, this approach is often not practical during busy production and distribution period.

1. AIR TEMPERATURE MONITORING

Air temperature monitoring permits:

- the use of fixed temperature sensors, which are normally protected from damage during commercial activity;
- problems occurring in the system to be diagnosed;
- process management using data storage on computers, and can be linked to other operating information such as defrost cycles, door openings, energy consumption and even production batch codes.

1.1 AIR TEMPERATURE MONITORING EQUIPMENT

Electronic thermometers consist of a sensor (placed in the cold air), and a read-out or recording system. The sensor can be located far from the read-out or recording system or incorporated in it. A recorder is able to store the data, usually electronically, although chart recorders are still widely used for cold stores and containers.

- Air temperature thermometers should be accurate to within ± 2°C and have a resolution of ± 1°C. The response time, i.e. the time taken for readings to stabilize, depends on the construction of the equipment and its use. Also if the system is mobile, it should be able to withstand vibrations, shocks or movement. Normally, accuracy of the electronic component of the recorder is less than ± 0.3°C.
- The sensor can consist of a thermocouple (Type K or Type T), thermistor or platinum resistance device. All of these will give a performance, and cover a temperature range adequate for quick frozen foods.
- Systems are checked and calibrated during manufacture. It is important that once installed, periodic checks are carried out to ensure proper functioning. This is normally undertaken by checking against a calibrated thermometer placed in an equilibrated ice bath.

1.2 AIR TEMPERATURE OF COLD STORES

Sensors should be placed in the chamber in the warmest positions, and the recorders can be placed more conveniently outside the cold store or in control offices.

Sensors should be located high up and well away from the cooler fans and well away from the entry and exit doors, to avoid exaggeratedly low temperatures or wide fluctuations.

Small cold stores (less than 500 m³) may need only one sensor, whereas, those with a volume of less than 30,000 m³ will require two sensors. Stores with a volume from 30,000 m³ to 60,000 m³ will require 4 sensors, and those with a volume above $60,000 \text{ m}^3$ will require 6 sensors.

Retail stores with a volume of less than 10 m³ can be equipped with a visible thermometer only.

1.3 AIR TEMPERATURE MONITORING DURING TRANSPORT

Measurement of the return air temperature to the cooling unit will give a good indication of the load temperature, provided adequate air flow is achieved throughout the length of the vehicle.

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In long vehicles (above 6 m), air ducting is recommended to ensure sufficient cold air reaches the rear of the vehicle. Two sensors are recommended to be fitted in the compartment: one measures the return air temperature, and the other is placed two thirds to three quarters the length of the vehicle mounted in the ceiling ducts. The difference between these two temperatures should be an indication of how well the refrigeration is functioning. If the difference is large or variable it may indicate insufficient pre-cooling, incorrect stowage of pallets, or unnecessary delay in closing the doors.

The recorder can be placed in the vehicle cabin or mounted on the outside usually near the refrigeration controls.

1.4 AIR TEMPERATURE MONITORING IN DISPLAY CABINETS

- Display cabinets should be equipped with an accurate thermometer or temperature measuring device that is easily readable.
- In open cabinets, the temperature should be measured in the return air, at the load line level, or at the warmest place.

2. PRODUCT TEMPERATURE MONITORING

2.1. DIRECT TEMPERATURE MEASUREMENT

2.1.1 Specification of Measuring System

The temperature measuring device used to measure product temperature should be of better accuracy than that used for air temperature monitoring. The following specification is recommended for the system, i.e. sensor and read-out:

- the system should have an accuracy of $\pm 0.5^{\circ}$ C within the measuring range -20° C to $+30^{\circ}$ C;
- the response time should achieve 90% of the difference between initial and final readings within three minutes;
- the display resolution of the read-out should be 0.1°C;
- the measuring accuracy must not change by more than 0.3°C during operation in the ambient range 20°C to +30°C;
- the system should be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards;
- the accuracy of the system should be checked at regular intervals;
- the system should be robust and shock proof; and
- the electrical components of the system should be protected against undesirable effects due to condensation of moisture.

2.1.2 <u>Pre-cooling of the Probe</u>

- The probe should be pre-cooled as close to the product temperature as possible before measurement.
- After inserting the probe, the temperature should be read when it has reached a steady value.

2.1.3 <u>Non-destructive Temperature Measurement</u>

Non-destructive testing is rapid and can be done without unduly disturbing the load. However, because the outside temperature of the pack or carton is being measured this may give rise up to 2°C difference between the true product temperature and the reading obtained. Product surface temperature measurement undertaken non-destructively should:

- measure the temperature between cases on a pallet or between packs inside a carton;
- use sufficient pressure to give good thermal contact, and sufficient length of probe inserted to minimize conductivity errors;
- use a probe with a flat surface to give good surface thermal contact, low thermal mass, and high thermal conductivity.

2.1.4 Destructive Temperature Measurement

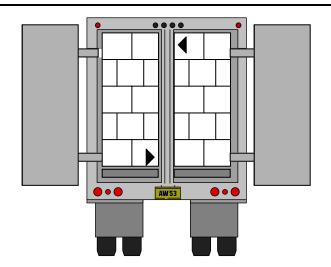
Temperature probes are not designed to penetrate quick frozen foods. Therefore it is necessary to make a hole in the product in which to insert the probe. The hole is made by using a pre-cooled sharp pointed metallic device such as an ice punch, hand drill or an auger. The diameter of the hole should provide a close fit to that of the probe. The depth to which the probe is inserted will depend on the type of product:

- where product dimensions allow, insert the probe to a minimum depth of 2.5 cm from the surface of the product.
- where this is not possible because of the size of the product, the probe should be inserted to a minimum depth from the surface of 3 or 4 times the diameter of the probe.
- where it is not possible or practical to make a hole in certain foods because of their size or composition, e.g. diced vegetables, the internal temperature of the food package should be determined by insertion of a suitable sharp-stemmed probe to the centre of the pack to measure the temperature in contact with the food.
- in order to measure the centre temperature in large products after the quick freezing process it may be necessary to insert the probe to a depth of more than 2.5 cm.

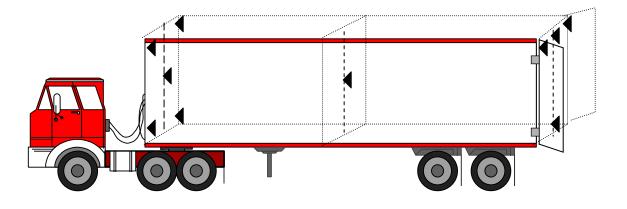
2.2 SAMPLING OF PRODUCTS FOR TEMPERATURE MEASUREMENT

2.2.1 <u>During Transport</u>

- A non-destructive temperature measurement should be taken of the product being loaded into the vehicle and a record entered in the documents.
- A product temperature measurement is required if there appears to be a problem, see Annex 3, Section 4. If it is necessary to measure product temperatures during transport whilst the vehicle is loaded, samples should be selected from the top and bottom of the consignment adjacent to the opening edge of each door or pair of doors.
- Similarly, if product temperature measurement is necessary, when the vehicle is unloaded, and the cargo is placed in refrigerated environments, four samples should be selected from amongst the following points:



Sampling positions for a loaded vehicle



Sampling positions for an unloaded vehicle

- top and bottom of the consignment adjacent to the opening edge of the doors;
- top and far corners of the consignment (as far from the refrigeration unit as possible);
- centre of the consignment;
- centre of the front surface of the consignment (as close to the refrigeration unit as possible);
- top and bottom corners of the front surface of the consignment (as close as possible to the air return inlet).
- When samples are selected a non-destructive temperature measurement should be carried out first. A total tolerance of 2.8°C should be applied (2°C for limitations of methodology and 0.8°C tolerance for the system) before deciding whether a destructive measurement is necessary.

2.2.2 <u>At Retail</u>

• If it is necessary to measure the temperature of quick frozen foods in retail display cabinets, then one sample should be selected from each of three locations representative of the warmest points in the cabinets. The positions will vary with the different types of retail display cabinets used.

3. OPTIONAL AIDS TO TEMPERATURE MONITORING: INDIRECT TEMPERATURE MEASUREMENT

3.1 SIMULATED PRODUCT

When air temperature monitoring is difficult, e.g. during the freezing process it is possible to use a simulated food sample. This is a device that has a similar shape and is made of a material which has similar thermal properties and gives a similar cooling factor to the food being monitored. Materials such as nylon, polystyrene, polyvinyl chloride, perspex and polytetrafluorethylene have similar thermal properties to most foods. Sensors can be embedded permanently into such a device and it can be packed along with the food packages and measured when required. The simulant may also be incorporated into a temperature recording device.

3.2 RECORDERS BETWEEN PACKAGES

Small robust temperature recorders may be placed between packages or in a load, e.g. in cartons, in order to record the temperature over long periods. Such recorders may be programmed and the measurements retrieved by means of a computer.

