

**codex alimentarius commission**

FOOD AND AGRICULTURE  
ORGANIZATION OF THE  
UNITED NATIONS

WORLD HEALTH ORGANIZATION

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ECONOMIC COMMISSION FOR EUROPE  
COMMITTEE ON AGRICULTURAL PROBLEMS  
Working Party on Standardization of Perishable Produce

CODEX ALIMENTARIUS COMMISSION

Eleventh Session

Rome, 29 March - 9 April 1976

REPORT OF THE TENTH SESSION OF THE

JOINT ECE/CODEX ALIMENTARIUS GROUP OF EXPERTS ON

STANDARDIZATION OF QUICK FROZEN FOODS

Geneva, 6-10 October 1975

INTRODUCTION

1. The Joint ECE/Codex Alimentarius Group of Experts on Standardization of Quick Frozen Foods held its tenth session at Geneva from 6 to 10 October 1975.
2. Representatives from 23 countries were present: Argentina, Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Federal Republic of Germany, Hungary, Israel, Italy, Japan, the Netherlands, Norway, Philippines, Poland, Spain, Sweden, Switzerland, the United Kingdom and the United States of America. The European Economic Community (EEC) was represented. Non-governmental organizations represented by members of their secretariats were the American Frozen Food Institute, the Association of Official Analytical Chemists (AOAC) and the International Institute of Refrigeration (IIR) (see List of Participants following para 92).

ELECTION OF RAPPORTEUR

3. Dr. R. W. Weik (USA) agreed to act as rapporteur and was so appointed by the Group of Experts.

ADOPTION OF AGENDA

4. The Group of Experts unanimously adopted the Provisional Agenda for the session with a slight change to the order of work. A proposal by the delegation of the United Kingdom that Styles, other than those mentioned in the present standards should be discussed as a separate item, as well as a further suggestion that Date Marking should also be discussed separately, was adopted by the Group of Experts.

MATTERS ARISING FROM REPORTS OF OTHER CODEX SESSIONS Codex  
Committee on Food Additives

5. The Group noted the request of the Codex Committee on Food Additives that provisions in Codex standards for the use of additives be fully justified and be clear and that consideration should be given to the establishment of maximum levels for

contaminants. It also noted that liquid nitrogen and carbon dioxide had been included in Codex List B pending the establishment of specifications and that dichlorodifluoromethane had been given toxicological clearance.

6. As regards contaminants, the Group noted that, in the case of quick frozen fruits and vegetables for which standards had already been established or were under discussion, these would include residues in the ingoing raw materials (e.g. pesticide and fertilizer residues), residues arising during the quick freezing process (e.g. residues possibly from machinery) and, theoretically, residues arising from packaging materials. It was noted that residues of liquid freezants would not be regarded as "contaminants" but as "food additives" or "processing aids". The Group agreed that the standards so far established and under consideration for quick frozen fruits and vegetables, in all probability did not call for a section on contaminants covering *such* residues as arsenic, lead, tin, zinc and iron as quick frozen products did not undergo such processing or packaging as would result in significant amounts of these contaminants. The Group requested governments to send their comments on this preliminary conclusion.

7. As regards liquid freezants, the Group agreed that liquid nitrogen, carbon dioxide and dichlorodifluoromethane were the only three substances used and noted that there was little information on any possible interaction of dichlorodifluoromethane with food on the basis of which to establish maximum levels for this refrigerant in the product. The delegation of the United Kingdom informed the Group that a limit had been set for dichlorodifluoromethane in its country of 100 mg/kg for the fully thawed product.

#### Codex Committee on Food Labelling

8. The Group was informed that the Codex Committee on Food Labelling had accepted the labelling provisions without amendment in the draft standards for quick frozen spinach, peaches and bilberries. However, the Committee had discussed in great detail the meaning of the word "keeping" in the provision which required that "information for keeping and cooking of the product should be given on retail packs". The Committee on Labelling had asked the Group of Experts to "consider in detail whether the intent of the provision was to cover both the whole distribution chain and advice for the consumer, or whether it was limited to the latter".

9. The Group agreed that the information in relation to "keeping" was intended for the benefit of the consumer and that the draft standard for quick frozen cauliflower already contained wording to the effect that "the packages of quick frozen food should bear clear indication as to the way to keep them from the time they are bought at the retailer to that of their use".

10. Further, the Group decided to provide in the standard for spinach, under "Additional Requirements", the mandatory requirement as contained in the draft standard for cauliflower (ALINORM 76/25, App. VIII). However, after further discussion, the Group decided that paras 6.7 and 6.9 in the draft standard for cauliflower should be redrafted into a single paragraph as follows:

##### 6.7 Additional Requirements

The packages shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use as well as directions for cooking".

#### Codex Committee on Food Hygiene

11. The Group was reminded that at its eighth session it had asked the guidance of the Codex Committee on Food Hygiene as to how best the problem of infestation (insects, larvae, etc.) could be dealt with in Codex standards which did not make specific provisions for tolerance for such defects (ALINORM 74/25, para 21). The Committee on Food Hygiene had examined this request and had concluded that specific criteria for such defects could more likely originate with experts in the commodity committee familiar with processing technology. The Group had not found the time to take up this subject at its ninth session.

12. The Group was informed that the Food Hygiene Committee had agreed with the suggestion to require in the section that the products covered by the standards be prepared in accordance with the General Principles of Food Hygiene and had endorsed the hygiene provisions of the following standards contained in ALINORM 76/25: quick frozen spinach, peaches, bilberries and blueberries.

#### Maximum Level of Ascorbic Acid for Quick Frozen Peaches

13. The Group had before it document CX/QFF 75/13 containing comments received from countries concerning the maximum level of ascorbic acid for quick frozen peaches at Step 8. The delegation of USA indicated that single whole frozen peaches would need as much as 1500 mg/kg of ascorbic acid in order to maintain their colour on thawing. The déléation of Switzerland proposed that the maximum limit should be set at 1500 mg/kg, but the Group decided that in order to prevent oxidation, i.e. that the product maintain its colour, the maximum level of ascorbic acid should be set at 750 mg/kg in the final product. The delegation of France indicated that, before it could accept the decision taken by the Group, it would have to discuss the problem further with its authorities and preferred at this point to reserve its position.

#### Declaration of Drained Weight of quick Frozen Foods

14. The Group of Experts had before it document CX/QFF 75/12 and CX/QFF 75/12-Add. I containing government comments on the declaration of drained weight in quick frozen foods.

15. The Group discussed this question in the light of the above comments and noted the position of the Codex Committee on Food Labelling. The Group decided that a declaration of drained weight for quick frozen foods was unnecessary.

16. However, the delegation of Australia disagreed with this decision, because in its opinion the declaration of drained weight was essential so that the consumer was informed of the fruit content. The delegation of the Federal Republic of Germany reaffirmed its position that it was more appropriate to declare the "ingoing fruit content" at the time of packing.

#### DRAFT STANDARD FOR QUICK FROZEN SPINACH

17. The Group had before it the above draft standard contained in App. II, ALINORM 76/25t and had for discussion unresolved issues, of which the Group decided to discuss the first in the light of government comments, i.e. salt-free dry matter and free water (CX/QFF 75/9-Add. I and conference room documents 1 and 2). Concerning the second, Date Marking, the Group had already decided to consider this subject after the item dealing with the survey of frozen food temperatures, - and the third, a definition of Characterizing Ingredients, was Item 11 of the present agenda.

#### Salt-free Dry Matter and Free Water

18. The rapporteur of the collaborating countries which carried out a survey of various types of spinach for salt-free dry matter and free water content, Dr. K. Stoll (Switzerland), gave a resume of the results of the collaborative study. He pointed out that data from five countries from Europe supported the original proposals included in the standard in square brackets. However, some small percentage (i.e. 3 per cent) of quick frozen spinach in countries covered by the survey would not have conformed with the figures for salt-free dry matter and free water in the draft standard (APP. II ALINORM 76/25).

19. After a thorough discussion, the majority of the Group was of the opinion that, although the principle of free water was sound, as there was no reliable method for determining the free water content and since the results from the collaborative study showed considerable variation, any reference to this method should be deleted from the standard. However, in maintaining the present provision for salt-free dry matter, the Group decided, to keep the present limit of 5.5 per cent m/m and to delete the square brackets. The delegations of Australia and the United Kingdom, although agreeing with the decision of the Group to dispense with the free water provision, could not accept a figure higher than 5.0 per cent m/m for salt-free dry matter and these delegations reserved their position.

20. It was further agreed that, although the decision was taken to delete reference to the free water content, investigation should continue to see if a suitable method for determining the free water content could be developed. Only after such investigation had been carried out would the problem be reopened.

21. Following its decision on salt-free dry matter and the redrafting of Section 6.7 Additional Requirements (see para 10 of this report), the Group agreed to ask the Secretariat to make the following editorial changes:

2.1 In front of the word "marketing" in the last line add the word "normal".

3.2.2.1 Should read "mineral impurities such as sand, grit and silt shall be not more than 0.1 per cent m/m, measured on the whole product basis".

3.2.2.3 Free water provision to be deleted.

3.2.4.3 For tables I, II and III in the headings the word "unit" should be deleted and replaced by the word "size".

3.2.5 In the second line the word "unit" should be deleted, and in sub-paragraph (a) in the first line after the word "meet" the words "the requirements of 3.2.1 and . . ." should be added.

6.1 The Name of the Food - a new paragraph as given in paragraph 24 of this report should be inserted.

6.1.2 characterizing Ingredients - the wording of this paragraph should be redrafted according to that of paragraph 86 of this report.

6.7 Keeping and Cooking Directions - the wording should be redrafted according to paragraph 10 of this report.

8.3.2 Free Water Determination - to be deleted.

8.4.3 to 8.4.3.6 Determination of Free Water - to be deleted.

### Status of the Standard for Quick Frozen Spinach

22. The Group agreed to advance the draft standard for quick frozen spinach to Step 8 of the Procedure and asked the Secretariat to ensure that the present amendments were included in the draft standard before it was sent to the Commission at Step 8. The revised text is Appendix I to this report.

### DISCUSSION ON STYLES

23. The Group had before it paragraph 59 of the draft report of the Codex Committee on Fish and Fishery Products concerning the question of styles. It noted that the Fish Committee had agreed to include a provision in its standards which would permit the marketing under the name of the product of styles not listed in the standard. After some discussion the Group agreed that governments should be requested to send their comments on the necessity to include in the Step 8 and Step 9 standards for quick frozen foods the provision proposed by the Fish Committee. The text on which comments are sought follows;

#### Presentation

Any other presentation of the product shall be permitted provided that it:

- (i) is sufficiently distinctive from other forms of presentation laid down in this standard;
- (ii) meets all other requirements of this standard;
- (iii) is adequately described on the label to avoid confusing or misleading the consumer.

24. While noting that point (iii) of the above text provided for an appropriate label declaration of any additional styles sold under the name of the food, the Group decided that the labelling sections of these standards would have to be amended by the addition of a suitable provision to require, the declaration of such additional style (s) in close proximity to the name of the product. A suitable text for such an amendment thought to be as follows:

"If the product is produced in accordance with the section [STYLE] the label shall contain in close proximity to the words [Name of the Product], such additional words or phrases that will avoid misleading or confusing the consumer".

Governments were requested to send their comments on this possible amendment.

25. The Group also agreed that it would consider on a standard by standard basis whether the above text should be included in the various standards at Step 4 or earlier Steps.

### PROPOSED DRAFT STANDARD FOR QUICK FROZEN CAULIFLOWERS

26. The Group considered the above standard (App. VIII, ALINORM 76/25) in the light of government comments (CX/QFF 75/10 and Add. I). The following discussion took place:

#### Presentation

27. The Group discussed styles and whether there was a need to provide for presentation by size in the case of the four styles included in section 2.4.1. It was agreed that there was no need for sizing in the case of "whole" and "split" cauliflowers. In order to expedite discussion the Group requested the delegations of France, The Netherlands, the United Kingdom and the USA to look into this matter and to propose a new text. The

Group received the recommendation of the above delegations that the styles "clusters" and "florets" should be combined under the designation "florets" and that an optional presentation by size be provided for under the designation, "small florets" and "large florets". In addition, the delegations recommended that a tolerance for size be provided in the event of presentation of "florets" by size.

28. The Group adopted the text proposed by the small group of delegations and which has been incorporated in section 2.4.1 of App. II to this report. It also agreed that the text proposed by the Codex Committee on Fish and Fishery Products (see paragraph 23) and the consequential amendment to the labelling section (see paragraph 24) should be included in sections 2.4.2 and 6.1.3 of the standard respectively.

