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ALINORM 74/27

JOINT FAO/WHO FOOD STANDARDS PROGRAMME  
CODEX ALIMENTARIUS COMMISSION  
Tenth Session, Rome, 1-12 July 1974

REPORT OF THE CODEX COMMITTEE ON SUGARS  
Sixth Session, London, 19-22 March, 1974

INTRODUCTION

1. The Codex Committee on Sugars held its sixth session in London from 19-22 March 1974, by courtesy of the Government of the United Kingdom. Mr. R.P. Giles, United Kingdom, was in the chair.
2. Mr. J. Moss, Deputy Secretary, Ministry of Agriculture, Fisheries and Food, welcomed the participants on behalf of the United Kingdom authorities. He stressed the importance attached by the United Kingdom to the work of the Codex Alimentarius Commission and welcomed the fact that the session would be devoting part of its time to a review of previous work to ensure that the right results had been achieved.
3. The session was attended by delegates from the following 22 countries:

Australia	Finland	Netherlands
Austria	France	Norway
Brazil	Federal Republic of Germany	Poland
Canada	Hungary	Sweden
Cuba	Ireland	United Kingdom
Denmark	Italy	United States of America
Ecuador	Malaysia	Yugoslavia
El Salvador		

Observers were present from the following international organizations:

European Economic Community  
International Sugar Organization  
International Federation of Glucose Industries  
International Commission for Uniform Methods of Sugar Analysis.

The list of participants is contained in Appendix 1 to this Report.

ADOPTION OF PROVISIONAL AGENDA

4. The Committee adopted the Provisional Agenda (CX/S 74/I) without alteration.

## SUITABILITY OF SAMPLING PLANS FOR PREPACKAGED FOODS (CAC/RM 42-1969)

5. The Committee considered whether the Sampling Plans for Prepackaged Foods would be suitable to be applied to the standards which had been elaborated for various sugars. There was a general view that the sampling plans, which had been based on grading requirements, were not suitable for the purposes of statutory control to ensure that compositional criteria had been met.

6. Apart from doubts about the Acceptable Quality Level (AQL) of 6.5 which was an essential feature of the plans, it was pointed out that there was no experience available to show at what level an AQL should be set. It was further suggested that the basis of examination - physical examination by attributes - was insufficiently precise for sugars and similar foods, which would require account to be taken of the amount of variation from a requirement as well as the type of variation.

7. The Committee noted that ICUMSA were to undertake a study of sampling specifically related to sugars, and to recommend guidelines to be considered by the Sugars Committee before being referred to the Codex Methods of Analysis and Sampling Committee, which was engaged on the development of general guidelines for sampling. The Committee therefore agreed not to take a decision until the outcome of the ICUMSA study was known and the Codex guidelines were available.

## METHODS OF ANALYSIS ARISING FROM PREVIOUS WORK OF THE COMMITTEE

### Water-insoluble Matter In All Standards

8. The Committee noted the views of ICUMSA expressed in paper CX/s 74/3 and the method proposed in CX/s 74/3 Add. 1. Despite the fact that criteria and methods of analysis for water - insoluble matter were important in enabling manufacturers to ensure that their products - particularly solid sugars - were satisfactory, the Committee felt that the question of methods of analysis was a matter for information rather than legislation, particularly since some doubts were expressed as to whether the method had been sufficiently tested to justify inclusion as a Codex reference method.

9. It was pointed out that the standards for sugars contained all the primary criteria yet retained the benefit of simplicity, which enabled acceptance of the standards to be made more easily. The Committee accepted the importance of this aspect and agreed not to include criteria for water-insoluble matter in the standards. ICUMSA was requested to ensure that manufacturers were made aware of the existence of a method of analysis which could be used for their own control measures.

### Turbidity - White Sugar

10. Although the importance of a criterion was recognized, the Committee noted that no method of analysis was yet available. The hope was expressed that further work would enable a method to be elaborated, but it was agreed that until such time, no criterion should be included in the standard.