3.3 NON-CONTACT THERMOMETERS

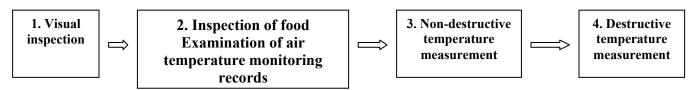
These devices measure the temperature of the food by sensing the infrared radiation emitted by the food. The amount of radiation varies with different materials, which absorb and reflect and transmit radiation differently. Infrared thermometers can be portable and are usually "pistol shaped" sometimes with a laser sighting aid. Target size can be important, since the instrument averages all the radiation in its field of vision. Care must be taken in interpreting results from these devices with quick frozen foods because a package rapidly picks up radiation from its surroundings, there can be a difference between surface temperature and interior temperature. In addition the type of packaging will affect the radiation. Laminated foil packaging in particular can give large errors because it reflects radiation more efficiently than cardboard. There are some newer devices which compensate for this type of error and measure the radiation through a window.

Fixed video camera-type infrared thermometers are also used. These can give thermal images, which permit industrial control of heating or cooling processes to ensure even processing. This is also true of the freezing process. Therefore it is possible to scan large numbers of products and pick out "hot-spots" followed up by more accurate temperature measurements.

3.4 TEMPERATURE INDICATORS (TIS) AND TIME-TEMPERATURE INDICATORS (TTIS)

Many patents have been taken out on mechanisms, which give a colour change, either when a specific temperature has been exceeded (TIs), or when the integrated exposure to a temperature over a period of time has been exceeded. There has been a reluctance to use TIs and TTIs on retail packs for a number of reasons, in particular because they are on the surface of packs not inside the food, and their possible conflict with durability dates. However, TIs and TTIs may be used on the outside of cartons or pallets to detect if temperature abuse has occurred during distribution from cold stores to holding stores at retail, and they can monitor transfer of quick frozen foods where monitoring records may not be available.

4. TEMPERATURE CONTROL - STEPWISE APPROACH



When quick frozen foods are being inspected in the cold chain either before loading or during unloading, a stepwise approach is recommended. When this approach indicates a temperature violation, the procedure in Section 6.2 should be followed.

1. Before loading and during unloading, a visual inspection is recommended in order to verify the condition of the foods.

- 2. In the first instance, the air temperature monitoring records and other temperature readings noted in the documentation following the foods should be examined. If the loading temperature was correct, and the refrigeration system functioning correctly, and there are no irregularities in the temperature difference between the air leaving the refrigeration unit and the air return, then no further action need be taken.
- 3. If there is a doubt about any of the above aspects or no records are available then a non-destructive product temperature measurement could be carried out. This should involve a between carton or between pack temperature reading, see Annex 3, Section 2.1.3. If the non-destructive measurement indicates that the food temperature is inside the legal tolerance the inspection may stop at this point.
- 4. Only if the non-destructive product measurement is outside the tolerance or legal limit should a destructive temperature measurement be undertaken, see Annex 3, Section 2.1.4. This operation must be carried out after placing the cargo in refrigerated environments or after protecting the load in order to avoid reheating the foods. Destructive temperature measurements are time consuming, disruptive to the flow of foods along the chain, and expensive in that the foods tested must be destroyed, or otherwise disposed of.

<u>APPENDIX II</u> IN ORIGINAL LANGUAGE

COMMENTS SUBMITTED IN RESPONSE TO CL 2005/39-CAC

Codex Member comments submitted at Step 3 in response to CL 2005/39-CAC are given below. The comments are presented in original language. They are arranged by countries in alphabetical order.

AUSTRALIA

SPECIFIC COMMENTS

These comments are provided under the four points raised in the Circular Letter plus 'Other Comments'

a) Comments on using the adopted language for the Code of Practice for Fish and Fishery Products regarding DAP and whether this will help alleviate concerns of developing countries

- Section 5 (Hazard Analysis Critical Control Point and Defect Action Point Analysis) of the *Code of Practice* (*COP*) for Fish and Fishery Products was adopted in 2003. It is therefore pertinent that adoption of the language in this document be used in drafting the revision of the *Code of Practice for the Processing and* Handling of Quick Frozen Foods. This ensures consistency of terminology in the safety and quality aspects embodied in the concept of HACCP and DAP in both documents.
- However, Australia suggests that, in order for the revised *COP on Quick Frozen Foods* to be a stand-alone document, more of the language from the *COP for Fish and Fish Products* should be included, particularly with reference to explaining the purpose and application of the DAP Analysis in relation to HACCP.
- While appreciating that DAP analysis deals primarily with quality aspects and is a separate option in the revised COP, Australia sees great merit in integrating the DAP and I-IACCP Sections as has been done in the *COP for Fish and Fishery Products* (e.g. in Figure 5.1 Summary of how to implement a HACCP and Defect Analysis). The proposal to separate safety and quality aspects leads to confusion in interpretation and ignores overlaps. For example, in Annexes 1 and 2 of the *COP for the Processing and Handling of Quick Frozen Food*, DAPs are identified and CCPs not identified in Cold Store, Transport and Retail. While, technically this may be correct, in practical terms there is the possibility of safety breaches if temperature limits are not observed. If these areas are identified only as optional DAPs rather than as part of an integrated safety/quality handling system, problems may arise.

b) Comments addressing whether it is sufficiently clear in the proposed draft code that the *Recommended International Code of Practice: General Principles of Food Hygiene (GPFH)* and its Annex covers concerns regarding safety in the quality provisions

- Australia is unsure what the Working Group is asking by 'safety in the quality provisions'. The GPFH deals specifically with HACCP (safety) principles. However, as pointed out in the Australian response to a) above, it is understood that HACCP and DAP can be part of an integrated system and the wording in the INTRODUCTION to the draft Code makes it clear that HACCP principles may be applied to the determination of a DAP.
- Australia feels the draft is sufficiently clear in conveying that processors and handlers of quick frozen food should consult the GPFH for an overview of the principles to ensure that food is safe and suitable for its intended use. Provisions listed under Section 3 PREREQUISITE PROGRAMME then further elaborate principles specific to quick frozen foods.

c) Further comments on clarification between "safety" and "quality" in the quality provisions, by identifying/separating 'quality provisions' from those sections involving both quality and safety/hygienic aspects: namely Sections 1- objective; 2- Definitions; 3- Prerequisite Programme and 6 Temperature Management in the Cold Chain and its Annex III. Comments on the identified quality provisions if required.

As stated in the Australian response to a) above, there is considerable overlap between the safety and quality provisions but this is not always made clear. Specifically:

• In Section 1 OBJECTIVE, the objectives are stated generally and refer to HACCP but not to identifying/developing quality related Defect Action Points (DAPs). For example, it could include text to reinforce that HACCP may be used to determine safety quality controls.

• In Section 2 SCOPE AND DEFINITIONS it is unclear whether a prerequisite program could be included for quality issues. The definition refers to safety only but Section 3 PREREQUISITE PROGRAMME is also addressing quality.

Specific comments on Section 3:

3.3 FACILITIES

Current text — "In addition to the recommendation of the GPFH, the following provisions shall apply." can be deleted as this is already covered by better wording in Paragraph 3 of the preamble under Section 3 PREREQUISITE PROGRAMME which states 'In addition to the GPFH, the following spec prerequisite provisions shall apply'

3.5 TRAINING

Suggested substitute text — "Staff should have the skills and knowledge appropriate to their work to ensure that safely and quality of foods is not adversely affected during handling. Staff should be aware of the importance of maintaining temperature control for frozen foods to maintain the quality and safety of the foods'. Training programs should be in place (either formal training courses or training provided whilst working) to ensure that staff have these skills and knowledge."

d) Further comments on the quality provisions in Section 5 — Cold Chain Control:

Quality Aspects if necessary.

Section 5 COLD CHAIN: QUALITY ASPECTS

The first paragraph could refer to the application of the I-IACCP approach in deciding quality controls in addition to the reference to a 'systematic approach' as some businesses may feel comfortable using the same principles for both purposes.

Section 5.3 QUICK FREEZING PROCESS

- There is confusion in the wording of the proposed new last sentence in Paragraph 1. The sentence states that raw material should not get in contact with freezers other than the gases stated. In Section 2.2 DEFINITIONS, a freezer is defined as being 'equipment' not a gas. This use of the word 'freezer' needs to be clarified.
- If 'freezer' is supposed to mean 'equipment' then the proposed new sentence fails to take account of the fact that, in many types of freezer, there will be contact between the food being frozen and a moving belt or some other supporting mechanism. This sentence should therefore not be included.

Section 5.4 PACKAGING AND LABELLING

- The second dot point refers to microbial and chemical contamination that could be taken as applying to safety rather than quality. Australia suggests that the words 'that could adversely affect quality' be added for clarity.
- > add a dot point "be suitable for use with frozen food"

Section 5.6 TRANSPORT AND DISTRIBUTION

- Suggest a change in wording to the second sentence of Paragraph 2 as follows "... not to impair the efficiency of the freezing process temperature control, or reduce the refrigeration capacity. The change is suggested as the freezing process would already have taken place prior to Transport and Distribution.
- Suggest a change in wording to the first sentence of Paragraph 6 as follows "Distribution of quick frozen foods to retailers and catering establishments should be carried out..." It is not necessary to specify to whom the frozen foods are distributed.

Section 5.7 RETAIL SALE

> Suggest an addition in wording of the first sentence to

"Quick frozen food should be offered for sale from refrigerated cabinets designed and fit for the purpose.

e) Other Comments

Section 3.1 LOCATION

The second sentence should read as follows

"Processing facilities should be located <u>so</u> as to minimize quality changes..."