#### General Requirements and Definitions and Tolerances for Defects

29. The Group considered whether the standard should require that the product should be "free" or "practically free" from sand, grit, insect contamination and other foreign material. While it was recognized that the product would probably not be absolutely free from such materials, the Group thought that it might be desirable to delete the word "practically". The Group agreed that it was essential to discuss and to define defects so as to enable governments to make comments on the applicability of the tolerances for these defects. In order to facilitate the consideration of the various government comments and, in particular the detailed comments of the Netherlands, on section 3.2 of the standard, the Group requested the delegations of the Netherlands, the United Kingdom and the USA to examine section 3.2 in the light of these comments and to make proposals for amendments if required

30. The Group received the recommendations of the above working group and amended the standard accordingly. The text of section 3.2 as amended is given in App. II to the report. As regards the standard sample size of 500 g for splits and florets recommended by the working group, the Group agreed with the proposal of the delegation of the USA that the figure of 500 g be placed in square brackets for comment on whether the standard size should be on a number or weight basis. The delegation of Belgium was against the deletion of the word "practically" in section 3.2.1 of the draft standard.

31. The Group also agreed with the proposal of the delegation of the USA to provide for two classes of defects for fibrous product, i.e. "major" with two allowable points and "serious" with four points.

#### Food Additives

32. On the proposal of the delegation of Switzerland, the Group agreed to provide for the additional use of ascorbic acid to prevent discolouration. The Group was of the opinion that, as both citric and ascorbic acids were processing aids used in the blanching or cooling water, and that only traces of these substances would remain in the product, it was not feasible to set a limit for these substances in the final product. It was agreed, therefore, that limitation by GMP would be appropriate.

#### Additional Requirements and Directions for Keeping

33. The Group agreed to combine these two provisions as in the standard for spinach (paragraph 10 of this report).

#### Packaging

34. The Group requested the Secretariat to ensure that this section was brought into harmony with standards adopted earlier (e.g. the standard for spinach).

### Cooking Procedure

35. The Group decided to recommend a cooking time for florets in the light of the decisions reached under Style. A range of three to eight minutes was thought to be appropriate.

### Status of the Standard for Quick Frozen Cauliflower

36. The Group agreed to advance the Proposed Draft Standard for Quick Frozen Cauliflower to Step 5 of the Procedure. The revised text is App. II to this report.

### PROPOSED DRAFT STANDARD FOR QUICK FROZEN BROCCOLI

37. The Group had before it document CX/QFF 75/3 the proposed draft standard for quick frozen broccoli and documents CX/QFF 75/3-Add. 1 and 2 containing government comments on the above draft standard.

### Scope

38. Following a proposal by the delegation of the Netherlands, the Group decided to add the author's name to the Latin name of the species, thus reading Brassica oleracea L. var. italica. Plenck. It was also agreed to add the expression "Sprouting Broccoli" in brackets behind the name to clarify the variety..

### Product Definition

39. The Group also agreed to make similar changes to the name of the product in this paragraph as were made above in Scope.

### Presentation, Essential Composition and Quality Factors

40. In order to facilitate the work of the Group it was decided to ask the author country to redraft the above sections in the light of the written comments received from the Netherlands and the USA and comments made during the session. The revised text of section 2.4 to 3.5 of the standard as adopted by the Group is given in App. III to this report.

### Food Additives

41. The Group considered that it was not necessary to provide for additives in this standard.

### Name of the Food\_\_\_\_\_.

42. In keeping with the decision taken with regard to the spinach standard a new paragraph 6.1.3 was introduced under this provision reading as follows:

"If the product is produced in accordance with section 2.4.2 the label shall contain in close proximity to the word broccoli such additional descriptive words or phrases that will avoid misleading or confusing the consumer".

### Additional Requirements

43. The Group agreed to introduce a similar provision to that proposed for the standard for spinach (see paragraph 10 of this report) on "directions for keeping and directions for cooking".

### Status of the Standard for Quick Frozen Broccoli

44. The Group agreed to advance the draft standard for quick frozen broccoli to Step 5 of the Procedure. The revised text is Appendix III to this report.

RECOMMENDATIONS OF THE WORKING GROUP ON SURVEY OF FROZEN FOOD TEMPERATURES (a) DURING LOCAL DISTRIBUTION (b) IN RETAIL CABINETS.

45. The Group had before it conference room document 12, the report of the working group on survey of frozen food temperatures (App. V). The Chairman of the working group, in introducing the report, mentioned his disappointment that so few countries had cooperated in this last survey but emphasized that the information submitted was extremely useful to the working group. The working group presented its recommendations and suggested- amendments to the draft Code of Practice for Processing and Handling of Quick Frozen Foods, which it hoped would remove the doubts still remaining about a few of the paragraphs in the draft Code of Practice (App. VII, ALINORM -76/25).

46. The Group discussed these issues in considerable detail during which many delegations contributed their views. The delegation of Switzerland considered that the reference in 6.3 of higher temperatures for the top layer should not be deleted. The Group adopted the following amendments to the draft Code of Practice:

(a) Paragraph 1.3 shall now read: "The provisions of this Code of Practice should be interpreted as recommendations, and are intended as a guide to assist in the production and handling of quick frozen foods in order to maintain their quality up to the time of final sale."

(b) Paragraph 5.6 shall now read: "The transport of quick frozen foods for local distribution to retailers should be carried out in such a way that any rise in product temperature above -18 C is kept to a minimum, and should not in any case rise above 2°C (-10.4°F) in the warmest pack". The footnote to be deleted.

(c) Paragraph 5.7 shall now read: "A temperature rise of the product occurring during local transport as indicated in 5.6 should be reduced to -18 C where possible and as soon as possible after delivering. When this is not possible the product should be offered for sale as soon as possible."

(d) Paragraph 6.3 shall now read: "A rise in product temperature may be tolerated for short periods but the product temperature of the warmest pack should not be allowed to become higher than -12 C." The footnote to be deleted.

47. The Group agreed that the amendments should be sent to the Commission since the draft code had already been advanced to Step 8 of the Procedure (ALINORM 76/25, Appendix VII). The delegations of France and Italy disagreed with this decision because they felt that the amendments should have been considered after the results of their survey of quick frozen food temperatures were known.

48. The Group felt that the formulation of the Code of Practice only partially solved the problems in this field, notably those connected with the effects of the time and temperature aspects of storage or product quality. Since the quick frozen food industry was expanding so rapidly, and moreover, since technical improvements would occur in the future, the Group accordingly agreed to set up a new working group on Temperature and Quality Control, with Australia, Denmark, the Federal Republic of Germany, the Netherlands and the United Kingdom as members, the latter country to act as co-ordinator. The terms of reference of the working group was to review the position in the light of information supplied by governments, paying particular attention to weak points in the distribution chain for quick frozen foods as it actually exists, and to present a paper to the next session of the Group incorporating recommendations for improvements, taking account of economic and other aspects.

49. The working group met during the course of the session to consider what information was required from member countries in order to prepare the paper to be presented at the next session. The working group recommended that countries should be asked to:

(a) arrange for a number of packs of quick-frozen chicken, cod, and green beans to be purchased under normal shop conditions, and assessed for quality, the assessment being made, if possible, in conjunction with an ordinary consumer. When reporting results, countries should, where it is possible to do so, give an indication of the period the packs had remained in the retail cabinet before purchase;

(b) state this country's policy over the next five years for dealing with the problems encountered in the field of time/temperature control;

(c) supply details of any relevant research carried out in their countries by organizations, whether official, private or commercial.

50. The Group of Experts endorsed these recommendations and instructed the Secretariat to issue an appropriate questionnaire, the form to be determined by the working group.

51. The Group also accepted the proposal of the delegation of the United States to develop a proposed draft guide for local handling (i.e. from the time of loading for local transport up to and including storage in retail cabinets). Other countries were requested to furnish any available information to the United States.

52. The Group also considered that the quality of quick frozen foods, as described in the individual Codex standards, was not only related to the Code of Practice for the Processing and Handling of Quick Frozen Foods, which ensured that the quality was maintained, but depended also on the equipment used in transporting and storing quick frozen foods. The Group noted that various international bodies, notably IIR and ISO, were concerned with this problem. The Group agreed that these and other bodies should be informed of the problems relating to equipment and quality and that liaison should be established with them. Governments were urged to support scientific investigations concerning the cold chain and quick frozen food technology in order to obtain data on the basis of which the question of quick frozen foods could be reviewed.

#### DATE MARKING

53. The Group had briefly discussed date marking for quick frozen foods at its ninth session (ALINORM 76/25, paragraph 19) and, realizing its wide implications, had submitted the subject for consideration to the Committee on Labelling. At its tenth session, the Labelling Committee was able to elaborate "Guidelines for Labelling Provisions in Codex Commodity Standards relative to Date Marking" and this document has been circulated to governments for comments (ALINORM 76/22, Appendix III).

54. In taking note of this development the Group discussed the usefulness of adopting date marking for quick frozen foods. Some delegations expressed support for date marking provisions in the standards, while other delegations were of the opposite view. The Group felt that because of the general uncertainty about the information available on aspects of the distribution and handling of quick frozen foods, it was unable to decide on the need for date marking for quick frozen foods at this stage, and decided to wait for more information to be expected from the working group mentioned in paragraphs 50-52 above, and for the Committee on Labelling to finalize its guidelines and for the Commission to adopt them.

## PROPOSED DRAFT STANDARD FOR QUICK FROZEN LEEK

55. The Group had before it the above standard redrafted by the Netherlands (CX/QFF 75/8) and comments by Denmark (AGRI/WP.I/GE.3/CRP.10). The following amendments were made to the standard:

### Product Definition

56. The square brackets were deleted from the word "normal".

### Presentation

57. After detailed discussion the Group agreed to provide for five styles as follows:

#### 2.4.1 Styles

- (a) Whole leek - the intact leek plant with roots and non-tender leaves removed.
- (b) Leek - parts of the whole leek with a length, corresponding to longest dimension of the package, but not less than [7] cm.
- (c) Cut leek - parts of the whole leek, cut perpendicularly to the longitudinal axis, minimum length [20] mm, maximum length [6] cm.
- (d) Leek rings - parts of the whole leek cut perpendicularly to the longitudinal axis into slices, not thinner than [10] mm and not thicker than [20] mm.
- (e) Chopped leek - the whole leek chopped into pieces, such that the original structure is almost entirely lost, resulting in a "unit" generally smaller than [10] mm in width.

2.4.2 Any other presentation of the product shall be permitted provided that it:

- (i) is sufficiently distinctive from other forms of presentation laid down in this standard;
- (ii) meets all other requirements of this standard;
- (iii) is adequately described on the label to avoid confusing or misleading the consumer.

### Sizing

58. The Group discussed whether it was feasible to size grade the various styles of leeks. As it was clear that chopped leek could not be size graded, this style was deleted from section 2.4.3.1. The Group agreed that the question of size grading would have to be discussed at the next session.

### Definition of Visual Defects

59. As regards the defect "Poorly trimmed" some delegations were of the opinion that reference should be made to the fact that poor trimming resulted in a less tender product. The Group agreed that the first part of this defect definition should be placed in square brackets and that this definition should be rediscussed in the light of comments.

### Standard Sample Size

60. The Group agreed, in view of the changes to section 2.4.1, that the following new standard sample sizes should be submitted to governments for comments:

Whole leek	[500 g but not less than two pieces]
Leek and cut leek	[500] g
Leek rings	[300] g

Chopped leek [300] g

It was also agreed that the demerit points for the various defect categories should be reconsidered in the light of the new standard sample sizes.

### Tolerances for Sizing

61. The Group decided to delete reference to expression by mass and also agreed that this section should be reconsidered in the light of changes to the sections on styles and sizing.

### The Name of the Food

62. A new section 6.1.5 was inserted as a consequential amendment in the same way as in the standard on cauliflower (see paragraph 24 of this report).

### Additional Requirements

63. The Group agreed that section 6.7 should be redrafted as in the standard for cauliflower (see paragraph 10 of this report).

### Status of the Proposed Draft Standard for Quick Frozen Leek

64. The Group agreed that the above standard should be advanced to Step 5 of the Codex Procedure. The revised text is contained in Appendix IV to this report.

### CONSIDERATION AT STEP 4 OF THE METHOD FOR CHECKING TEMPERATURE OF QUICK FROZEN FOODS

65. The Group had before it document CX/QFF 75/4 which contained the above-mentioned procedure as redrafted by the United States, and document CX/QFF 75/4 Add.I – the written comments of the Netherlands on the draft procedure.

66. The Group agreed that the methods outlined were not appropriately described by the word "guidelines" and made an editorial adjustment to the Scope section. Two methods were recommended for temperature measurement, namely a Referee method for measuring product temperature and a Routine method for measuring surface temperature of the product. It was agreed that the Scope section should be suitably amended editorially to make this clear.

67. In paragraph 3 General Specification for Temperature Measuring Instruments, sub-paragraph (e), the reference to 0.2<sup>o</sup>c was altered to read 0.5<sup>o</sup>C. In paragraph 4, Equipment for Measuring Temperature, the Group agreed that the final paragraph of 4.1 should become an introductory sentence and be amended to read:

"Glass stem thermometers are not recommended for routine testing, but where used they should be used with great care in the proximity of food."

As well, the references to (250 mm), (150 mm) and (150 mm) in the text should be deleted. Paragraph 4.3 was amended to read:

#### 4.3 Electrical Thermometer

Electrical resistance or thermocouple as the sensing element, The overall length of the probe or blade should be about 15 cm. The sensing element of the electrical thermometer should have the following characteristics:

- (a) A stainless steel sensitive part - either probe or blade type;
- (b) Leads of known resistance or, preferably, leads with built-in compensation resistance."

68. The Group decided to write the following introduction into paragraph 6 as proposed by the Netherlands:

## "Procedure for Measuring Temperature in the Product - Referee Method

6.1 Reliable information on the temperature of a product can be obtained only by measuring the temperature in the product.

6.2 The product temperature shall be measured at any point in the product which is 2.5 cm below the surface, in the case of packages with one dimension less than 5 cm, the measurement point should be halfway through this dimension."

69. The Group agreed with the delegation of the United Kingdom that section 6.5 should contain directions about the place of the product when the temperature testing was carried out, and agreed to include as a new section the following text:

"For an accurate temperature measurement it is essential that the formation of the hole and subsequent temperature readings in the product with the sensing element are carried out with the product in the refrigerated environment from which it was selected, or in ambient conditions as close as possible to that environment."

70. In the introduction of paragraph 7 Procedure for Measuring Surface Temperature of the Product - Routine Method, the Group decided to place the temperature + 1 C in square brackets, and to introduce a new sentence possibly a new 7.1 to read:

"7.1 A reasonable approximation as to the temperature of the product can be obtained by measuring the temperature at the surface of the product."

Paragraph 7.4 was amended to read "stack addition cases of the frozen product obtained from the same general location on top of the test case in order to ensure good thermal contact with the sensing element."

71. As regards Figure 3 referred to in paragraph 8.3 Vehicles or Transport Container Unit, the delegation of the United Kingdom was of the opinion that it was sufficient to measure temperature in only six locations in a car or truck. It was noted that there were many types of vehicles used in the transport of quick frozen foods and that consideration should be given to the location of doors and also to the fact that the temperature of air in the vehicles varied from point to point in the vehicle. The Group agreed to place reference to Fig. 3 in square brackets and to -reconsider this question in the light of comments and information supplied by governments.

72. The Group decided to delete the first two sentences in paragraph 8.4 Retail Display Cabinets and also to delete Figure 4 in Appendix I, as the ISO method applied to checking the suitability of the equipment rather than checking product temperature and as the second sentence was not in conformity with the Code of Practice for the processing and Handling of Quick Frozen Foods.

73. The Group asked the Secretariat to bring to the attention of the Inland Transport Committee of the Economic Commission for Europe its work on the Draft Code of Practice for the Processing and Handling of Quick Frozen Foods, and the Procedure for Checking Temperature- of Quick Frozen Foods.

## Status for the Method for Checking Temperature of Quick Frozen Foods

74. The Group decided to advance the above method to Step 5 of the Codex The revised text is contained in Appendix VI to this report.

## JUSTIFICATION FOR THE ESTABLISHMENT OF NEW CODEX STANDARDS Quick Frozen Red Sour Cherries

75. The Group had before it a revised draft standard (CX/QFF 75/5rAdd. I) and a

Paper containing trade statistics (CX/QFF 75/5). After some discussion the Group agreed that, in view of the fact that this product was used mainly in further processing and sold in bulk packs, there was no need at the moment to elaborate a standard for quick frozen sour cherries.

#### Quick Frozen Fried Potatoes

76. The Group considered several papers submitted by Australia concerning justification for elaborating a Codex standard for this product (CX/QFF 75/7. Add. I and Add.2). It was agreed that there was sufficient justification to elaborate a Codex standard and that, furthermore, it was a product which should be standardized as early as possible.

77. During the preliminary discussion of the Australian draft, the following points were made:

- (i) The standard should make it quite clear to what species the standard applies, paying particular attention to the French and Spanish texts.
- (ii) The process definition should receive particular attention in the redraft.
- (iii) In section 3»4.6(a) the figures 10 mm . . . 8 mm should be reversed.

78. The Group agreed that the draft standard prepared by Australia should be revised on the basis of (a) general decisions reached in connection with other standards written comments received from governments and international organizations (e.g. European Union of Potato Industries) and (c) the comments made during the session. The revised text should then be sent to governments at Step 3 for comments.

#### Quick Frozen Carrots

79. The Group had before it document CX/QFF 75/11, the proposed draft standard for quick frozen carrots as prepared by the author country, the Netherlands.

80. Although volume of production and consumption data were not available, the Group satisfied itself that such a standard should be elaborated. The delegate of the Netherlands said that his country had a significant trade and there was a demand for different styles. Other delegations agreed with this reasoning.

81. It was therefore decided that the draft standard should be advanced to Step 3 and circulated to governments for comment.

#### Quick Frozen Corn-on-the-Cob

82. The Group considered the proposed draft standard for quick frozen corn-on-the-cob as prepared by the author country, Sweden, and outlined in document CX/QFF 75/6.

83. The delegation of Sweden said that it had contacted Italy, Hungary and the United States, but information was meagre and trade statistics on this product were difficult to obtain. The delegation of Israel and others thought that to have a standard for quick frozen cut corn as well as corn-on-the-cob would be most useful. The delegation of the United States agreed with the suggestion of these delegations but emphasized that it would be essential to have separate standards for each product.

84. The Group, in agreeing that such standards should be elaborated, decided to accept the offer of the delegation of the United States to prepare a draft standard for "Cut Corn" and at the same time accepted the present draft for "Corn-on-the-Cob" from Sweden. Both these draft standards would be advanced to Step 3 for a round of government comments.

## DEFINITION OF CHARACTERIZING' INGREDIENTS

85. The Group considered the definition of a "characterizing ingredient" proposed by the delegation of the United States (ALINORM 76/25, paragraph 122), in the light of government comments (CX/QFF 75/14). While it was recognized that the question of characterizing ingredients represented a problem which was not exclusive for quick frozen products, the Group noted that the definition had been elaborated with particular reference to quick frozen foods.

86. The Group decided that the definition proposed by the United States of America, redrafted as given below, should replace section 6.1.2 of the Draft Standard for Quick Frozen Spinach: "Where any ingredient, other than salt, has been added which imparts to the food the distinctive flavour of that ingredient, the name of the food shall be accompanied by the term 'with x' or 'x flavoured", as appropriate.

87. It was also agreed that the definition of characterizing ingredients should be submitted to the Codex Committee on Food Labelling with a request to decide (i) if the definition as applied to spinach would be applicable and (ii) if the definition would be applicable as a guide to other Codex Committees. The definition proposed by the United States of America follows:

"Any ingredient which, when added to another food, imparts to such food the distinctive flavour of the ingredient. Salt and sugar, when added in the small amounts customarily used in culinary practice, merely enhance the normal flavour of the food to which they are added, but do not give the food a new or different flavour. Examples would be!

Frozen peas with mint essence  
Cinnamon flavoured apple jelly  
Canned peaches with rum flavour

On the other hand, vanilla flavouring in milk chocolate would not be a characterizing ingredient."

## PROGRAMME OF FUTURE WORK

88. The Group in enumerating its future work programme was concerned at the number of commodities of importance in international trade and on which considerable work was still necessary. On a time basis, it was possible that the list of work which follows below would be too great for the agenda of the next session. However, the Group agreed that the decision about future work should be left for discussion between the Chairman and the secretariat. The list of work in general order of importance to the Group was as follows:

			<u>Author Country</u>
Draft Code of Practice for the Processing and Handling of Quick frozen Foods (Further work on Survey of Temperature of Quick Frozen Foods)	Step 8		U. K. (and Working Group)
Guide for Handling Quick Frozen Food during Local Distribution Date Marking	To be elaborated		U. S. A.
Quick Frozen Cauliflower	Step 5		U. S. A.

Quick Frozen Broccoli	Step 5	U. S. A.
Quick Frozen Leeks	Step 5	The Netherlands
Quick Frozen Green Beans	Step 3	U. K.
Quick Frozen Brussels Sprouts	Step 3	U. K.
Quick Frozen Fried Potatoes	Step 3 <sup>1</sup>	Australia
Quick Frozen Carrots	Step 3	The Netherlands
Quick Frozen Corn-on-the-Cob	Step 3 <sup>2</sup>	Sweden
Quick Frozen Cut Corn	Step	U. S. A.
Procedure for Checking Temperature of Quick . Frozen Foods	Step 5	

<sup>1</sup> After revision by the author country.

<sup>2</sup> After preparation by the author country.

89. With regard to the draft standards for quick frozen green beans and Brussels sprouts, the Group noted that governments had been requested to send comments on both standards and that more comments were still likely to be received. The rapporteur (United Kingdom) agreed to consider all the comments received at Step 3 and to prepare a revised version of both draft standards for consideration at the next session.

90. The Group took note of the proposal of the United States of America to elaborate a draft standard for "cut corn" or "Whole kernel corn". It was anticipated that the draft standard would be submitted to governments for comments at Step 3 and would be considered at the next session.

#### DATE AND PLACE OF NEXT SESSION

91. The Group noted that the Eleventh Session would be held in March 1977, probably in Geneva.

#### ELECTION OF CHAIRMAN AND VICE-CHAIRMAN

92. The Group of Experts unanimously reelected Mr. T. van Hiele (Netherlands) as Chairman of the session. Mr. W. Orlovski (Poland) was unanimously re-elected as Vice-Chairman, both to serve from the end of the tenth session to the end of the eleventh session.

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DRAFT STANDARD FOR QUICK FROZEN SPINACH  
(Advanced to Step 8 of the Procedure)

1. SCOPE

This standard shall apply to quick frozen spinach of the species Spinacia cleracea L. as defined below and offered for direct consumption without further processing except for repacking if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes

2. DESCRIPTION

2.1 Product Definition

Quick frozen spinach is the product prepared from fresh, clean, sound edible parts of the spinach plant conforming to the characteristics of the species Spinacia cleracea L., and which have been sorted, washed, sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles and properly drained.

2.2 Process Definition

Quick frozen spinach is the product subjected to a freezing process in appropriate equipment and complying with the conditions laid down hereafter. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached -18°C (0°F) at the thermal centre after thermal stabilization.

The recognized practice of repacking quick frozen products under controlled conditions is permitted.

2.2 Handling Practice

The product shall be handled under such conditions as will maintain the quality during transportation, storage and distribution up to and including the time of final sale. It is recommended that during storage, transportation, distribution and retail, the product be handled in accordance with the provisions in the Code of Practice for the Processing and Handling of Quick Frozen Foods.

2.3 Presentation

2.4.1 Style

- (a) Whole Spinach - the intact spinach plant with root removed.
- (b) Leaf Spinach - substantially whole leaves most of which are separated from the root crown.
- (c) Cut-Leaf Spinach - parts of leaves of spinach generally larger than 20 mm in the smallest dimension.
- (d) Chopped Spinach - parts of leaves of spinach cut into small pieces generally less than 10 mm in the largest dimension, but not comminuted to a pulp or puree - i.e. pieces smaller than 3 mm in dimension.

- (e) Pureed Spinach (Spinach Purée) - spinach finely divided or finely chopped or having passed through a sieve such that the leaf particles are less than 3 mm dimension.

#### 2.4.2 Other Styles

Any other presentation of the product shall be permitted provided that it:

- (a) is sufficiently distinctive from other forms of presentation laid down in this standard;
- (b) meets all other requirements of this standard;
- (c) is adequately described on the label to avoid confusing or misleading the consumer.

### 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

#### 3.1 Optional Ingredients

Salt (Sodium Chloride)  
Condiments, such as spices and herbs.

#### 3.2 Quality Factors

##### 3.2.2 General Requirements

Quick frozen spinach shall:

- have a reasonably uniform green colour characteristic of the variety;
- be clean, sound and practically free from foreign matter;
- be free from foreign flavour and odour, taking into consideration any added optional ingredients;
- be practically free from fibrous material and for the styles of Whole, Leaf and Cut Leaf not materially disintegrated due to mechanical damage,

and with respect to Visual defects or other defects subject to a tolerance shall be:

- practically free from sand and grit;
- well drained and contain no excess water;
- practically free from loose or detached leaves in Whole style only;
- reasonably free from discoloured leaves or portions thereof;
- reasonably free from flower stems (seed heads)
- reasonably free from flower buds;
- reasonably free from crown and portion thereof, except for Whole spinach;
- practically free from root material;
- reasonably free from extraneous vegetable material (EVM).

##### 3.2.2 Analytical characteristics

- (a) Mineral impurities such as sand, grit and silt shall be not more than 0.1 per cent m/m, measured on the whole product basis.
- (b) Salt-free dry matter - not less than 5«5 Per cent m/m.