Section 6.TEMPERATURE MANAGEMENT IN THE COLD CHAIN

It is unclear how this Section relates to Section 4 (safety) and Section 5 (quality). Australia would prefer that safety and quality be better integrated in the document and comment be made in Section 6 of the pertinence of temperature management to both quality and safety. For example, in Section 6.2 TEMPERATURE VIOLATION, the guidance in the assessment and action needed when a temperature violation occurs is adequate for quality concerns but inadequate for safety concerns in that there is no identification of temperature violations that are a threat to the safety of the food. The guidance relates to food that has risen to above —1 8C but is still frozen. The case could arise where food has become so warm that thawing is evident and the food has reached a temperature warm enough to facilitate the growth of pathogens. The advice to bring the temperature down immediately may mask food that has thawed and in which pathogen growth may have occurred. Therefore, assessment and corrective action needed for temperature violations that are deemed to be a threat to the safety of the food should be included. Annex II provides appropriate Corrective Actions — but in the form of DAPs that are quality related and optional.

Table 1 — 1. Temperature monitoring

- Suggest a change in wording to column 4 (CCP Limit) as follows "Trucks-Product must meet maximum specified temperature"
- Suggest a change in wording to column 5 (Monitoring Procedure) as follows "Incoming truck product temperatures monitored for each received shipment..." In both of these cases, it is important that product temperature (rather than truck temperature) is satisfactory. Ideally it would be useful to also use temperature recording devices in the trucks to verify that the storage temperature, in which the product has been kept from the point of distribution, has been appropriate.

BARBADOS				
Section	Sentence - Paragraph	Type of change	Proposal	Provision
3.5	1 st sentence	Ed.	There is a need to provide clarity in this text.	Food hygiene training is fundamentally important, and staff should also be made aware of the importance of good temperature control and of maintaining quality.
5.1	Paragraph 1	Ed.	Clause needs to be numbered as a sub-clause	5.1.1 Freezing cannot improve quality,optimum quality. Products to be frozensuitability.
5.1	Paragraph 2	Ed.	Clause needs to be numbered as a sub-clause	5.1.2 Products for processingDAP.
5.1.1		Ed.	It is suggested that this clause be changed to 5.1.5 for continuity.	
5.1.2.1	Paragraph 1	Ed.	Clause needs to be numbered	5.1.3
5.1.2.1	Paragraph 2	Ed.	Recommendation to delete sentence. Sentence is redundant (see 5.1.1)	
5.1.2.1	Paragraph 3	Ed.	i) Clause needs to be numbered.ii) Replace "evidently" with "rejected as being"	The amended sentence reads: "5.1.4 Producers should have procedures in place to sort and segregate foods and food ingredients, which are rejected as being unsuitable for further processing."
5.3	Paragraph 1. last sentence	Ed.	Sentence rewritten for clarity, since "freezers" can be mistaken to be appliance/ equipment used to freeze a product.	The sentence is amended as follows: "Only air, nitrogen and carbon dioxide may be used as refrigerant gases for direct contact with the product."
5.5	Sentence 1	Ed.	Replace "colder" with "lower"	The sentence is amended as follows: "Cold stores should be designed and operated so as to maintain a product temperature of -18°C or lower with a minimum of fluctuation, see section 3.2.2."
5.6	Paragraph 4	Ed.	Sentence restructured for clarity.	Recommendation: "A maximum tolerance of +3°C may be permitted during transportation provided that appropriate steps are taken to cool the product to the specified temperature as soon as possible after the temperature increase is detected."

Section	Sentence - Paragraph	Type of change	Proposal	Provision
5.6	Paragraph 5 sentence 1	Ed.	Sentence restructured for clarity.	Sentence amended as follows: "Distribution of quick frozen foods to retailers and catering establishments should be carried out in such a way that product temperature values/ readings higher than -18°C be kept as to a minimum, within the limit set by national legislation, and should not in any case be higher than -12°C in the warmest pack."
5.7	Paragraph 1	Ed	Rewritten for clarity.	Recommendation: "Product temperature values/ readings higher than -18°C should be kept to a minimum, within tolerances established in National legislation, and should not in any case be higher than -12°C in the warmest pack."
6.1	Paragraph 1 sentence 1	Ed.	"Colder" is not a technical term. Replace with "lower"	Amended sentence now reads: "Operators should ensure that appropriate systems which cannot be tampered with are in place to monitor air temperatures during the freezing process and to monitor temperatures along the cold chain in order that quick frozen foods are maintained at -18°C or lower."
6.2	Sentence 2	Ed.	"Warmer" is not a technical term. Replace with " at temperatures higher than that"	Sentence is now amended to read: "Loads or parts of loads that are at temperatures higher than that required for quick frozen food should be identified and sorted immediately."

EUROPEAN COMMUNITY

I. GENERAL COMMENTS

In respect of the specific questions posed in the CL document:

- The language taken from the Code of Practice for Fish and Fishery Products regarding Defect Action Point (DAP) is acceptable and should be helpful.
- The references in the draft Code to the Recommended International Code of Practice: General Principles of Food Hygiene (GPFH) and its Annex are sufficiently clear and adequately cover any concerns regarding safety. There is no need to add further references to safety in the text.
- > The separation of safety and quality issues has improved the document.

II. DETAILED COMMENTS

Introduction

Where the words "essential quality" are used in reference to different Codex Product Standards, this is usually the codex terminology used in that standard (i.e para. 2.2 - definition of "defect" and "temperature abuse"; section 5 - para. 1). Therefore, in these cases, the term "essential" should be retained as it is linking the issue to "essential composition and quality factor" sections which is a standard title in most Cod Product Standards.

However, where the text is not referring to a section in another Codex Standard, the ECMS are of the opinion that the word "essential" may be deleted (i.e in para. 3 of the introduction).

1. Objective

• At the end of the first sentence the following words should be added at the end:

"... and Defect Action Point (DAP) analysis."

In order to take into account this measure which is very important for the quality of the products.

2.2 Definitions

Definition of "cold chain"

The definition is very much narrowed down to quick frozen foods as is stated at the start of 2.2:

"for the purpose of this code only". However, within such a narrow definition the word "slaughter" is not appropriate. Therefore it is suggested to widen the definition and remove the words "quick frozen".

Definition of "cold store"

The same argument applies to cold store. A cold store can be a chiller store or a freezer store or both. It would be preferable to widen the definition rather than limit it to quick frozen foods.

3. Prerequisite Programme

The first sentence should be supplemented as follows:

"Prior to the application of HACCP and the optional use of a DAP analysis to any segment...

3.1 Location

The word "perishable" should be deleted, since finally all raw materials are perishable and it is not clear, how to differentiate between perishable and non perishable raw materials.

3.2.3 Cold Store Design

• In order to take into account the harmlessness of the materials in relation to food, it may be necessary to add " and chemical" after "physical damage".

3.3 Facilities

The ECMS suggest, that under section 3.3 on Facilities, an additional point should be added after "3.3.3 Pest Control Systems", to read:

(new) 3.3.4 Maintenance Regimes

"Proper maintenance and repairs of any damage to the cold store and its infrastructure should ensure that insulation and refri2eration performance is maintained (e.g. prevention of rust, etc.).

3.5 Training

It is suggested to revise the end of the sentence as follows:

"... of good temperature control for guaranteeing food safety and maintaining food quality."

3.6.2 Traceability/Product Tracing

After the first bullet point, the ECMS suggest to expand the bullet point to cover product tracing for products that are unfit for human consumption:

"...that may pose a risk to consumer health or are unfit for human consumption by appropriate...".

5.2 Processing before Freezing

At the first sentence the ECMS propose to add the term "blanching". The word "blanching" should follow the term "slicing".

5.8 Transfer Points

The second sentence of the first bullet point is useful in that it provides advice on minimising the time at ambient temperature during external handling of quick frozen foods. The ECMS suggest that it would be useful to retain this sentence as it is only a recommendation and not a mandatory requirement.

Annex 2

The chart always envisages the same course of operations: packaging, casing, freezing, which does not correspond to the reality of the industry. Freezing in paperboards is increasingly rare; in the most cases, either freezing is carried out on the units of sale to the consumer (freezing by air blowing), or the product is frozen before packaging (freezing on plates, or freezing on fluidised bed or IQF). It is necessary that these practices used by a major part of the industry are envisaged in the chart, i.e.: freezing before conditioning, and freezing after conditioning. This would be translated as indicated below:

	•••	
Packaging	Metal Detection	Freezing
Freezing	К Л	Packaging
Cold Store		Cold Store

Table 2 of Annex 2

The DAP limit for DAPs 11 to 14 should state "Product temperature warmer than —18°C".

This is consistent with the text used in the rest of the Code.

In points 13 and 14 in the third column is stated that the DAP limit is a "product temperature above -18° C". However, the text allows a rise of 3°C during transport (on page 10) or 6°C during distribution to retail establishments (on page 10) within any limits set by national legislation (to note, the latter point is mentioned at 5.7). These permitted deviations should be mentioned in the table.

III. EDITORIAL CHANGES I TRANSLATION ISSUES / TYPING ERRORS

Point 3.1.: "Processing facilities should be located so as..."

Point 4.2.1. in the third line: marinading should be "marinating".

Point 5.4 (French version only): Au 2ème paragraphe, a la 2ème ligne l'expression n 'affecte pas <u>a l' inverse</u> Ia qualité du produit., devrait étre remplacée par . ' n 'affecte pas **de manière défavorable** la qualité du produit.