##### 3.2.3 Definition of Visual Defects

- (a) Loose leaves (whole style only) - leaves which are detached from the crown; -
- (b) Discolouration - discolouration of any kind on the leaves or stem portions and which materially detracts from the

- appearance of the product;
- |     |                                     |  |
|-----|-------------------------------------|--|
|     | Minor                               | - discolouration which is light in colour  |
|     | Major                               | - discolouration which is dark in colour   |
| (c) | Extraneous vegetable material (EVM) | - harmless vegetable material such as grass, weeds, straw, etc.                        |
|     | Minor                               | - EVM which is green and tender;   |
|     | Major                               | - EVM -which is other than green or is course;   |
| (d) | Seed heads (flower stems)           | - the flower bearing portion of the spinach plant, which is longer than 25 mm; -       |
| (e) | Flower buds                         | - the separate flower buds detached from the seed head;                                |
| (f) | Crowns (exclusive of whole style) - | - the solid area of the spinach plant between the root and the attached leaf clusters; |
| (g) | Root material -                     | - any portion attached to of the root, either loose or leaves.                         |

#### 3.2.4 Standard Sample Sizes

The standard sample size for segregating and evaluating visual defects shall be as follows:

<u>Style</u>	<u>Standard Sample Size</u>
Whole and Leaf	300 grammes
Cut leaf	300 grammes
Chopped	100 grammes
Pureed	100 grammes

#### 3.2.5 Method of Examination

For separation and enumeration of Visual defects the test sample (standard sample size) is placed in water in a deep tray, and the leaves or leaf portion separated one by one.

#### 3.2.6 Tolerances for Visual Perfects

For tolerances based on the standard sample sizes indicated in Section 3.2.4, Visual defects shall be assigned points in accordance with the appropriate table in this section. The maximum number of defects permitted is the Total Point Allowance rating indicated for the respective categories Minor, Major and Serious or the Combined Total of the foregoing categories.

**TABLE I**  
**Whole Leaf and Cut Leaf Style**  
(Standard Sample Size 300 grammes)

Defect	Unit of Measurement	Defect Categories			
		Minor	Major	Serious	Total
(a) Loose Leaves (whole style only)	Each Leaf	1			
(b) Discolouration	Each 4 cm <sup>2</sup>				
	Minor	1			
	Major		2		
(c) EVM	Each 5 cm				
	Minor	1			
	Major		2		
(d) Seed heads	Each whole head		2		
	Each portion	1			
(e) Crowns (exclusive of whole style)	Each whole crown		2		
	Each part	1			
(f) Root material	Each piece			4	
TOTAL ALLOWABLE POINTS		20	10	4	20

**TABLE II**  
**Chopped Style**  
(Standard Sample Size 100 grammes)

Detect	Unit of Measurement	Defect Categories		
		Minor	Major	Total
(a) Discolouration	Each cm <sup>2</sup>			
(b) EVM	Each 1 cm			
	Minor	1		
	Major		2	
(c) Flower Buds	Each 50 pieces	1		
(d) Crown material	Each piece		2	
(e) Root material	Each piece		2	
TOTAL ALLOWABLE POINTS		20	10	20

**TABLE III**  
**Pureed Style**  
(Standard Sample Size 100 grammes)

Defect	Allowance
Any dark particle or flower bud	Shall not affect the overall appearance of the product.

### 3.3 Definition of "Defective" for Quality Factors

Any sample unit taken in accordance with the Sampling Plans for Prepackaged Foods, and which is adjusted to a standard sample size for applying the tolerances

relating to "Visual Defects", shall be regarded as "defective" for the respective characteristics as follows:

- (a) any sample unit that fails to meet the requirements of 3.2.1 and the analytical requirements of Section 3.2.2;
- (b) any sample unit that fails the Total Allowable Points for Defect Categories Minor, Major or Serious; or which fails the Total Point Allowance for the combined Total of the respective defect Categories as given in Section 3.2.4.

#### 3.4 Lot Acceptance for Quality Factors

A lot is considered acceptable when the number of "defectives" as defined in Section 3.3 does not exceed the acceptance number (c) for the appropriate sample size as specified in the "Sampling Plans for Prepackaged Foods"(Ref. N° CAC/RM 42-1969). In applying the acceptance procedure each "defective" (sub-paragraph (a) or (b) of Section 3.3) is treated individually for the respective characteristics.

#### 4. FOOD ADDITIVES

None permitted.

#### 5. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared in accordance with General Principles of Food Hygiene {Ref No CAC/RCP 1-1969} recommended by the Codex Alimentarius Commission.

#### 6. LABELLING

In addition to sections 1,2,4 and 6 of the General Standard for the Labelling of Prepackaged Foods (Ref. No. CAC/RS I-1969) the following provisions apply

##### 6.1 The Name of the Food

6.1.1 The name of the food as declared on the label shall include "whole spinach", "leaf spinach", "cut leaf spinach", "chopped spinach" or "spinach puree".

6.1.2 If the product is produced in accordance with section 2.4.2 the label shall contain in close proximity to the word "spinach" such additional words or phrases that will avoid misleading or confusing the consumer.

6.1.3 When any ingredient, other than salt, has been added which imparts to the food the distinctive flavour of the ingredient, the name of the food shall be accompanied by the term "with x" or "x flavoured", as appropriate.

The words "quick frozen" shall also appear on the label, except that the term "frozen" may be applied in countries where this term is customarily used for describing the product processed in accordance with section 2.2 of the standard.

<sup>1</sup> "Frozen" is this term is used as an alternative to "quick frozen" in

6.1.4 English speaking countries.

##### 6.2 List of Ingredients

A complete list of ingredients shall be declared, in descending order of proportion in accordance with section 3.2 (c) of the General Standard for the Labelling of Prepackaged Foods (Ref. No. CAC/RS 1-1969).

### 6.3 Net Contents

The net contents shall be declared by weight in either the metric System ("Système International" units) or avoirdupois or both Systems of measurement as required by the country in which the food is sold.

### 6.4 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared.

### 6.5 Country of Origin

The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

### 6.6 Lot Identification

Each container shall be embossed or otherwise permanently marked, in code or in clear, to identify the producing factory and the lot.

### 6.7 Additional Requirements

The packages shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use, as well as directions for cooking.

### 6.8 Bulk Packs

In the case of quick frozen spinach in bulk the information required in sections 6.1 to 6.6 shall either be placed on the container or to be given in accompanying documents, except that the name of the food accompanied by the words "quick frozen" (the term "frozen" may be used in accordance with section 6.1.4 of this standard) and the name and address of the manufacturer or packer shall appear on the container.

## 7. PACKAGING

Packaging used for quick frozen spinach shall:

- (a) Protect the organoleptic and other quality characteristics of the product;
- (b) Protect the product against micro-biological and other contamination;
- (c) Protect the product from dehydration and, where appropriate, leakage as far as technologically practicable;
- (d) Not pass on to the product any odour, taste, colour or other foreign characteristics, throughout the processing (where applicable) and distribution of the product up to the time of final sale.

## 8. METHODS OF EXAMINATION. ANALYSIS AND SAMPLING

### 8.1 Sampling

Sampling shall be carried out in accordance with the Sampling Plans for Prepackaged Foods (AQL-6.5) (Ref. No. CAC/RM 42-1969).

### 8.2 Thawing Procedure

According to the FAO/WHO Codex Alimentarius Standard Procedure for Thawing of Quick Frozen Fruits and Vegetables (Ref. No. CAC/RM 32-1970).

8.3 Determination of Net Weight. According to the FAO/WHO Codex Alimentarius Method CAC/RM 34-1970 "net weight determination of frozen fruits and vegetables"

(See Recommended International Standard for Quick Frozen Peas, Section-8.3, CAC/RS 41-1970.

#### 8.4 Determination of Salt-Free Dry Matter

8.5.1 Determine the total dry matter of the product by drying over sand for 4 hours at 105°C.

8.5.2 From the value obtained in 8.4.1 deduct the amount of salt (NaCl) determined by either (a) electrometric titration using a pH meter with a silver electrode; or (b) direct titration with Ag NO<sub>3</sub>.. Express the result, after deducting salt from total dry matter, as "Salt-free Dry Matter".

#### 8.5 Determination of Mineral Impurities

##### 8.5.1 Principle of Method

This method describes a procedure by which sand and other earthy material is separated from plant tissue by a process of flotation and sedimentation. The sand being heavier sinks to the bottom of the receptacle and the residues is then collected, incinerated, weighed, and reported as Mineral Impurities.

##### 8.5.2 Apparatus

Blendor or macerator (Atomix, Turmix, Waring or equivalent)

Beakers — 2,000 ml capacity

Funnels

Filter paper, Whatman No. 1 or equivalent

Porcelain or platinum crucible

Air oven or bunsen burner

Muffle furnace (600°C)

Dessicator with active dessicant

Analytical balance

##### 8.5.3 Reagents

NaCl solution (15 per cent w/v)

##### 8.5.4 Preparation of Test Sample (Analytical Sub.)

###### (a) Fruit Products

Containers of 500 g or less - use the entire contents. Comminute in blendor and transfer the entire mixture to the first beaker, using small quantities of water to assure complete transfer of material.

Containers larger than 500 g - thoroughly mix the contents of the entire container and quickly remove a representative 500 g portion» Blend and transfer as specified in (a).

###### (b) Vegetable Products

The method is similar to that specified in 8.5.4 (a) for fruit products except that the analytical sub. is 250 g. After the sub. is placed in the blendor a small amount of water may be necessary to facilitate maceration of the material,

##### 8.5.5 Procedure

(1) Transfer the analytical sub to a 2-L beaker taking care to include any sand that might settle out.

- (2) Nearly fill the beaker with water and mix contents by swirling, using a stirring rod if needed.
- (3) Let stand about 10 minutes and decant supernatant material and water into a second 2-L beaker.
- (4) Refill the first beaker with water, repeat the mixing and swirling operation and again let set 10 minutes.
- (5) Fill the second beaker with water, mix and swirl, and let stand 10 minutes.
- (6) At the end of the 10 minute period decant beaker No. 2 into beaker No. 3. Likewise decant beaker No. 1 in beaker No. 2.
- (7) Repeat the sequence carefully decanting supernatant from beaker No. 3 into sink, until all fruit tissue is removed from the sample.
- (8) Finally collect the residue from all the beakers in beaker No. 3.
- (9) Remove any seeds or fruit tissue that settle out by treating the residue in beaker No.3 with hot 15% w/v NaCl solution.
- (10) Remove NaCl by washing with hot water. Removal can be verified by testing the washings with  $\text{AgNO}_3$
- (11) Finally transfer residue remaining in Step (10) to a funnel fitted with ashless filter paper. Use small portion of water to assure transfer of all residue. Discard filtrate.
- (12) Transfer filter paper to a weighed crucible. Dry in air oven or oven bunsen burner, I gnite in muffle furnace for about 1 hour at  $600^\circ\text{C}$ .
- (13) Cool in dessicator and weigh.
- (14) The weight of water insoluble residue is determined by subtracting, the weight of the empty crucible from the weight of the crucible plus incinerated residue.

#### 8.5.6 Expression of Results

Express the residue of mineral impurities on the basis of –mg per kilogramme. If the test sample is 500 g, multiply the value (in mg) obtained in Step (14) by two (2). If the test sample is less than 500 g, use the following formula :

$$X = \frac{1000}{W} R$$

in which

X = mineral impurities (mg/kg)

W = weight of test sample (g)

R = residue remaining after incineration (mg)

## APPENDIX II

### PROPOSED DRAFT STANDARD FOR QUICK FROZEN CAULIFLOWER (Advanced to Step 5 of the Procedure)

#### 1. SCOPE

This standard shall apply to quick frozen cauliflower of the species Brassica oleracea L. var. Botrytis L. as defined below and offered for direct consumption without further processing, except for repacking, if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes.

#### 2. DESCRIPTION

##### 2.1 Product Definition

Quick frozen cauliflower is the product prepared from fresh, clean, sound heads of the cauliflower plant conforming to the characteristics of the species Brassica oleracea L. var. botrytis L., which heads may be trimmed and separated into parts, and which are washed and sufficiently blanched to ensure stability of colour and flavour during normal marketing channels.

##### 2.2 Process Definition

Quick frozen cauliflower is the product subjected to a freezing process in appropriate equipment and complying with the conditions laid down hereafter. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ) at the thermal centre after thermal stabilization.

The recognized practice of repacking quick frozen products under controlled conditions is permitted.

##### 2.3 Handling Practice

The product shall be handled under such conditions as will maintain the quality during transportation, storage and distribution up to and including the time of final sale. It is recommended that during storage, transportation, distribution and retail, the product be handled in accordance with the provisions in the Code of Practice for the Processing and Handling of Quick Frozen Foods.

##### 2.4 Presentation

###### 2.4.1 Style

(a) whole - the whole, intact head, which is trimmed at the base and which may have attached small, tender, modified leaves.

(b) Split - the whole head, cut vertically into two or more sections.

(c) Florets - segments of the head, which may have a portion of the secondary stem attached, measuring at least 15 mm across the top in the greatest dimension. Small, tender, modified leaves may be present or attached to the units.

###### 2.4.2 Other Styles

Any other presentation of the product shall be permitted provided that it:

- (a) Is sufficiently distinctive from other forms of presentation laid down in this standard;
- (b) meets all other requirements of this standard;
- (c) is adequately described on the label to avoid confusing or misleading the consumer.

#### 2.4.3 Sizing

- (a) Large florets - segments of head which may have a portion of secondary stem attached measuring at least 30 mm across the top in the greatest dimension; small tender modified leaves may be present or attached to the unit.
- (b) Small florets - segments of head which may have a portion of secondary stem attached measuring at least 15 mm but less than 30 mm across the top in the greatest dimension. Small tender modified leaves may be present or attached to the unit.
- (c) When cauliflower is presented as sized, a tolerance of 20 percent by weight is permitted as not conforming to the size indicated on the package.

### 3 ESSENTIAL COMPOSITION AND QUALITY FACTORS

#### 3.3 Optional Ingredients

salt (sodium chloride)  
condiments, such as spices and herbs

#### 3.4 Quality Factors

##### 3.2.1 General Requirements

Quick frozen cauliflower shall be:

- of reasonably uniform white to cream colour over the tops of the units which may be slightly dull and have a tinge of green, yellow or pink. The stem or branch portions may have a tinge of green or blue;
- free from foreign flavour or odour, taking into consideration any added optional ingredients ;
- clean, free from sand, grit and other foreign material; and with respect to Visual Defects or Other Defects subject to a tolerance shall be:
  - reasonably free from discoloured areas confined essentially to the surface;
  - reasonably free from damaged or blemished areas;
  - reasonably free from fibrous stems;
  - reasonably free from poorly trimmed units;
  - reasonably free from fragments;
  - reasonably compact and well developed; for cluster and floret styles:
  - practically free from loose stems.

##### 3.2.2 Definition of Visual Defects

- (a) Discolouration
  - grey brown, green or similar discolouration confined essentially to the flower surface of the unit and which materially detracts from the appearance of the product. Branches or stems with a bluish or greenish tinge are not to be considered as discoloured.

- |     |                          |   |
|-----|--------------------------|---|
|     | <u>Light</u>             | - the discolouration disappears almost entirely upon cooking., Each are a or combined area of [8] cm <sup>2</sup> =1 defect.  |
|     | <u>Dark</u>              | - the discolouration does not disappear upon cooking. Each area or combined area of [4] cm <sup>2</sup> = 1 defect.   |
| (b) | <u>Damage or blemish</u> | - due to pathological, mechanical or insect injury, and which may extend into the cauliflower = 1 defect.   |
|     | <u>Minor</u>             | - the appearance of the unit (s) is affected to only a slight degree. Each area or combined area of [8]cm <sup>2</sup> = 1 defect.  |
|     | <u>Major</u>             | - the appearance of an individual unit is materially affected = 1 defect.   |
|     | <u>Serious</u>           | - the appearance of an individual unit is objectionably affected to such an extent that it would customarily be discarded under normal culinary preparation = defect.                     |
| (c) | <u>Fibrous</u>           | <u>Major</u> - a unit that possesses tough fibres or tough strings that are quite noticeable and materially affect the eating quality = 1 defect.   |
|     |                          | <u>Serious</u> - a unit that possesses tough fibres or tough strings that are very objectionable and of such nature that it would be customarily discarded= 1 defect.                     |
| (d) | <u>Poorly trimmed</u>    | - any unit that has deep-knife gouges, or has a ragged appearance, or has large green or discoloured coarse leaves = 1 defect..   |
| (e) | <u>Fragments</u>         | - portions of the flowerpart 5 mm or less across the greatest diameter (for tolerance see foot of Tables I & II).   |
| (f) | <u>Not compact</u>       | - a unit in which the florets are spreading and/or the flowerhead has a "ricey" appearance or which is very soft or mushy. Each area or combined area of [12] cm <sup>2</sup> = 1 defect. |
| (g) | <u>Loose stems</u>       | - detached from the cauliflower unit exceeding 5 mm or more in any dimension = 1 defect.  |

### 3.2.3 Standard Sample Size

Whole head - 1  
 Split sections [500 grammes]  
 Florets [500 grammes]

### 3.2.4 Tolerances for Visual Defects

Based upon examination of the standard sample size as specified in 3.2.3, Visual defects are classified as "minor" or "major" and "serious" and assigned points in

accordance with Table I and Table II. To be acceptable the standard sample size shall not exceed the "Total Allowable Points" for the respective categories, including total, in the Tables.

Table I

Whole

(Standard sample size 1 whole head)

Defect		Defect categories			
		Minor	Major	Serious	Total
Discolouration	Light	1			
	Dark		2		
Damage or blemish	Minor	1		4	
	Major		2		
	Serious			4	
Fibrous	[Major]		[2]		
	[serious]			[4]	
Poorly trimmed					
Not compact.			2		
Total Allowable Points		10	6	4	10
Fragments - maximum tolerance: 10 per cent by weight					

Table II

Splits and Florets

(Standard sample size [500] grammes)

Defect		Defect Categories			
		Minor	Major	Serious	Total
Discolouration	Light	1			
	Dark		2		
Damage or blemish	Minor	1			
	Major		2		
	Serious			4	
Fibrous	[Major]		[2]		
	[Serious]			[4]	
Poorly trimmed		1			
Not compact			2		
Loose stems		1			
Total Allowable Points		25	10	4	25
Fragments - maximum tolerance: 10 per cent by weight					

### 3.3 Definition of "defective" for Quality Factors

Any sample unit taken in accordance with the "Sampling Plans for Prepackaged Foods (AQL-6.5)" (Réf. No. CAC/RM 42-1969) shall be regarded as a "defective" for the respective characteristics as follows:

- (a) when it fails to meet the general requirements given in section 3.2.1;
- (b) when it exceeds the "maximum total points" in any one or more of the defect categories in Table I or Table II, as appropriate for the style given in section 3.2.4; or
- [(c) that exceeds the tolerances for fragments in Table I or Table II given in section 3.2.4.]

### 3.4 Lot Acceptance for Quality Factors

A lot will be considered acceptable with respect to Quality Factors when the number of "defectives" as defined in paragraph 3.3 does not exceed the acceptance number (c) for the appropriate sample size as specified in the Sampling Plans for Prepackaged Foods (Ref. No. CAC/RM 42-1969).

## 4 FOOD ADDITIVES

Citric acid or ascorbic acid as processing aids for use in the blanching or cooling water in accordance with 6MP.

## 5 HYGIENE

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

## 6 LABELLING

In addition to Sections 1, 2, 4 and 6 of the General Standard for the Labelling of Prepackaged Foods (Ref. No. CAC/RS 1-1969), the following specific provisions apply:

### 6.1 The Name of the Food

6.1.1 The name of the food as declared on the label shall include "cauliflower". The words "quick frozen" shall also appear on the label except that the term "frozen" <sup>1/</sup> may be applied in countries where this term is customarily used for describing the product processed in accordance with section 2.2 of the standard.

<sup>1</sup> "Frozen": This term is used as an alternative to "quick frozen" in some English speaking countries.

6.1.2 In addition, there shall appear on the label, in conjunction with, or in close proximity to, the word "cauliflower" the style, as appropriate: "whole", "split", "clusters", or optionally "florets" if the product complies with the size specification of 2.4.3. If the product complies with the style "florets" it may be optionally labelled "clusters"<sup>1</sup>

<sup>1</sup> In the opinion of the secretariat this section should be reconsidered in view of the changes made to section 2.4

6.1.3 If the product is produced in accordance with sub-section 2.4.2 the label shall contain in close proximity to the word cauliflower such additional words or phrases that will avoid misleading or confusing the consumer.

## 6.2 List of Ingredients

A complete list of ingredients shall be declared in descending order or proportion in accordance with section 3.2 (c) of the General Standard for the Labelling of Prepackaged Foods (1969).

## 6.3 Net Contents

The net contents shall be declared by weight in either the metric System ("Système international" units) or avoirdupois or both Systems of measurement as required by the country in which the food is sold.

## 6.4 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the food shall be declared.

## 6.5 Country of Origin

The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

## 6.6 Lot Identification

Each container shall be embossed or otherwise permanently marked, in code or in clear, to identify the producing factory and the lot.

## 6.7 Additional Requirements

The packages shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use, as well as directions for cooking.

## 6.8 Bulk Packs

In the case of quick frozen cauliflower in bulk, the information required in 6.1 to 6.6 shall either be placed on the container or be given in accompanying documents, except that the name of the food accompanied by the words "quick frozen" (the term "frozen" may be used in accordance with subsection 6.1.1 of this standard) and the name and address of the manufacturer or packer shall appear on the container.

## 7 PACKAGING

Packaging used for quick frozen cauliflower shall:

- (a) Protect the organoleptic and quality characteristics of the product;
- (b) Protect the product from micro-biological and other contamination;
- (c) Protect the product from dehydration and, where appropriate, leakage as far as technologically practicable; and
- (d) -Not pass on to the product any odour, taste, colour or other foreign characteristics, throughout the processing (where applicable) and distribution of the product up to- the time of final sale.

## 8 METHODS OF EXAMINATION, ANALYSIS AND SAMPLING

### 8.1 Sampling

Sampling shall be carried out in accordance with the Sampling Plans for Prepackaged Foods (AQL-6.5) (Ref. No. CAC/RM 42-1969).

## 8.2 Thawing Procedure

According to the FAO/WHO Codex Alimentarius Method; FAO/WHO Codex Alimentarius Standard Procedure for Thawing of Quick Frozen Fruits and Vegetables (Ref. No. CAC/RM-32-1970).

## 8.3 Cooking Procedure

According to the FAO/WHO Codex Alimentarius Method: FAO/WHO Codex Alimentarius Standard Procedure for Cooking of Quick Frozen Vegetables (Ref. No. CAC/RM 33-1970).

Cooking time for quick frozen cauliflower varies according to the style and variety characteristics. The following figures should be considered as a guideline:

Whole and Split	10-20 minutes
Florets	3-8 "

## 8.4 Determination of Net Weight

According to the FAO/WHO codex Alimentarius Method CAC/RM 34-1970: Net Weight Determination of Frozen Fruits and Vegetables (Recommended international Standard for Quick Frozen Peas, Section 8.3, CAC/RS 41-1970).

## APPENDIX III

### PROPOSED DRAFT STANDARD FOR QUICK FROZEN BROCCOLI

(Advanced to Step 5 of the Procedure)

#### 1 SCOPE

This standard shall apply to quick frozen broccoli of the species Brassica oleracea L. var. italica Plenck (Sprouting Broccoli), as defined below and offered for direct consumption without further processing, except for repacking, if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes.

#### 2 DESCRIPTION

##### 2.1 Product Definition

Quick frozen broccoli is the product prepared from the fresh, clean, Sound stalks or shoots of the broccoli plant which have been sorted, cut, trimmed, washed, sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles, properly drained, and which conform to the characteristics of the species Brassica oleracea L. var. italica Plenck (Sprouting Broccoli).

##### 2.2 Process Definition

Quick frozen broccoli is the product subjected to a freezing process in appropriate equipment and complying with the conditions laid down hereafter. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached -18°C (0 F) at the thermal centre after thermal stabilization. The product shall be maintained at a low temperature such as will maintain the quality during transportation, storage and distribution up to and including the time of final sale.

The recognized practice of repacking quick frozen products under controlled conditions is permitted.

### 2.3 Handling Practice

The product shall be handled under conditions such as will maintain the quality during transportation, storage and distribution up to and including the time of final sale. It is recommended that during storage, transportation, distribution and retail, the product be handled in accordance with the provisions in the Code of Practice for the Processing and Handling of Quick Frozen Foods.

### 2.4 Presentation

#### 2.4.1 Styles

(a) Spears - the head and adjoining portion of the stem ranging in length from more than 7 cm to 16 cm. The spears or stalks may be split longitudinally. Within each sample unit not more than 20 per cent fall outside the designated length.

(b) Florets - the head and adjoining portion of the stem ranging in length from cm to 7 cm with sufficient attached stem to maintain a compact head. Within each sample unit not more than 20 per cent fall outside the designated length.

(c) Cut spears - random length pieces of the broccoli plant, containing both head and stalk material and may be irregular in shape. Pieces from 1 cm to 5 cm in the longest dimension. Leaf material may be present but shall not exceed 25 per cent m/m of the total product, and the head material shall not be less than 25 per cent m/m of the total product. No single sample unit contains less than 15 per cent m/m of the head material or more than 35 per cent m/m of leaf material.

(d) Chopped - Broccoli finely cut into pieces less than 1 cm in the longest dimension. Leaf material may be present but shall not exceed 25 per cent m/m of the total product, and the head material shall not be less than 25 per cent m/m of the total product. No single sample unit contains less than 15 per cent m/m of head material or more than 35 per cent m/m of leaf material.