Point 5.6 (proposed changed linked to a translation issue - from English to French): In paragraph 6: It is noted that in previous versions, only distribution to the retailers was mentioned. While the quick frozen foods are distributed in increasingly large quantities to various caterers, such as restaurants, hospitals, canteens; the phrase "catering establishments" was inserted in the first sentence. However, it remains too restrictive (in particular when translated into the French language). It would be preferable to say: "... to the **retailers and to the end-users, such as** the catering establishments should be carried out...

Point 5.7 (French version only): *Au 3ème paragraphe, ii conviendrait de remplacer radiateurs par source de chaleur*, *ce qui correspond plus a la réalité (par exemple presence d'un four àproximité du meublefrigor*)

Rephrase the headings of Annex 1 and Annex 2: "each step should be analyzed in order to decide <u>if a CCP is</u> <u>necessary</u>"

Table 2 of Annex 2 and Transport and Distribution (point 5.6): the DAP limit for DAPs 11 to 14 should state "Product temperature <u>warmer</u> than -18° C". This is consistent with the text used in the rest of the Code. Similarly, the first sentence of section 5.6 should read:

"temperature of-i 8°C or colder.

Second bullet of point 1.1 of Annex 3: devise should be 'device'.

Fourth bullet of point 2.1.4 of Annex 3: freeing should be "freezing"

Last paragraph of point 4 of Annex 3: should be bullet point 4 (starting with: "Only if the non-destructive product measurement is outside...").

JAPAN

After receiving the revised text in August we examined it together with parties interested in this Code of Practice such as industry. As a result, we have found no problem with the text; therefore, we have no comments on the present Proposed Draft.

MALAYSIA

General Comments

Malaysia would like firstly to congratulate the United States in preparing a revised version of the revision. Here are some of our detailed comments.

The objective of the Code is to provide guidance for Quick Frozen Food Production and Cold Chain Management Systems and the Scope covers processing, handling, storage, reception and distribution and retailing of Quick Frozen Food. However, this guidance should primarily focus on food safety or aspects of quality that are essential and will affect food safety.

Malaysia therefore agrees that this Code includes safety provisions including HACCP (for safety) but does not agree that it makes reference to non-essential quality aspects including Defect Action Points.

INTRODUCTION

Proposed to delete

Para 3

Malaysia proposes the deletion of the third paragraph

Rationale :

The second paragraph adequately addresses the scope and Malaysia does not agree with the inclusion of DAP in the document.

Para 4

Propose to delete the phrase after wholesome products which reads "which can be sold on national or international markets and meet the requirements of Codex Standards".

Rationale :

This code should cover all quick frozen foods so it would not be necessary to have this phrase. Furthermore meeting other requirements should not be a condition or pre-requisite for compliance with this code.

2. SCOPE AND DEFINITION

2.1 Scope

There appears to be a repeat of the scope which had been covered in the 4th Paragraph of the introduction. Hence, Malaysia proposes that reference to the scope in the introduction be deleted or that it should be consistent.

2.2 Definitions

Cold Chain - To replace the phrase "harvesting, slaughter, production" and replace with the word "processing"

Rationale : Maintenance of temperature of quick frozen food is not carried out at the primary stage unless there has been processing.

Cold store - To replace the word "establishment" with "enclosed area" and delete the word "refrigerated"

Rationale

Establishment implies the whole premise which may not always be the case. Also, conditions must be specifically frozen to "preserve quick frozen foods" and not merely refrigerated.

Defect -- To delete this definition

DAP – To delete this definition

Rationale :

This document should focus on food safety and essential quality aspects which affect safety.

Refrigeration system - To insert the word "air" after cold.

3. PREREQUISITE PROGRAMME

Malaysia supports the inclusion and elaboration of the section on pre-requisite program where reference is made to the GPFH.

Paragraph 1, 2nd line – To replace the word "and " with the word "or".

Rationale :

Malaysia is of the opinion that prerequisite programmes can be based on either good hygienic practice or good manufacturing practice.

3.1 LOCATION

2nd sentence – To delete the word "perishable"

4.1 RAW MATERIALS

Last line - To replace the phrase "sections of GPFH" with "Codex documents and guidelines"

Rationale :

Other relevant Codex documents should be used as reference and not just GPFH.

4.2.1 TREATMENT OF PRODUCTS FOR PARASITES

2nd sentence – Editorial error in the word "marinating"

5. COLD CHAIN CONTROL: QUALITY ASPECTS

Malaysia is of the opinion that provisions in this section should primarily address safety issues and quality provisions should be mentioned only if they affect safety.

Para 1

In the first sentence, Malaysia proposes to delete "and labeling provision" and delete the rest of the paragraph which makes reference to DAP's.

Para 2

Malaysia proposes the deletion of this paragraph which refers to DAP's and the example in the annex.

Rationale :

Compliance with labeling is a separate issue and is not part of this code. Essential quality issues which affect food safety are adequately addressed without reference to DAP's.

5.1 RAW MATERIALS

Para 2

In the last sentence Malaysia proposes to replace the word "DAP" with "CCP"

5.2 PROCESSING BEFORE FREEZING

Malaysia proposes to add the following phrase "*with respect to method, product and water temperatures, water quality and quantity, additives etc.*" at the end of the 3rd para in Sec. 5.2. The sentence should read as follows :

"Glazing, to limit dehydration during frozen storage should be addressed with respect to method, product and water temperatures, water quality and quantity, additives etc."

Rationale

A Quick Frozen Food kept in frozen storage for a long period of time is exposed to constant decomposition such as dehydration, rancidity, changes in colour, taste, etc. Glazing applies a thin ice barrier as a protective shell to the product which can counteract the problems mentioned above.

5.5 FROZEN STORAGE

In the last sentence Malaysia proposes to replace the word "DAP" with "CCP".

5.6 TRANSPORT AND DISTRIBUTION

Para 1

Malaysia proposes to delete the last sentence of para 1.

Para 4

There seemed to be contradictary statements in paragraph 4 of Sec. 5.6. with para 6 of Sec. 5.6 and para 1 of Sec. 5.7.

Para 4 of Sec. 5.6. is as follows :

"However, a brief temperature rise of a <u>maximum of 3° C</u> of the product during transport may be tolerated. In this case, if the temperature of any product is warmer than -18° C, the temperature should be cooled to -18° C as soon as possible either during transport or immediately after delivery".

Para 6 of Sec. 5.6. is as follows :

"Distribution of quick frozen foods to retailers and catering establishments should be carried out in such a way that any rise in product temperature warmer than -18° C be kept to a minimum, within the limit set by national legislation, and should not in any case be <u>warmer than -12° C</u> in the warmest pack. After delivery, the product temperature should be cooled to -18° C as soon as possible".

Para 1 of Sec. 5.7. is as follows :

"Quick frozen foods should be offered for sale from refrigerated cabinets designed for the purpose. Cabinets should be capable of maintaining and be so operated as to maintain a product temperature of -18° C. A rise in product temperature may be tolerated for short periods, with any rise warmer than -18° C kept to a minimum, within the limit set by national legislation, with the temperature of the warmest pack <u>not exceeding -12° C</u> and should <u>not in any case be warmer than -12° C</u> in the warmest pack. Temperature in the cabinet may be a DAP."

Malaysia noted that **Para 4 of Sec. 5.6** states that a temperature rise <u>of a maximum of 3°C</u> meaning <u>-15°C is the</u> <u>warmest temperature</u> that can be tolerated by the product. However, **Para 6 of Sec. 5.6 and Para 1 of Sec 5.7** specify that the product temperature should <u>not be warmer than - 12°C</u> meaning that a temperature rise of a <u>maximum of 6°C</u> can be tolerated.

Malaysia agrees with the statement in **Para 4 of Sec. 5.6** that a temperature rise of a maximum of 3°C can be tolerated and that should be reflected in both **Para 6 of Sec. 5.6** and **Para 1 of Sec.5.7** unless a different tolerance is recommended for transportation and display at retail. If so it should be clearly stated.

5.7 RETAIL SALE

Para 1

Malaysia proposes to delete the last sentence of para 1.

TABLE 1. CCPS DESCRIPTION SHEET

Column on Hazard description should be describing hazards associated with the process step. Malaysia proposes that the hazard description should be changed as follows :

CCP Number	Hazard Description
1 Temperature monitoring	"Biological hazard due growth of pathogens due to inappropriate transport and storage temperature of uncooked poultry"
2 Physical inspection	"Physical hazard due to contamination from extraneous material (bone in chicken, foreign material in coating ingredients")
3 Fryer and oven temperatures	<i>"Biological hazards due to survival of pathogens at inadequate Time/Temperature combinations for cooking.</i>
Cooling	"Biological hazards due to growth of pathogens in finished product resulting from inappropriate cooling"

ANNEX 2: ILLUSTRATIVE EXAMPLE ON APPLICATION OF DAPS IN QUICK FROZEN FOOD INDUSTRY

TABLE 2 : DAP DESCRIPTION SHEET

Malaysia proposes to delete Annex 2 and Table 2 as these documents make reference to DAPs.

THAILAND

Thailand appreciates the US Secretariat for the excellent work. We agree that all

provisions concerning or relating to quality should be agreed before the Code will be adopted at Step 5. We, therefore would like to share our comments as follows:

General Comments: Concept and application of DAP

Please refer to our comments at the 28 CAC. We would like to reiterate our previous comments that we do not agree with the concept of Defect Action Point (DAP) which, even though explained in the introduction of this Code, is still difficult to understand. The application of DAP analysis using HACCP guideline is questionable and can lead to arguments. The concept of "Quality", not like "Safety", can be different from country to country and from one trading partner to another. The use of DAP analysis will also be burdensome for the producing countries especially in developing countries. At this moment, we do not support including DAP and DAP analysis in this Code unless there are very clear guideline and criteria on the use of DAP and DAP analysis. In our opinion, the provisions in sections: quality aspects are sufficient for managing all quality aspects of quick frozen foods.

Specific Comments Introduction

We propose to delete the text "in accordance with national legislation" from the last sentence of the last paragraph to be consistent with the definition of "Tolerances".

2.2 Definitions

"Defect Action Points (DAP)"

We propose to add "an essential" before "quality".

4.1 Raw Materials

We propose to delete the word "wholesome" from the I sentence of the 2' paragraph. The safe raw materials are more important as there are processing steps before freezing, e.g. cleaning and sorting, and it may not always be possible to receive only wholesome raw material.

5.2 Processing before Freezing

We request to delete the provision of DAP in section 5, 5.1,5.2, 5.5, 5.6, 5.7 and Annex 2. (See our general comments).

5.3 Quick Freezing Process

We propose to delete the phrase "high humidity and br" from the 2' sentence of the 2 paragraph because high humidity is not critical to quality of frozen foods as compared to warm temperature. It is also difficult for industries to control humidity in processing area especially in the tropical countries.

5.6 Transport and Distribution & 5.7 Retail Sales

The text " temperature rise of a maximum of 3 °C of the product" does not exactly reflect the purpose of the Section. A temperature of -15 °C is a more exact criteria for this purpose. We would like to refer back to the text of the previous version that is "A temperature rise of the product during transport to -15 °C may be tolerated. However, any product with a temperature warmer than -18 °C should be cooled to -18 °C as soon as possible either during transport or immediately after delivery."

5.8 Transfer Points

We propose to delete the words "and humidity" in the dot and "exposure to humidity" in the 2 dot because high humidity causes less effect on quality of frozen foods compared to high temperature, especially when frozen foods are in package/container.

6.1 Temperature Monitoring

The last sentence of the paragraph "National tolerances may apply" could create unjustified barriers to trade. We, therefore, would like to propose deletion of this sentence.

Annex 1: Table I

The presentation of a HACCP plan example should be in compliance with the Codex guideline on HACCP in CAC/RCP-1-1969, Rev.4 (2003), for example control measure of each CCP and verification should be presented. It is also suggested that the examples deal with all 7 principles of HACCP. More information such as hazard analysis, CCP determination should be added to provide better understanding for the users. More examples of HACCP should also be added, if possible, to cover different groups of quick frozen foods, e.g. fishery products, fruits and vegetables.

UNITED STATES OF AMERICA

GENERAL COMMENTS

The United States supports the development and adoption of a **Recommended International Code of Practice for the Processing and Handling of Quick Frozen Foods** as useful guidance for the international trade of frozen foods.

The United States generally supports the Code as drafted, recognizing that the Code will subsequently be transferred to the Codex Committee on Food Hygiene for finalization of the hygiene/safety provision.

SPECIFIC COMMENTS

The United States provides the following responses to the four questions in CL 2005/39-CAC.

Question (a) — Comments on using the adopted language for the *Code of Practice for Fish and Fishery Products* regarding DAP and whether this will help alleviate concerns of developing countries.

The U.S. can accept the inclusion of the DAP concept in the document. We have no comment on whether the inclusion of the DAP concept will help alleviate concerns of developing countries.

Question (b) — Comments addressing whether it is sufficiently clear in the proposed draft code that the *Recommended International Code of Practice: General Principles of Food Hygiene* and its Annex covers concerns regarding safety in the quality provisions.

The United States suggests that the draft Code reference the *Recommended International Code of Practice* — *General Principles of Food Hygiene*. Specifically we suggest that, as is standard practice with respect to commodity specific Codex codes of hygienic practice and codes of practice, the Code indicate that the provisions of the *General Principles of Food Hygiene* should be followed and that the hygiene provisions in the Code are in addition to those present in *General Principles of Food Hygiene*. In this regard we suggest the following paragraph on the use of the document can be added either at the end of the Introduction section.

The provisions of this document are supplemental to and must be used in conjunction with, the *Recommended International Code of Practice-General Principles of Food Hygiene, CAC/RCP 1- 1969, Rev. 4, 2003.*

The review by CCFH will need to ensure that the provisions of this paragraph are met in the

Code; that is, that the hygiene/food safety provisions are, in fact, supplemental to the General

Principles of Food Hygiene.

Question (c) — Further comments on clarification between "safety" and "quality" in the quality provisions, by identifying/separating "quality provisions" from those sections involving both quality and safety/hygienic aspects namely: Sections 1 — Objective; 2 — Definitions; 3 — Prerequisite Program; and 6 — Temperature Management in the Cold Chain and its Annex III. Comments on the identified quality provisions if required.

- The U.S. has identified Sections 3.1 (Location) and 3.2 (Facility Design and Construction) as sections that address quality issues. Comments are as follows:
 - Section 3.2.1/Sentence 3 states: "Many raw materials and food products are highly perishable and should be handled carefully to maintain their quality until the freezing process is initiated." The U.S. believes that this sentence is not relevant to Section 3.2.1 (Process Plant Design) and suggests that it be moved to Section 5 (Cold Chain Control: Quality Aspects).
- The U.S. has identified Sections 6.1 (Temperature Monitoring) and 6.2 (Temperature Violations) as sections that address both quality and safety issues. Both sections include reference to Annex 3 (Temperature Monitoring and Control in the Cold Chain). The U.S. believes that certain sections contained in Annex 3 (e.g., Sections 1.2, 1.3, 1.4, 2.2.1 and 2.2.2) may be appropriate for inclusion in Section 6. The United States recommends that CCFH, in its review of food safety provisions, determine changes that should be made to the text to better separate quality from safety issues.

Question (d) — Further comments on the quality provisions in Section 5 — Cold Chain Control:

Quality Aspects if necessary.

Section 5.1/Sentence 3 states: "Products for processing and quick freezing must be prepared without delay and temperature control should be applied in order to minimize possible chemical or biochemical changes." The U.S. questions whether all products require immediate preparation and suggests that this sentence be revised as follows: "Products for processing and quick freezing must be prepared without delay, if required, and appropriate temperature control should be applied in order to minimize chemical or biochemical changes that might affect quality."

- Section 5.1.2.1/The U.S. suggests combining sentence 2 and 3 as follows: "Producers should have appropriate procedures in place for sorting and segregating raw materials which are unsuitable for further processing."
- Section 5.2/The last sentence states: "If frozen intermediate materials are used in processing, temperature control and monitoring should be applied as appropriate." The U.S. believes that this sentence is unnecessary because the issue is addressed in the previous paragraph.
- Section 5.6/Sentence 6 states: "However, a brief temperature rise of a maximum of 3°C of the product during transport may be tolerated." The U.S. believes that the use of the word "however" is unclear and suggests revising the sentence as follows: "A brief temperature rise of a maximum of 3°C of the product during transport may be tolerated." In addition, sentence 8 specifies distribution of quick frozen foods to "retailers and catering establishments." The U.S. suggests that these recommendations not be limited to retailers and catering establishments and suggests revising the statement as follows: "Distribution of quick frozen foods should be carried out in such a way that any rise in product temperature warmer than 18°C be kept to a minimum, within the limit set by national legislation, and should not in any case be warmer than -12°C in the warmest pack."
- Section 5.8/The U.S. suggests combining bullets 1, 2, and 3 as follows: "Procedures should be established for the transfer and storage of quick frozen foods to minimize exposure to conditions that might adversely affect product quality (e.g., elevated temperature/humidity)

VENEZUELA		
LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
Section: INTRODUCTION Paragraph 2 (last line)	Health and Safety	Quality and Safety
Paragraph 3	Since the Code is intended to cover not only those hazards associated with safety but to include other aspects of production including the essential product quality, composition and labeling provisions as described in product standards developed by the Codex Alimentarius Commission, not only are critical control points (CCP) described but also defect action points (DAP) are included in the Code. The HACCP principles may be applied to the determination of a DAP, with quality instead of safety parameters being considered at the various steps. However, DAP analysis is optional and other techniques which achieve the same objective may be considered.	Since the Code is intended to cover not only those hazards associated with safety but to include other aspects of production including the essential <u>product</u> quality, composition and labeling provisions as described in product standards developed by the Codex Alimentarius Commission, not only are <u>critical control points (CCP)</u> described but also <u>control points (CP)</u> are included in the Code, <u>The HACCP principles may be applied to the</u> determination of a DAP, with quality instead of <u>safety</u> parameters being considered at the various steps. However, DAP analysis is optional and other techniques which achieve the same objective may be considered NOTE: IN THE REST OF THE DOCUMENT, CHANGE DEFECT ACTION POINTS (DAP) TO CONTROL POINTS (CP) IN ORDER TO REFER TO QUALITY NOT SAFETY PARAMETERS AND TO HAVE COHERENCE WITH THE GPFH AND GUIDELINES FOR APPLYING HACCP
Paragraph 4	The aim of this Code is to provide background information and guidance for the elaboration of quick frozen food production and cold chain management systems that incorporate Good Manufacturing Practices (GMPs) as well as the application of HACCP. In addition, the Code may be used for training of employees of the quick frozen food industry. The national application of this Code requires modifications and amendments, taking into account local conditions and specific consumer requirements.	This Code will assist all those who are engaged in the <u>handling</u> and processing of quick frozen foods or are concerned with their storage, transportation, retailing , export, import and sale in attaining <u>safe</u> , <u>quality</u> products which can be sold on national or international markets and meet the requirements of the Codex Standards. NOTE: MAINTAIN THE USAGE OF THE TERMS QUALITY AND SAFETY IN THE REST OF THE TEXT, IN AGREEMENT WITH CODEX GPFH