#### 2.4.2 Other Styles

Any other presentation of the product shall be permitted provided that it:

- (a) is sufficiently distinctive from other forms of presentation laid down in this standard;
- (b) meets all other requirements of this standard;
- (c) is adequately described on the label to avoid confusing or misleading the consumer.

## 3 ESSENTIAL COMPOSITION AND QUALITY FACTORS

### 3.1 Optional ingredients

Salt (Sodium chloride)

Condiments such as spices and herbs

### 3.2 Quality factors

#### 3.2.1 General requirements

Quick frozen broccoli shall be:

- of reasonably uniform characteristic colour, taking into consideration any added optional ingredients;

- free from foreign flavour and odour;
  - clean, free from sand, grit, and other foreign material;
- and with respect to visual or other defects with a tolerance shall be:
- reasonably free from an excessive amount of leaf material particularly large, coarse leaves;
  - practically free from detached fragments and loose leaves (only for spears and florets);
  - practically free from extraneous vegetable material;
  - reasonably free from yellow or brown coloured florets;
  - reasonably free from damage due to mechanical, pathological, or insect injury;
  - reasonably free from poorly trimmed units (spears and florets);
  - practically free from flowered or poorly developed units;
  - practically free from fibrous or woody units;

### 3.2.2 Definitions of Visual Defects

- (a) Extraneous vegetable material (EVM) means leaves, stems, or similar harmless vegetable material other than from the broccoli plant. Each piece = 1 defect;
- (b) Detached leaves (for spears and florets), means broccoli leaves not attached to a unit. Each combined area up to 1 cm = 1 defect.
- (c) Fragments (for spears and florets), means pieces other than leaves weighing less than 5 grammes.

Each combined weight up to 5 grammes = 1 defect.

- (d) Damage means a unit of product affected by mechanical damage, yellow or brown discolouration, insect or pathological damage:

Minor - not affecting the appearance or eating quality.

Each combined area up to 8 cm<sup>2</sup> = 1 defect.

Major - affecting the appearance or eating quality

Each combined area up to 4 cm<sup>2</sup> = 1 defect.

Serious - seriously affecting the appearance and objectionally affecting the eating quality to such an extent that it would be customarily discarded under normal culinacy preparation. Each combined area up to 2 cm = 1 defect.

- (e) Poorly trimmed (for spears and florets) means attached leaves, pieces of leaves, or ragged or partial removal of leaves or small side shoots, or poor cutting of the stem seriously affecting the appearance of the unit; each spear or floret = 1 defect.

- (f) Poorly developed means individual buds are in the flowered stage or are more than moderately enlarged without flowering; and with respect to spears and florets branching bud clusters which comprise the head are spread so as to seriously affect the appearance of the unit, or the bud clusters are of such advanced maturity that individual buds and supporting stems form loosely structured clusters. Each spear or floret = 1 defect. Each 5 grammes of cut spears = 1 defect; each 2 grammes of chopped broccoli = 1 defect.

- (g) Fibrous means tough fibre that is normally developed near the outside portion of the broccoli stem; such units are tough but still edible. Each 5 grammes of cut spears = 1 defect; each 2 grammes of chopped broccoli - 1 defect.
- (h) Woody means tough fibre that is normally developed near the outside portion of the broccoli stem, such units are extremely tough and highly objectionable. Each 2 grammes of chopped broccoli = 1 defect; each 5 grammes of cut spears = 1 defect.

3.2.3 Standard Sample Size

- Spears, florets - 25 units
- Cut spears - 300 grammes
- Chopped - 100 grammes

3.2.4 Tolerances for Visual Defects

Based on the standard sample sizes specified in 3.2.3, visual defects are classified as "minor" or "major" and "serious" and assigned points in accordance with Table I. To be acceptable the Standard sample size shall not exceed the "Total Allowable Points" for the respective categories, including total, in the table.

**TABLE I**  
**All Styles**

(Standard Sample size - see Section 3.2.3)

	DEFECT CATEGORIES			Total
	Minor	Major	Serious	
EVM	1			
Damage				
Minor	1			
Major		2		
Serious			4	
Poorly trimmed	1			
Detached leaves (spears and florets)	1			
Fragments (spears and florets)	1			
Poorly developed		2		
Fibrous		2		
Woody			4	
<b>TOTAL ALLOWABLE POINTS</b>	<b>20</b>	<b>10</b>	<b>4</b>	<b>20</b>

3.3 Definition of "Defectives"

Any sample unit from a sample taken in accordance with the Sampling plans for Prepackaged Foods (AQL-6.5) (Réf. No. CAC/EM 42-1969) shall be regarded as "defective" for the respective characteristics as follows:

- (a) it fails to meet any of the general requirements of paragraph 3.2.1;
- (b) it exceeds the "maximum total points" in any one or more of the respective defect categories as appropriate for the style (3.2.4);
- (c) it exceeds the leaf or head material allowance for "Cut spears" or "Chopped styles" (2.4.1); or
- (d) it-fails to meet the length requirements of 2.4.1.

### 3.4 Lot acceptance for quality criteria

A lot is considered in compliance with the requirements of the standard when the number of "defectives" as defined in 3.3 does not exceed the acceptance number (c) of the appropriate sample size as specified in the Sampling Plans for Prepackaged Foods.

In applying the foregoing acceptance criteria defect (d) of 3.3 is treated independently of the other defectives (a) through (c).

### 4. FOOD ADDITIVES

None permitted.

### 5. HYGIENE

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

### 6. LABELLING

In addition to Sections 1,2,4 and 6 of the General Standard for the Labelling of Prepackaged Foods (Ref. No. CAC/RS 1-1969) the following provisions apply:

#### 6.1 The name of the Food

6.1.1 The name of the food as declared on the label shall include "broccoli"<sup>1</sup>. The words "quick frozen" shall also appear on the label, except that the term "frozen" <sup>1</sup> may be applied in countries where this term is customarily used for describing the product processed in accordance with sub-section 2.2 of the standard.

6.1.2 In addition, there shall appear on the label in conjunction with, or in close proximity to the word "broccoli" the style, as appropriate: "Spears (or Shoots)", "Short Spears", "Pieces", "Chopped".

6.1.3 If the product is produced in accordance with sub-section 2.4.2 the label shall contain in close proximity to the word "Broccoli" such additional words or phrases that will avoid misleading or confusing the consumer.

#### 6.2 List of Ingredients

A complete list of ingredients shall be declared in descending order of proportion in accordance with sub-section 3.2(c) of the General Standard for the Labelling of Prepackaged Foods (1969).

#### 6.3 Net Contents

The net contents shall be declared by weight in either the metric System ("Système International" units) or avoirdupois or both Systems of measurement as required by the country in which the food is sold.

#### 6.4 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the food shall be declared.

#### 6.5 Country of Origin

The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

## 6.6 Lot Identification

Each container shall be embossed or otherwise permanently marked, in code or in clear, to identify the producing factory and the lot.

## 6.7 Additional requirements

The packages shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use, as well as directions for cooking.

## 6.8 Bulk Packs

In the case of quick frozen broccoli in bulk the information required in 6.1 to 6.5 must either be placed on the container or be given in accompanying documents, except that the name of the food accompanied by the words "quick frozen" (the term "frozen" may be used in accordance with sub-section 6.1.1 of this standard) and the name and address of the manufacturer or packer must appear on the container.

<sup>1</sup> "Frozen": This term is used as an alternative to "quick frozen" in some English speaking countries.

## 7. PACKAGING

Packaging used for quick frozen broccoli shall:

- (a) protect the organoleptic and quality characteristics of the product;
- (b) protect the product from micro-biological and other contamination;
- (c) protect the product from dehydration and, where appropriate, leakage as far as technologically practicable; and
- (d) not pass on to the product any odour, taste, colour or other foreign characteristics, through the processing (where applicable) and distribution of the product up to the time of final sale.

## 8. METHODS OF EXAMINATION, ANALYSIS AND SAMPLING

### 8.1 Sampling

Sampling shall be carried out in accordance with the Sampling Plans for Prepackaged Foods (AQL-6.5) (Ref. No. CAC/RM 42-1969).

### 8.2 Thawing Procedure

According to the FAO/WHO Codex Alimentarius Method; FAO/WHO Codex Alimentarius Standard Procedure for Thawing of Quick Frozen Fruits and Vegetables (Ref. No. CAC/RM 32-1970).

### 8.3 Cooking Procedure

According to the FAO/WHO Codex Alimentarius Method: FAO/WHO Codex Alimentarius Standard Procedure for Cooking of Quick Frozen Vegetables (Ref. No. CAC/RM 33-1970).

The cooking time for quick frozen broccoli varies according to the style and variety characteristics. The following figures should be considered as a guideline;

Spears	8	-	12 minutes
Florets and Cut Spears	5	-	8 minutes
Chopped	3	-	5 minutes

#### 8.4 Determination of Net Weight

According to the FAO/WHO Codex Alimentarius Method CAC/RM 34-1970: Net Weight Determination of Frozen Fruits and Vegetables (Recommended International Standard for Quick Frozen Peas, Section 8.3, CAC/RS 41-1970).

## APPENDIX IV

### PROPOSED DRAFT STANDARD FOR QUICK FROZEN LEEK (Advanced to Step 5 of the Procedure)

#### 1. SCOPE

This standard shall apply to quick frozen leek of the species Allium porruy L. as defined below and offered for direct consumption without further processing, except for sizing or repacking, if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes.

#### 2. DESCRIPTION

##### 2.1 Product Definition

Quick frozen leek is the product prepared from fresh, clean, Sound edible parts of the leek plant conforming to the characteristics of the species Allium porrum L., and which have been trimmed, washed, possibly blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

##### 2.2 Process Definition

Quick frozen leek is the product subjected to a freezing process in appropriate equipment and complying with the conditions laid down hereafter. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product has reached -18 C (O F) at the thermal centre after thermal stabilization. The recognized practice of repacking quick frozen products under controlled conditions is permitted.

##### 2.3 Handling Practice

The product shall be handled under such conditions as will maintain the quality during transportation, storage and distribution up to and including the time of final sale. It is recommended that during storage, transportation, distribution and retail, the product be handled in accordance with the provisions in the Code of Practice for the Processing and Handling of Quick Frozen Foods.

##### 2.4 Presentation

###### 2.4.1 Styles

- (a) Whole leek - the intact leek plant with roots and non-tender leaves removed.
- (b) Leek - parts of the whole leek with a length, corresponding to longest dimension of the package, but not less than [7] cm.
- (c) Cut leek - parts of the whole leek, cut perpendicularly to the longitudinal axis, minimum length [20] mm, maximum length [6]/cm.
- (d) Leek rings - parts of the whole leek cut perpendicularly to the longitudinal axis into slices, not thinner than [10] mm and not thicker than [20] mm.
- (e) Chopped leek - the whole leek chopped into pieces, such that the original structure is almost entirely lost, resulting in a "unit" generally smaller than [10] mm in width.

###### 2.4.2 Other styles

Any other presentation of the product shall be permitted provided that it:

- (a) is sufficiently distinctive from other form of presentation laid down in this standard;
- (b) meets all other requirements of this standard;
- (c) is adequately described on the label to avoid confusing or misleading the consumer.

#### 2.4.3 Colour

- (a) Leek may be presented as white.
- (b) If leek is presented as "white", not more than 10% m/m shall be present, of leaves or parts of leaves with a green colour.

#### 2.4.4 Sizing

- (a) [Whole leek, leek, cut leek and leek rings may be presented as sized or unsized.]
- (b) The minimum diameter of whole leeks, measured to the axis immediately above the swelling at the neck shall be not less than 10 mm.
- (c) When sized, the difference between the largest and smallest leek in the same package, measured perpendicular to the axis immediately above the swelling at the neck, shall be not more than 10 mm.

### 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

#### 3.1 Optional Ingredients

Salt (sodium chloride)  
Condiments, such as spices and herbs

#### 3.2 Quality Factors

##### 3.2.1 General Requirements

Quick frozen leeks shall:

- have good colour characteristics;
- be clean, sound, and practically free from foreign material;
- be free from foreign flavour and odour, taking into consideration added optional ingredients;
- have similar varietal characteristics;
- be free from objectionable tough parts;

and with respect to visual or other defects subject to a tolerance, shall be:

- practically free from sand and grit;
- free from yellow and/or yellowish leaves;
- reasonably free from damage such as staining, discoloration, or insect injury;
- reasonably free from extraneous vegetable material;
- practically free from roots;
- reasonably well trimmed;
- practically free from loose or detached leaves in Whole Style only.

##### 3.2.2 Analytical Characteristics

Mineral impurities - not more than 0.1% m/m measured on a whole product basis.