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
Section 1. OBJECTIVE	The aim of this Code is to provide background information and guidance in those countries where they have not yet been developed, for the elaboration of quick frozen food production and cold chain management systems that incorporate Good Manufacturing Practices (GMPs) as well as the application of HACCP. In addition, the Code may be used for training of employees of the quick frozen food industry. The national application of this Code requires modifications and amendments, taking into account local conditions and specific consumer requirements.	The aim of this Code is to provide background information and guidance in those countries where they have not yet been developed, for the elaboration implementation of quick frozen food (QFF) production and cold chain management systems that incorporate Good Manufacturing Practices (GMPs) [addition in the version in Spanish: "buenas prácticas de fabricación <u>o de manufactura</u> (<u>BPF/BPM</u>)] and the rest of the prerequisites required for the application of HACCP. In addition, the Code may be used for training of employees of the quick frozen food industry <u>enterprise</u> . The national application of this Code requires modifications and amendments, taking into account local conditions and specific consumer requirements.
Section 2.2 DEFINITIONS	Blanching : A technical treatment sufficient to inactivate certain enzymes.	Scalding or Blanching: A heat treatment sufficient to inactivate certain enzymes
	Cold Chain : A term embracing the continuity of successively employed means to maintain the temperature of quick frozen foods from <u>harvesting</u> , <u>laughter</u> , production to retailing.	Cold Chain : A term embracing the continuity of successively employed means to maintain the temperature of quick frozen foods from <u>harvesting</u> , <u>slaughter</u> , production to <u>sale retailing</u> . (include wholesaling and retailing)
	Defect Action Point (DAP) : A step at which control can be applied and a quality (non-safety) defect can be prevented, eliminated or reduced to an acceptable level, or the risk of mislabeling can be eliminated.	Defect Action Point (DAP): A step at which control can be applied and a quality (non-safety) defect can be prevented, eliminated or reduced to an acceptable level, or the risk of mislabeling can be eliminated. (See Annexed Note) NOTE: CHANGE DAP TO CONTROL POINTS (CP) IN ORDER TO HAVE COHERENCE WITH THE GPFH.
	Prerequisite Program: Program required prior to the application of the HACCP system to ensure that any component of the cold chain is operating according to the Codex <i>Recommended International Code of Practice: General Principles of Food Hygiene</i> , the appropriate Code of Practice and appropriate food safety legislation.	Prerequisite Program: Program required prior to the application of the HACCP system to ensure that any component of the cold chain is operating according to the Codex <i>Recommended International Code of Practice: General Principles of Food Hygiene</i> , the appropriate <u>Codex</u> Code of Practice and appropriate food <u>quality and</u> safety legislation-standards.

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	Quick Frozen Food : Food which has been subjected to a quick freezing process, and maintained at -18° C or lower in the cold chain, subject to permitted temperature tolerances, and labeled as such.	Quick Frozen Food : Food which has been subjected to a quick freezing process, and maintained at -18° C or lower in the cold chain, subject to permitted temperature tolerances, and labeled as such. [Translator's note: change in grammar in the Spanish version only]
	Raw Material : Fresh or processed food which may be utilized to produce quick frozen food products intended for human consumption.	Raw Material : Fresh or processed food that <u>is used</u> to produce quick frozen food products intended for human consumption.
	Refrigeration system (unit, plant) : Equipment which supplies a source of cold to reduce the temperature of food or maintain food at frozen temperature.	Refrigeration system (unit, plant) : Equipment which supplies a source of cold to reduce the temperature of food or maintain food at frozen temperature. [Translator's note: change in Spanish word for Refrigeration, from "Refrigeración" to "Enfriamiento"]
	Temperature Abuse : Warming of quick frozen food to a temperature outside any permitted tolerance, so that it may adversely affect essential quality or safety of the food.	Temperature Abuse : Warming of quick frozen food to a temperature outside any permitted tolerance, so that it may adversely affect essential quality or safety of the food.
	Temperature monitoring : The act of conducting a planned sequence of observations or measurements of the temperature of the refrigerated systems and/or quick frozen foods in order to verify that the temperature is kept within the established tolerances.	Temperature monitoring : The act of conducting a planned sequence of observations or measurements of the temperature of the refrigerated systems and/or quick frozen foods in order to verify that the temperature is kept within the established tolerances. [Translator's note: change in Spanish word for refrigeration, from "refrigeración" to "enfriamiento"]
	Temperature Indicator (TI) : A device that indicates the heat history over time, as of the moment of its initial activation.	Temperature Indicator (TI) : A device which on activation exploits a physical or physico-chemical reaction to produce an observable and irreversible change once a predetermined threshold temperature has been reached.
	Tolerances : Short term fluctuations of temperature that the product in the cold chain undergoes, within limits permitted in the Code of Practice and which do not affect food safety and quality.	Tolerances : Short term fluctuations of temperature of that the product in the cold chain undergoes, within limits permitted in the Code of Practice and which do not affect food safety and quality.
	Transfer Point : Point at which the food is transferred between two points in the cold chain, while its temperature is maintained at regulation levels.	Transfer Point : Point at which the food is transferred between two points stages in the cold chain, while its temperature is maintained at regulation levels

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	PREREQUISITE PROGRAM	PREREQUISITE PROGRAM
Section 3. PREREQUISITE PROGRAM	Prior to the application of HACCP to any segment of the quick frozen food chain, that segment should be supported by prerequisite programs based on good hygienic practice (and good manufacturing practice). Prerequisite programs should be specific within an individual establishment, and should require monitoring and evaluation to ensure their continued effectiveness.	Prior to the application of HACCP to any segment of the quick frozen food chain, that segment should be supported by prerequisite programs based on Good Agricultural Practices (GAP), Good Veterinary Practices (GVP), <u>Good</u> <u>Hygiene Practices in Preparation and Service (GHP), Good</u> <u>Manufacturing Practices (GMP)</u> , and <u>Operative</u> Sanitation Programs (OSP), among others. Prerequisite programs should be specific within an individual establishment, and should require monitoring and evaluation to ensure their continued effectiveness.
Section 3.1 LOCATION	Processing facilities should be located as to minimize quality changes of perishable raw materials for quick frozen foods prior to freezing.	Processing facilities should be located as to minimize quality <u>and safety</u> changes of perishable raw materials for quick frozen foods prior to freezing.
Section 3.2.1 PROCESS PLANT DESIGN	The food processing facility should be designed for the rapid processing, freezing and storage of food products. The processing facility should include a product flow that is designed to minimize process delays that could result in reduction in food quality. Many raw materials and food products are highly perishable and should be handled carefully to maintain their quality until the freezing process is initiated.	The food processing facility should be designed for the rapid processing, freezing and storage of food products. The processing facility should include a product flow that is designed to minimize process delays that could result in reduction affect the food quality and safety. Many raw materials and food products are highly perishable and should be handled carefully to maintain their safety and quality until the freezing process is initiated.
Section 3.2.2 COLD STORE DESIGN	 adequate refrigerating capacity provides and maintains a product temperature of -18°C or colder; 	 adequate refrigerating capacity provides and maintains a product temperature of -18°C or colder; [Translator's note: change in Spanish word for refrigeration, from "refrigeración" to "enfriamiento"]
Section 3.2.3 EQUIPMENT DESIGN AND CONSTRUCTION	The equipment should be designed and constructed in such a manner that physical damage to the raw materials and product is minimized, e.g. by ensuring there are no sharp inside corners or projections. Freezers should be designed and constructed so that, when properly operated, they meet the requirements of a quick freezing process.	The equipment should be designed and constructed <u>with</u> <u>non-toxic materials</u> in such a manner that physical damage to the raw materials and product is minimized, e.g. by ensuring there are no sharp inside corners or projections. Freezers Equipment should be designed and constructed so that, when properly operated, they meet the requirements of a quick freezing process.

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	TRAINING	TRAINING AND EDUCATION
Section 3.5 TRAINING	Food hygiene training is fundamentally important, and staff should also be aware about the importance of good temperature control and maintaining quality.	Food hygiene training <u>and</u> education is fundamentally important, <u>placing emphasis on the</u> importance of good temperature control and maintaining quality.
Section 3.6.1 RECALL PROCEDURES	Effective documented procedures should be in place to enable rapid recall of any lot of quick frozen foods from the retail establishment.	Effective documented procedures should be in place to enable rapid recall of any lot of quick frozen foods from the establishments (warehouses, distributors and points of sale).
	Traceability/Product Tracing is essential to an effective recall procedure and is a necessary component of a prerequisite program because no process is fail-safe.	Traceability/Product Tracing is essential to an effective recall procedure <u>for quick-frozen foods</u> and is a necessary component of a prerequisite program because no process is fail-safe
Section 3.6.2 TRACEABILITY/ PRODUCT TRACING	 enable withdrawal of products that may pose a risk to consumer health by appropriate recall procedures; facilitate the identification of the producing/manufacturing history (one step forward, one step back) of the product to identify the source of the problem and apply corrective measures. 	 enable withdrawal of products that may pose a risk to consumer health by appropriate recall procedures; facilitate the identification of the producing/manufacturing history (one step forward, one step back) of the product to identify the source of the problem and apply corrective measures.
Section 4. COLD CHAIN CONTROL: SAFETY ASPECTS	Each operation in the cold chain, where appropriate, should develop its own HACCP plan. This plan should be developed in accordance with the recommendations of the Annex to the GPFH.	Each operation in the cold chain, where appropriate, should develop its own HACCP plan. This plan should be developed in accordance with the recommendations of the Annex to the GPFH. [Translator's note: change in Spanish grammar only – no change to the English version] NOTE: WE PROPOSE COMBINING SECTIONS 4 AND 5, DUE TO THE CLOSE LINK BETWEEN SAFETY AND QUALITY. IN THIS MANNER, IN THE PRESENT CORRECTED TEXT, SOME ASPECTS WOULD BE CCP AND OTHERS CP

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
Section 4.1 RAW MATERIALS	Freezing should not be considered as a lethal treatment for microbiological contamination in foods. However, freezing may result in the death of certain microorganisms and will inhibit the growth of others. The raw materials used should be safe and wholesome. Receiving is often considered as a CCP. For highly perishable products, such as in the example in Annex 1, temperature control at reception may also be considered as a CCP.	Freezing should not be considered as a lethal treatment for microbiological contamination in foods. However, freezing may result in the death of certain microorganisms and will <u>inhibit</u> the growth of others. <u>However, toxins, for example,</u> <u>are not eliminated by this process.</u> The raw materials used should be safe and <u>ideal for the</u> <u>intended use</u> . Receiving is often considered as a CCP. For highly perishable products, such as in the example in Annex 1, <u>temperature control at reception may also be</u> <u>considered as a CCP</u> . <u>NOTE: QUALITY AND SAFETY ASPECTS HAVE</u> <u>BEEN COMBINED, AS WAS PREVIOUSLY</u> <u>PROPOSED</u>
	Processing before Freezing	<u>Treatments before</u> Freezing
Section 4.2 PROCESSING BEFORE FREEZING	Raw materials may be processed in many ways before freezing, e.g. cleaning, sorting, cutting, slicing, conditioning, aging, filleting, and heating. Whether or not such processes should be regarded as CCPs depends on the actual conditions, especially on how much time the food spends in the critical temperature zone, i.e. between 10°C and 60°C.	Raw materials may be processed in many ways before freezing, e.g. cleaning, sorting, cutting, slicing, conditioning, aging, filleting, and heating. Whether or not such processes should be regarded as CCPs or CPs depends on the actual conditions, especially on how much time the food spends in the critical temperature zone, i.e. between 10°C and 60°C.
	If storage of foodstuffs (raw material or intermediates) prior to further processing is necessary, the storage conditions, especially temperature, should be appropriate to the foodstuff concerned.	If storage of raw material prior to further processing is necessary, the storage conditions, especially temperature, should be appropriate to the same.
	The heat treatment of many pre-cooked foods, e.g. prepared meals, should be sufficient to ensure inactivation of pathogens of most concern. In such cases, the time-temperature treatment and subsequent cooling may be considered as CCPs, see Annex 1.	The heat treatment of many pre-cooked foods, e.g. prepared meals, should be sufficient to ensure inactivation of pathogens of most concern. In such cases, the time- temperature treatment and subsequent cooling may be considered as CCPs, see Annex 1. [Translator's note: change in Spanish grammar only – no change to the English version]

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	If frozen raw materials are used and a thawing process is included, the thawing method should be clearly defined, and the thawing schedule (time and temperature parameters) should be carefully monitored. Selection of the thawing method should take into account the thickness and uniformity of size of the products in particular. Thawing time/temperature and food temperature critical limits should be selected so as to control the development of microorganisms. Thawing time and temperature parameters may be a CCP.	If frozen raw materials are used and a thawing process is included, the thawing method should be clearly defined, and the thawing schedule (time and temperature parameters) should be carefully monitored. Selection of the thawing method should take into account the thickness, <u>the</u> <u>texture</u> , and uniformity of size of the products in particular. Thawing time/temperature and food temperature critical limits should be selected so as to control the development of microorganisms. Thawing time and temperature parameters may be are a CCP.
Section 4.2.1 TREATMENT OF PRODUCTS FOR PARASITES	In products intended for raw consumption or not fully cooked prior to consumption, freezing can be used to control hazards in fish from live helminth (nematode, trematode, cestode) worm parasites, such as anasakine nematodes and trichinae in pork. Freezing may serve as a control mechanism when developing HACCP plans for marinating, pickling, or other final preparations which do not supply sufficient heat from cooking to inactivate any potentially harmful parasites. The conditions required for effective parasite control using freezing include the final temperature and time of holding in the frozen state. These parameters vary depending on a number of factors which may include the host species, species of parasite, thickness of the product, and arrangement of product in the freezer.	In products intended for raw consumption or not fully cooked prior to consumption, freezing can be used to control hazards in fish from live helminth worm (nematode, trematode, cestode) parasites, such as anasakine nematodes and trichinae in pork. Freezing may serve as a control mechanism when developing <u>HACCP</u> plans for marinating, pickling, or other final preparations which do not supply sufficient heat from cooking to inactivate any potentially harmful parasites. The conditions required for effective parasite control using freezing include the final temperature and time of holding in the frozen state. These parameters vary depending on a number of factors which may include the host species, species of parasite, thickness of the product, and arrangement of product in the freezer.
Section 5 COLD CHAIN CONTROL: QUALITY ASPECTS (NOTE: WHAT WAS MENTIONED IN SECTION 4 APPLIES HERE)	The Code is intended to cover not only safety aspects of quick frozen foods but also other aspects of production including the essential product quality and labeling provisions as described in product standards developed by the Codex Alimentarius Commission. Therefore, Defect Action Points (DAPs) are included in the Code. In the determination of DAPs, quality parameters are considered at the various steps by applying a systematic approach.	The Code is intended to cover not only safety aspects of quick frozen foods but also other aspects of production including the essential product quality and labeling provisions as described in product standards developed by the Codex Alimentarius Commission. Therefore, Defect Action Control Points (DAPs -CPs) are <u>also</u> included in the Code. In the determination of CPs DAPs , quality parameters are considered at the various steps by applying a systematic approach. NOTE: MOVE THIS PARAGRAPH TO THE FIRST PARAGRAPH OF SECTION 4 (COMBINE SAFETY AND QUALITY)

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	An illustrative example on the use of DAPs in production and distribution of a quick frozen product, i.e. quick frozen chicken nuggets, is given in Annex 2. The approach for DAP analysis is optional and other techniques, which achieve the same objective, may be considered.	An illustrative example of CPs on the use of DAPs in production and distribution of a quick frozen product, i.e. quick frozen chicken nuggets, is given in Annex 2. The approach for DAP analysis is optional and other techniques, which achieve the same objective, may be considered.
Section 5.1 RAW	Freezing cannot improve quality, and it is necessary to use sound and wholesome raw materials at the optimum level of freshness and maturity. Products to be frozen should be selected according to their freezing suitability. Possible chemical or biochemical changes should be minimized by appropriate temperature control. Products intended for processing or quick freezing should be prepared without delay, and temperature controls should be applied in order to minimize chemical or biochemical changes.	Freezing cannot improve quality, and it is necessary to use sound and wholesome raw materials at the optimum level of freshness and maturity. Products to be frozen should be selected according to their freezing suitability. Products intended for processing or quick freezing should be prepared without delay, and temperature controls should be applied in order to minimize chemical or biochemical changes.
MATERIALS	If frozen raw materials are used and a thawing process is included, the thawing method should be clearly defined, and the thawing schedule (time and temperature parameters) should be carefully monitored. Selection of the thawing method should take into account the thickness and uniformity of size of the products in particular. Thawing time and temperature parameters may be a DAP.	If frozen raw materials are used and a thawing process is included, the thawing method should be clearly defined, and the thawing schedule (time and temperature parameters) should be carefully monitored. Selection of the thawing method should take into account the thickness, <u>texture</u> , and uniformity of size of the products in particular. Thawing time and temperature parameters may be a DAP CP. NOTE: THIS PARAGRAPH COULD BE INSERTED INTO SECTION 4, NUMBER 4.1
Section 5.1.1 MICROBIOLOGICAL ASPECTS	Initial microbial numbers in products to be frozen should be kept as low as possible as this helps to obtain an appropriate storage life, by reducing problems with, for instance, off-taste, undesirable flavors or colors during frozen storage.	Initial microbial load numbers in products to be frozen should be kept as low as possible as this helps to obtain an appropriate storage life, by reducing quality problems with, for instance, <u>related to</u> off-taste, undesirable flavors or colors during frozen storage. NOTE: THIS PARAGRAPH COULD BE INSERTED INTO SECTION 4, NUMBER 4.1