##### 3.2.3 Definition of Visual Defects

- (a) Discoloration - discoloration of any kind on the product and which materially detracts from the appearance of the product
  - Minor -discoloration which is light in colour. Each area -or combined area of 4 cm<sup>2</sup> = 1 defect;
  - Major - discoloration which is dark in colour. Each area or combined area of 4 cm =1 defect.
- (b) Damaged -each leaf or part of leaf that is affected by blemishes, staining or insect injury
- (c) Extraneous Vegetable Material (EVM) -each cm<sup>2</sup> harmless vegetable material other than from the leek;
- (d) Roots - each disk of roots attached to the leek or loose
- (e) (Parts of roots - parts of roots attached to the leek or loose;
- (f) Poorly trimmed- - [*the white* portion is less than half of the total product ;]  
- for the presentation "white" (2.4.3) not more than 10% m/m of green leaves is permitted;
- (g) Loose Leaves - leaf or part of it which is detached from the shaft.)  
Whole Style only

### 3.2.4 Standard Sample Size

The standard sample size for segregating and evaluating visual defects shall be as follows:

<u>Style</u>	<u>Standard Sample Size</u>
Whole leek	[500 g but not less than two piece]
Leek and Cut leek	[500] g
Leek rings	[300] g
Chopped leek	[300] g

### 3.2.5 Method of Examination

For separation and enumeration of visual defects the standard sample is placed in deep water in a deep tray, and the shafts or leaf portions separated one by one.

### 3.2.6 Tolerances for Visual Defects

Based on the standard sample sizes indicated in 3.2.4, visual defects shall be assigned points in accordance with the following Tables. The maximum number of defects permitted is the Total Point Allowance rating indicated for the respective defect categories in the Tables I and II.

**TABLE I**  
**Whole Leek**  
Standard Sample Size [500 grammes but not less than two pieces]

Defect	Defect Categories		
	Minor	Major	Total
Discoloration -Minor Major	1	2 2	
Damaged EVM	1		
Roots		2	
Parts of roots	1		
Poorly trimmed		2	
Loose leaves	1		
Total Allowable Points	8	6	10

**TABLE II**  
Leek, Cut Leek, Leek Rings and Chopped Leek  
Standard Sample Size [500] grammes (Leek and Cut Leek)  
Standard Sample Size [300] grammes (Leek Rings & Chopped Leek)

Defect	Defect Categories		
	Minor	Major	Total
Discoloration - Minor Major	2	2	
Damaged		2	
EVM	1		
Roots		2	
Parts of roots	1		
Poorly trimmed		2	
Total Allowable Points	5	6	6

### 3.2.7 Tolerances for Sizing

If size graded, the product shall contain not less than 80% by number of whole leek, leek, cut leek, leek rings of the declared size.

### 3.3 Definition of "Defective"

Any sample unit taken in accordance with the Sampling Plans for Prepackaged Foods (AQL-6.5) Ref. No. CAC/RM 42-1969), and which is adjusted to a standard sample size for applying the tolerances relating to "Visual Defects" shall be regarded as "defective" for the respective characteristics, as follows:

- (a) any sample unit that fails to meet the general requirements of paragraph 3.2.1:<sup>1</sup>
- (b) any sample unit that fails to meet the analytical requirements of paragraph 3.2.2;
- (c) any sample unit that fails the Total Point Allowance for defect categories Minor or Major; or which fails the Total Point Allowance for the combined Total of the respective defects (see section 3.2.6);
- (d) any sample unit that fails to comply with the sizing requirements of paragraph 3.2.7.

<sup>1/</sup> This sub-paragraph (for instance flavour and odour) has not been introduced in the standards for raspberries, spinach, peaches, bilberries; possibly it has been forgotten.

#### 3.4 Lot Acceptance for Quality Criteria

A lot is considered acceptable when the number of "defectives" as defined in paragraph 3.3 does not exceed the acceptance number (c) for the appropriate sample size as specified in the Sampling Plans for Prepackaged Foods. In applying the acceptance procedure each "defective" (sub-paragraphs (a), (b), (c) or (d) of section 3.3 is treated individually for the respective characteristics.

#### 4. FOOD ADDITIVES

None permitted.

#### 5. HYGIENE

It is recommended that the product covered by the provisions of this standard is prepared in accordance with the General Principles of Food Hygiene (Ref. No. CAC/RCP 1-1969; recommended by the Codex Alimentarius Commission).

#### 6. LABELLING

In addition to sections 1, 2, 4 and 6 of the General Standard for the Labelling of Prepackaged Foods (Ref. No. CAC/RS 1-1969), the following provisions apply:

##### 6.1 The Name of the Food

6.1.1 The name of the food as declared on the label shall include the designation "leek".

6.1.2 In addition, there shall appear on the label in conjunction with or in close proximity to the word "leek":

- (a) the style as appropriate: "whole", "leek", "cut leek", "rings" or "chopped";<sup>1</sup>
- (b) when presented as white, the word: "white".

6.1.3 If the product is produced in accordance with sub-section 2.4.2 the label shall contain in close proximity to the word leek such additional words or phrases that will avoid misleading or confusing the consumer.

6.1.4 The words "quick frozen"<sup>2</sup> shall also appear on the label, except that the term "frozen" may be applied in countries where this term is customarily used for describing the product processed in accordance with the section 2.2 of the standard.

##### 6.2 Size Designation

If a term designating the size of whole leek is used, it shall:

- (a) be supported by a statement of the predominant range of the maximum diameter of the leek in millimeters, or fractions of an inch in those countries where the English System is in general use; and/or
- (b) conform to the customary method of declaring size in the country in which the product is sold.

##### 6.3 List of Ingredients

A complete list of ingredients shall be declared, in descending order of proportion in accordance with section 3.2(c) of the General Standard for the Labelling of Prepackaged Foods (CAC/RS 1-1969).

#### 6.4 Net Contents

The net contents shall be declared by weight in either the metric system ("Système International" units) or avoirdupois or both Systems of measurement as required by the country in which the food is sold.

#### 6.5 Name and Address

The name and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared.

#### 6.6 Country of Origin

The country of origin of the product shall be declared if its omission would mislead or deceive the consumer.

<sup>1</sup> Note by the Secretariat: this section requires editorial revision.

<sup>2</sup> "Frozen": This term is used as an alternative to "quick frozen" in some English speaking countries.

#### 6.7 Lot Identification

Each container shall be embossed or otherwise permanently marked, in code or in clear, to identify the producing factory and the lot.

#### 6.8 Additional Requirements

The packages shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use, as well as directions for cooking.

#### 6.9 Bulk Packs

In the case of quick frozen leek in bulk, the information required in 6.1 to 6.7 must either be placed on the container or be given in accompanying documents, except that the name of the food accompanied by the words "quick frozen" (the terra "frozen" may be used in accordance with section 6.1.4 of this standard) and the name and address of the manufacturer or packer must appear on the container.

### 7 PACKAGING

Packaging used for quick frozen leek shall:

- (a) protect the organoleptic and other quality characteristics of the product;
- (b) protect the product against microbiological and other contamination;
- (c) protect the product from dehydration, and where appropriate, leakage as far as technologically practicable;
- (d) not pass on to the product any odour, taste, colour or other foreign characteristics throughout the processing (where applicable) and distribution of the product up to the time of final sale.

### 8 METHODS OF EXAMINATION, ANALYSIS AND SAMPLING

#### 8.1 Sampling

Sampling shall be carried out in accordance with the Sampling Plans for Pre-packaged Foods (AQL-6.5) (Réf. No. CAC/KM 42-1969).

#### 8.2 Thawing Procedure

According to the FAO/WHO Codex Alimentarius Standard Procedure for Thawing of Quick Frozen Fruits and Vegetables (Ref. No. CAC/RM 32-1970).

### 8.3 Détermination of Net Weight

According to the FAO/WHO Codex Alimentarius Method CAC/KM 34-1970: Net Weight Determination of Frozen Fruits and Vegetables (Recommended International Standard for Quick Frozen Peas, Section 8.3, CAC/RS 41-1970).

#### APPENDIX V

### REPORT OF THE WORKING GROUP ON THE SURVEY OF FROZEN FOOD TEMPERATURES

#### (A) DURING LOCAL DISTRIBUTION AND (B) IN RETAIL CABINETS

#### BACKGROUND

1. At the 8th Session of the Joint ECE/Codex Group of Experts on Quick Frozen Foods held in Geneva from 30 April to 4 May 1973 it was agreed that the United Kingdom should convene a drafting group to formulate recommendations for dealing with problems met when attempting to recommend the optimum temperature at which quick frozen foods should be held during local distribution and in retail cabinets; the drafting group to consist of representatives from France, the Federal Republic of Germany, Denmark, Netherlands, Switzerland, Norway, the United States and the United Kingdom.

#### THE 1974 REPORT

2. During the 9th Session of the Group of Experts, held in Geneva from 7-11 October 1974, the working group met to consider the information supplied in response to two questionnaires (CX/QFF 74/3-5) issued after the 8th Session. Information had been supplied in the form requested by only six countries, although some information was provided by five further countries. This data showed that a considerable proportion of the samples, both at final delivery and in retail cabinets, were warmer than  $-18^{\circ}\text{C}$ . Despite the possible deficiencies and the incompleteness of the data, the working group considered that there were sufficient indications to justify making recommendations to the Group of Experts (Appendix VI to ALINORM 76/25).

3. In brief, these recommendations were to the effect that it would be unrealistic to require frozen food to be maintained at  $-18^{\circ}\text{C}$ , either in local distribution or in retail cabinets. The working group considered that the Code should reflect the realities of the present, while representing a target or objective for the future. On this basis the working group recommended a small amendment to Section v, and no change to Section VI. The report was accepted by the Group of Experts.

#### FURTHER WORK

4. The Group of Experts agreed (paragraph 96 of ALINORM 76/25) that there was a need for further investigations, and instructed the working group to seek further data, to assess the possibility of technical improvements, and to advise whether or not there was a need to change the existing provisions of the draft Code of Practice. (it was also agreed that Australia would participate in this further work). To this end CL 1974/58 was issued in December 1974 asking for further contributions to the 1974 Survey, and for additional background information as outlined in CX/QFF 75/2. As the response to these requests was limited, a further request for the same information was issued in March 1975 (CL 1975/11).

## RESPONSE TO THE 1975 SURVEY

5. The following countries have submitted further information since the last meeting of the working group:

(a) **LOCAL DELIVERY.** Five countries -Australia (a summer survey, supplementing the winter survey submitted last year), Denmark, Federal Republic of Germany, the Netherlands and Romania - have provided statistical information in the form requested. These surveys relate to a total of 144 delivery trips, compared with the 241 delivery trips covered by the 1974 Survey. In addition, Japan has supplied some general information on local delivery temperatures, although not in the form requested.

(b) **RETAIL CABINETS.** Three countries - Denmark, Japan and the Netherlands – have submitted further information on temperatures in retail cabinets. This information is not directly comparable in form with the data supplied last year.

(c) **OTHER INFORMATION.** Eight countries - Austria, Australia, Czechoslovakia, Denmark, Japan, the Netherlands, Switzerland and the United Kingdom - have supplied additional information on various aspects of frozen food storage and distribution. The extent to which the aspects detailed in CX/QFF 75/2 is covered varies.

## RECOMMENDATIONS

6. It is disappointing that so few countries have cooperated in this survey. The information supplied by these countries has, however, been extremely useful to the Working Group in formulating its recommendations on the three aspects of its remit which are as follows.

(a) Further data

The additional data supplied does not add significantly to, or differ materially from, that available from the previous survey. In these circumstances the working group considers that no useful purpose would be served by asking yet again for cooperation in supplying information.

(b) Possibility of technical improvements

The data currently available is not sufficient to serve as a basis for any detailed assessment of the possibility of technical improvements at this time. There are, however, indications of where progress might be made, although the consideration of such improvements is outside the terms of reference of the working group. In general terms sufficiently precise correlations cannot be established between the various factors involved. In such an expanding sector of the food market as quick frozen products, however, it is to be expected that technical improvements will occur, as they have done over recent years, although the cost and availability of the equipment must necessarily limit the pace of such improvements.

(c) Need for amendment to the draft code of practice

The working group considers that the nature of the additional data available is not of itself such to call in question the previous recommendations of the working group as reported in Appendix VI to ALINORM 76/25,

Nevertheless the working group considered yet again the implications of all the data submitted and came to the conclusion that the Group of Experts should be, recommended to make the following amendments to the draft Code of Practice for the Processing and Handling of Quick Frozen Foods (Appendix VII, ALINORM 76/25):

- (a) Para. 1.3 - Amend to read: "The provisions of this Code of Practice should be interpreted as recommendations, and are intended as a guide . . . .".
- (b) Para. 5.6 - Add at end of para.: "and should not in any case rise above -12°C (- (-10.4°F] in the warmest pack". Footnote to be deleted.
- (c) Para 5.7 - Amend to read: "to be reduced to -18°C where possible and as soon as possible . . . .".
- (d) Para 6.3 - Amend second and third lines to read: ". . . temperature of the warmest pack should not be allowed to become higher than -12°C". Delete the last part of the sentence from and including the word "except". Footnote to be deleted.

METHOD FOR CHECKING TEMPERATURE OF QUICK-FROZEN FOODS  
(Advanced to Step 5 of the Procedure)

1. SCOPE

The procedures outlined herein provide methods for the measurement of temperatures of quick-frozen foods. Temperature measurement involves two aspects:

- (a) to obtain an accurate temperature at point of measurement, using proper equipment; and
- (b) to select a representative number of locations for measurement to provide information regarding average temperature of the lot as well as variations within the lot.

Two methods are recommended for temperature measurement, namely for  
Measuring product temperature - Referee Method, and  
Measuring surface temperature - Routine Method

2. DEFINITION OF TEMPERATURE

"Temperature" for the purpose of this document is the temperature measured at the point of placement of the sensitive part of the temperature measuring instrument or device.

3. GENERAL SPECIFICATIONS FOR TEMPERATURE MEASURING INSTRUMENTS

Only equipment that meets the following requirements should be used for measuring and control purposes:

- (a) The half-value period should not exceed 0.5 minutes;
- (b) The instrument should be accurate to within  $\pm 0.5^{\circ}\text{C}$  over the range  $-30^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$ ;
- (c) The instrument should be sensitive to changes of  $0.5^{\circ}\text{C}$ ;
- (d) The accuracy of the measurement should not be affected by the temperature of the surroundings;
- (e) Markings on the scale should be in divisions of  $1^{\circ}\text{C}$  or less and readable to  $0.5^{\circ}\text{C}$ ;
- (f) For measuring equipment, other than glass-stem thermometers, a setting device to allow adjustment of the indicating needle during recalibration should be provided;
- (g) The sensitive part of the measuring device should be so constructed as to ensure good thermal contact with the product;
- (h) Electrical equipment should be protected from undesirable influences resulting from condensation of moisture.

4. EQUIPMENT FOR MEASURING TEMPERATURE

4.1 Glass Stem Thermometer

Glass stem thermometers are not recommended for routine testing, but where used they should be used with great care in proximity of food. The glass stem thermometer should have the following characteristics:

- (a) An overall length of about 25 cm.
- (b) A sharp pointed round stem for product measurement and an elliptical stem for surface measurement.
- (c) A pocket carrying case to protect the thermometer.

(d) Alcohol filling is preferred to mercury.

#### 4.2 Dial Thermometer

Equipment may be based on the principle of liquid expansion, vapour pressure change, spring deformation, or metal expansion. The dial thermometer should have the following characteristics:

- (a) An overall length of the sensitive part of about 15 cm.
- (b) A sharp pointed stainless steel stem for product measurement and preferably a flat stem (not over 5 mm thick) for surface measurement.
- (c) A pocket carrying case to protect the thermometer.
- (d) A dial, hermetically sealed with plastic and not with glass.

#### 4.3 Electrical Thermometer

Electrical resistance or thermocouple as the sensing element. The overall length of the probe or blade should be about 15 cm. The sensing element of the electrical thermometer should have the following characteristics:

- (a) A stainless steel sensitive part - either probe or blade type,
- (b) Leads of known resistance or, preferably, leads with built-in compensation resistance.

#### 4.4 Instruments for Making Holes in the Product

A sharp pointed metal instrument such as an ice pick or hand drill, which can easily be cleaned, should be used. The hole in the packet and product should be only marginally larger in diameter than the sensitive part of the sensing element to be used.

### 5. CALIBRATION OF THERMOMETERS

5.1 Thermometers should be checked at regular intervals depending on how consistent they are for accuracy. Instruments handled from one load to another should be checked weekly. Instruments used during transport should be checked before a new load is to be carried.

5.2 The test can be made by immersing the thermometer sensing element in an ice water bath. A litre container (vacuum flask) should be filled with chipped ice and then filled entirely with cold water. It should be stirred for at least two minutes, before the sensing element is inserted into the centre of the mixture. The sensing element should not be allowed to touch the container. The temperature indicated by the thermometer should be observed after pausing for at least three minutes to allow stabilization to take place. The immersed thermometer should read within  $0.5^{\circ}\text{C}$ , plus or minus, of  $0^{\circ}\text{C}$ . The  $0^{\circ}\text{C}$  point on the scale should emerge just above the top of the flask. The sensing element of all other types should be entirely immersed in the ice bath.

5.3 For checking the thermometer at temperatures in the range of  $-18^{\circ}\text{C}$  to  $-21^{\circ}\text{C}$ , a brine mixture consisting of one part by weight of table salt and three parts by weight of chipped ice should be used. The reading of the thermometer being tested should be compared with that of a thermometer known to be accurate. Both temperature sensors should be inserted into the brine mixture with the stems next to each other, and they should not touch the container. The temperatures indicated by the thermometers should be observed after pausing for at least three minutes to allow stabilization to take place.

5.4 Thermometers can also be checked by comparing the reading from the thermometer being tested with a thermometer which is known to be accurate; both are held alongside each other in the same ambient environment and the readings compared.

5.5 If no reference thermometer is available, an eutectic mixture of analytical grade sodium chloride and ice gives a temperature of  $-21.4^{\circ}\text{C}$ .

5.6 If an error greater than  $0.5^{\circ}\text{C}$  ( $1^{\circ}\text{F}$ ) is indicated, the calibration of the thermometer should be corrected by means of its standard adjustment mechanism. After adjustment, the thermometer should be rechecked for accuracy.

5.7 Glass thermometers having an error greater than  $0.5^{\circ}\text{C}$  ( $1^{\circ}\text{F}$ ) should be discarded.

## 6. PROCEDURE FOR MEASURING TEMPERATURE IN THE PRODUCT - (Referee Method)

6.1 Reliable information on the temperature of a product can be obtained only by measuring the temperature in the product.

6.2 The product temperature shall be measured at any point in the product which is 2.5 cm below the surface. In the case of packages with one dimension less than 5 cm, the measurement point should be halfway through this dimension.

6.3 Making a Hole - Sensing elements are in general not structurally designed to penetrate into blocks of frozen food. A hole should be made in the packages concerned using a probe or hand drill which has been previously pre-cooled. The hole should be at least 5 cm deep.

### 6.4 Pre-cooling

(1) A package should be selected at random from the load for use in pre-cooling the probe or hand drill and the sensing element. This will be referred to hereafter as the "pre-cool package." A warm probe, hand drill or sensing element should never be placed in the test package.

(2) The sensing element should be inserted into the centre of the "pre-cool" package and it should be left there for at least three minutes. It should not be removed from the "pre-cool" package until it is ready to be inserted in the test package.

(3) Pre-cooling may also be accomplished by inserting the sensing element between packages of frozen foods, provided good thermal contact can be attained. If readings are being taken in cold storage facilities, pre-cooling can be accomplished by allowing the equipment to equalize with the ambient temperature of the cold stores.

### 6.5 Measuring Temperature of Test Package

For an accurate temperature measurement it is essential that the formation of the hole and subsequent temperature readings in the product with the sensing element are carried out with the product in the refrigerated environment from which it was selected, or in ambient conditions as close as possible to that environment.

(1) The sensing element should be removed from the pre-cool package and immediately inserted into the test package so that the point is approximately 2.5 cm below the surface of the product.

(2) It is preferable to reach this point by inserting the sensing element so that as much of it as is practicable is in the product. (See Figure 1 - Annex I).

(3) In the case of packages less than 5 cm in one dimension, insert the sensing element so it is close to the mid point of the package.

(4) Record the temperature after it has reached a steady value.

(5) Allow the sensing device to remain in the test package, after recording the temperature of that package, until ready to take readings on subsequent packages. This will eliminate the need to again pre-cool the device.

## 7. PROCEDURE FOR MEASURING SURFACE TEMPERATURE OF THE PRODUCT - (Routine Method)

7.1 The surface temperature of a product can be obtained in a non-destructive way and is sufficiently accurate for routine temperature checks, provided good contact is achieved by the sensing device between the packages or cases. A reasonable approximation to the temperature of the product can be obtained by measuring the temperature at the surface of the product.

By applying adequate pressure, the readings are generally within [ $+ 10^{\circ}\text{C}$ ] of the product temperature.

### 7.2 Measuring Surface Temperature

- (1) Pre-cool the sensing device as specified in paragraph 6.4.
- (2) If the product is in shipping cases, cut the sidewall of the case with a sharp knife and bend the cut tab outward.
- (3) Insert the sensing element between the first and second layers of packages so that all of the sensing element is in firm contact with the package walls. See Figure 2 - Annex I).
- (4) Stack additional cases of the frozen product obtained from the same general location on top of the test case in order to ensure good thermal contact with the sensing element.
- (5) Record the temperature after it has reached a steady value.
- (6) If several test cases are being checked, do not remove the sensing instrument from the test case until the succeeding case is ready for testing.
- (7) If the product is not cased, as in a retail cabinet, observe the same steps ((1) through (6)). Stack sufficient packages on top of the test package in order to obtain good thermal contact.

## 8. SAMPLING

### 8.1 Selection of Test Packages

The selection of location from which to take test packages for temperature measurement is difficult to specify precisely and must be a matter of judgement, taking account of any previous history of the load or lot being examined and also the results obtained as the sampling proceeds. The correct interpretation of the results depends to a very large extent, on informed sampling. Test packages should be selected in such a way and in such number that their temperatures will be representative of the stock being examined.

### 8.2 Cold Stores

If cases are stacked closely together, e.g. on a pallet or in a stack, temperature readings should be taken from packages on the outer face of outer cases, and from packages from cases in the centre of the lot. These temperatures are known as "outer temperatures" and "centre temperatures". A significant difference between the two readings will indicate a temperature gradient in the lot and is an indication that more temperature readings should be taken in order to establish more reliable data on the temperature condition of the product.

### 8.3 Vehicles or Transport Container Unit

When unloading, packages should be selected for temperature measurement from the location shown in [Figure3]. These packages normally will give product temperatures representative of the load. Any additional locations judged to be useful may be tested

taking into account the sensitivity of the product to thermal shock, knowledge of the duration of the journey, etc.

8.4 Retail Display Cabinets

In all cases check a package from at least the front top layer, the centre of the cabinet and the bottom portion of the cabinet. If the cabinet is on a defrost cycle it should so be noted on the report.

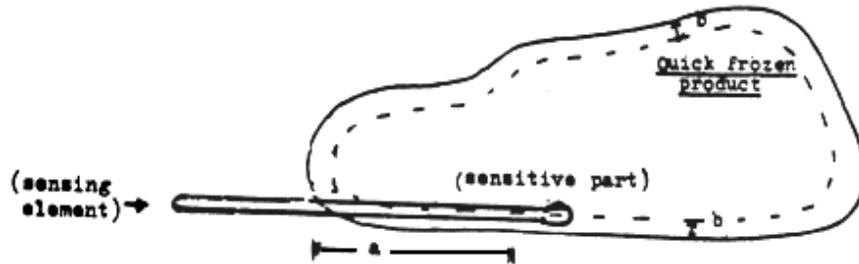
ANNEX I

METHOD FOR CHECKING TEMPERATURE OF QUICK FROZEN FOODS

Figure 1

Diagram to illustrate method of measuring product temperature

a = 2.5 cm or longer  
b = 2.5 cm



Side View, Case of 24 Solid Packed Product

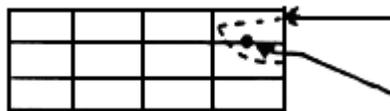
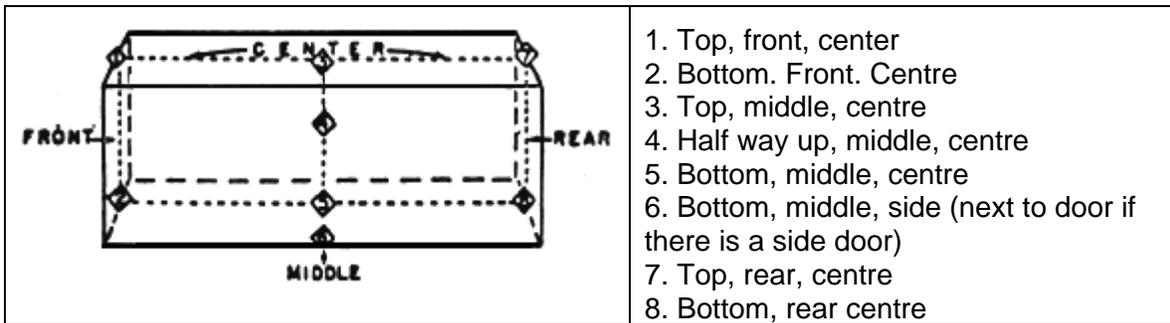


Figure 2

1. Cut case sidewall
2. Band cut tab
3. Insert probe



[ Figure 3 ] – Suggested locations in the car or track from which test packages should be selected