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
Section 5.1.2.1 OTHER RAW MATERIALS QUALITY ASPECTS	To minimize deterioration,	To minimize deterioration, NOTE: MOVE TO SECTION 4.1
Section 5.2 PROCESSING BEFORE FREEZING	PROCESSING BEFORE FREEZING	PROCESSING BEFORE FREEZING NOTE: REVIEW FOR TRANSFER TO SECTION 4.2
	Raw materials may be processed in many ways before freezing, e.g. cleaning, sorting, cutting, slicing, conditioning, ageing, filleting, and heating. Consideration should be given with regard to any of these processes whether or not they should be regarded as DAPs.	Raw materials may be processed in many ways before freezing, e.g. cleaning, sorting, cutting, slicing, conditioning, ageing, filleting, and heating. Consideration should be given with regard to any of these processes whether or not they should be regarded as <u>PCCs or PCs</u> DAPs .
	Blanching is often used in the production of frozen vegetables and other products to inactivate enzymes that would cause quality problems (taste, color) during frozen storage. The blanching schedule should be determined to ensure the desired quality outcome, and may be a DAP. Glace should be considered in order to limit dehydration during frozen storage at a temperature lower than -18°C.	Scalding is often used in the production of frozen vegetables and other products to inactivate enzymes that would cause quality problems (taste, color) during frozen storage. Scalding should be ensure the desired quality outcome, and may be a CP. Glace should be considered in order to limit dehydration during frozen storage.
	If storage of intermediate ingredients prior to further processing is necessary, the storage conditions, especially temperature, should be appropriate to the foodstuff concerned <u>and its later processing or future use</u> , <u>as applicable</u> , should be considered.	If storage of intermediate ingredients prior to further processing is necessary, the storage conditions, especially temperature, should be appropriate to the foodstuff concerned <u>and its later</u> processing or future use, as applicable, should be considered.
Section 5.3 QUICK FREEZING PROCESS	If frozen intermediate materials are used in processing, temperature control and monitoring should be applied.	If frozen raw materials are used in processing, the temperature should be controlled.

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	 In general, the packaging should: protect the sensory and other quality characteristics of the food; protect the product against dehydration; protect the food against microbial and other 	 In general, the packaging should: protect the product against dehydration; protect the food against microbial and other contamination protect the sensory, <u>functional</u>, and other quality
	 contamination; and not add to the food any substance which may influence the quality of the food. 	 characteristics of the food; and not add to the food any substance which may influence the quality <u>and safety</u> of the food.
Section 5.4 PACKAGING AND LABELING	The packaging or re-packing of quick frozen foods should be carried out in such a manner that an increase in temperature <u>within authorized tolerances</u> of the quick frozen foods does not <u>adversely</u> affect the quality of the product.	The packaging or re-packing of quick frozen foods should be carried out in such a manner that an increase in temperature within authorized tolerances of the quick frozen foods does not adversely affect the quality <u>or safety</u> of the product.
	Packed quick frozen foods should comply with the requirements of the Codex General Standard for the Labeling of Prepackaged Food (CODEX STAN 1-1985, Rev. 1-1991).	Packed quick frozen foods should comply with the requirements of the Codex General Standard for the Labeling of Prepackaged Food (CODEX STAN 1-1985, Rev. 1-1991).
	Cold stores should be designed and operated so as to maintain a product temperature of -18°C or lower with a minimum of fluctuation, see section 3.2.2. The temperature of the cold store may be a DAP.	Cold stores should be designed and operated so as to maintain a product temperature of -18°C or lower with a minimum of fluctuation, see section 3.2.2. The temperature of the cold store may be a CCP.
	Stocks should be rotated to ensure that the products leave the cold store on a "First in-First out" basis (FIFO).	Stocks should be rotated to ensure that the products leave the cold store on a "First in-First out" basis (FIFO).
Section 5.6 TRANPORT AND DISTRIBUTION	The transport of quick frozen foods should be carried out in suitably insulated equipment, which maintains a product temperature of -18°C or lower. The product temperature during transport and distribution may be a DAP.	The transport of quick frozen foods should be carried out in suitably insulated equipment, which maintains a product temperature of -18°C or lower. The product temperature during transport and distribution may be a CP.
DISTRIBUTION	Vehicle compartments or containers should be pre- cooled prior to loading. Care should be taken not to impair the efficiency, or reduce the refrigeration capacity.	Vehicle compartments or containers should be pre-cooled prior to loading. Care should be taken not to reduce the effectiveness of the process or the refrigeration capacity.

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	The user of the vehicle or container should ensure:	The user of the vehicle or container should ensure:
	 effective functioning of the refrigeration unit during transit, including thermostat regulation; effective tight stowage of the load in the vehicle 	• effective functioning of the refrigeration unit during transit, including thermostat regulation <u>and</u> <u>temperature reading;</u>
	or the container to protect the cargo against heat entering from outside;	• <u>effective tight stowage of the load in the vehicle or</u> <u>the container, avoiding contact of the cargo with</u>
	• efficient operation of the refrigerating unit during transit, including the correct thermostat setting;	 <u>the walls;</u> efficient operation of the refrigerating unit during transit, including the correct thermostat setting;
	• an appropriate method of unloading at the points of arrival (particularly the frequency and duration of door openings);	 an appropriate method of unloading at the points of arrival (particularly the frequency and duration of door openings);
	• appropriate maintenance of the isothermal box and <u>refrigeration</u> system	 appropriate maintenance of the isothermal box and <u>refrigeration</u> system
	• appropriate cleaning of the vehicle or container.	• appropriate cleaning of the vehicle or container
	Quick frozen foods should be offered for sale from refrigerated cabinets designed for the purpose. Cabinets should be capable of maintaining and be so operated as to maintain a product temperature of -18°C. A rise in product temperature may be tolerated for short periods but the product temperature on the warmest pack should not be allowed to become higher than -12°C. Temperature in the cabinet may be a DAP.	Quick frozen foods should be offered for sale from refrigerated cabinets designed for the purpose. Cabinets should be capable of maintaining and be so operated as to maintain a product temperature of -18°C. A rise in product temperature may be tolerated for short periods but the product temperature on the warmest pack should not be allowed to become higher than -12°C. Temperature in the cabinet may be a <u>CP or CCP</u> .
Section 5.7 RETAIL SALE	Display cabinets should be equipped with an <u>appropriate</u> temperature measuring device, see Annex 3, section 1.4.	Display cabinets should be equipped with an appropriate temperature measuring device, see Annex 3, section 1.4.
	Cabinets are located so that the open display area is not subject to draughts or abnormal radiant heat (e.g. direct sunlight, strong artificial light or in direct line with heaters).	<u>Refrigerated</u> display cabinets should be located so that the open display area is not subject to draughts or abnormal radiant heat (e.g. direct sunlight, strong artificial light or in direct line with heaters).
	Defrost cycles should be programmed in such a way that, as far as possible, defrosting takes place outside peak shopping periods.	Defrost cycles <u>for equipment</u> should be programmed in such a way that, as far as possible, defrosting takes place outside peak shopping periods.

LOCATION OF TEXT	WHERE IT SAYS	IT SHOULD SAY
	The content of the cabinet should never be stocked outside the load line.	The content of the <u>display</u> cabinet should never be stocked outside the load line.
Section 5.8 TRANSFER POINTS	Stocks should be rotated to ensure that the products	(NO COMMENTS)
Section 6. TEMPERATURE MANAGEMENT IN THE COLD CHAIN	TEMPERATURE MANAGEMENT IN THE COLD CHAIN	TEMPERATURE <u>MONITORING</u> IN THE COLD CHAIN
	TEMPERATURE MONITORING	TEMPERATURE MONITORING
Section 6.1 TEMPERATURE MONITORING	Operators should ensure that appropriate systems <u>that</u> <u>cannot be improperly altered</u> are in place to monitor air temperatures during the freezing process and to monitor temperature along the cold chain in order that quick frozen foods are maintained at -18°C or colder. National tolerances may apply.	Operators should ensure that appropriate systems are in place to monitor air temperatures during the freezing process and to monitor temperature along the cold chain in order that quick frozen foods are maintained at -18°C or colder. National tolerances may apply.
Section 6.2 TEMPERATURE	Loads or parts of loads that are warmer than the temperature required for quick frozen food should be identified and sorted immediately. Delivery, removal and sale of these loads or parts of loads should be suspended. It is the responsibility of the person in possession of the food to ensure that its temperature is brought down immediately, and, more generally, to take any necessary measures for preserving the food.	Loads or parts of loads that are warmer than the temperature required for quick frozen food should be identified and sorted immediately. Delivery, removal and sale of these loads or parts of loads should be suspended. It is the responsibility of the person in possession of the food to ensure that its temperature is brought down immediately, and, more generally, to take any necessary measures for preserving the food.
VIOLATION	In such cases, the supplier should be informed immediately by the person in possession of the food that an incident may have occurred. The buyer, if his or her identity is known, should be informed that an incident may have occurred. Even if not responsible for loading the goods, legally the buyer is the receiver of the goods and must therefore be notified of any incident affecting him or her.	In such cases, the supplier should be informed immediately by the person in possession of the food that an incident may have occurred. The buyer, if his or her identity is known, should be informed that an incident may have occurred. Even if not responsible for loading the goods, legally the buyer is the receiver of the goods and must therefore be notified of any incident affecting him or her. [Translator's note: change to the grammar in the Spanish version only - does not affect the English version)