### Sulphur Dioxide - Substitution of Tanner Modification for Monier Williams Method (CX/S 74/4 and 74/4 Add.1)

11. There was general agreement that in practical terms neither method produced significantly better results at the levels imposed by the standards. Some delegations felt that the Tanner modification was preferable, since its results were more easily reproducible and it was more practical and less time-consuming. In spite of this, the

Committee agreed that until further evidence, based on collaborative studies, showed that one or other was significantly better, no change should be made.

12. It was pointed out that the Methods of Analysis and Sampling Committee had recommended the Tanner modification as a suitable method for the determination of sulphur dioxide in all foods, although this, however, did not conflict with the adoption of a different method for specific foods. It was agreed that the attention of the Methods of Analysis and Sampling Committee should be drawn to the decision taken on sugars, and also to the existence of a method being developed by the International Organization for Standardisation.

#### Powdered Sugar

13. After a brief discussion of the background to paper CX/S 74/7 the Committee agreed that it would be preferable for the compositional criteria to relate to the product as sold rather than to the sugar used to produce the powdered sugar. It was agreed that the Commission should be requested to authorize a Step 9 amendment to enable this to be done. It was however realized that a considerable amount of collaborative work would need to be done before the Committee was in a position to recommend methods of analysis and values for some of the criteria.

14. The Committee briefly considered the proposed draft standard appended to CX/S 74/7. A suggestion to delete the term "pulverised" to allow for the development of alternative methods of production was considered to be unnecessary until such methods were commercially viable. Several other points raised during the discussion were felt to be appropriate for Step 3 comments if the Commission approved an amendment. Several delegations pointed out that they could only agree to starches being approved as anti-caking agents. The main items to emerge were those aspects on which collaborative work would need to be carried out to determine the applicability of figures suggested, or to arrive at figures not at present included. These were: - polarisation; invert sugar content; loss on drying (if it proved necessary); and colour. The latter was regarded as particularly important even though no method was available at present to measure reflectance.

#### Powdered Dextrose

15. The Committee considered document CX/S 74/7 Add. 1 which reported methods of analysis for dextrose.

16. Although there was no objection in principle to criteria based on the product as sold, there were difficulties in this approach. One solution put forward was that only anti-caking agents capable of being separated easily from dextrose should be permitted, thus allowing the criteria in the existing standard to be retained. It was agreed that this suggestion should be pursued, but that the end product approach should not be abandoned. On the latter, however, no delegates had used the suggested ISO methods of analysis on powdered dextrose with anti-caking agents. The Committee therefore agreed that ISO should be encouraged to develop its methods so that collaborative studies could be undertaken. These would be necessary before a Step 9 amendment could be considered by the Committee.

### CONSIDERATION OF FURTHER SUGARS FOR THE ELABORATION OF STANDARDS

(a) Fructose

17. The Committee considered the trade statistics reported in CX/S 74/5 and CX/S 74/5 Add. 1 and other statistics reported verbally. It was pointed out that most existing requirements were based on fructose being regarded as a pharmaceutical product. Recent developments, bringing fructose into use as a food ingredient, had altered the situation. Present world wide production was estimated to be of the order of 30,000 to 40,000 tons per annum. Although fructose was not yet a major item of international trade, it was now used as an ingredient in food and its use was growing. The Committee agreed to the elaboration of a food standard, as distinct from a pharmaceutical standard.

18. The Committee then considered the proposed draft standard annexed to CX/S 74/5. Various amendments were suggested, in particular to the values shown in square brackets in the revised proposed draft which is attached as Appendix 2 to the Report.

19. One point of general application arising from the discussion was the question of lead levels permissible. The Committee was informed that data was at present being collected and that the FAO/WHO Joint Expert Committee on Additives and Contaminants would be reviewing the questions of the daily and weekly intakes (see also paragraph 38).

20. The Committee agreed that the revised proposed draft standard should be sent out for government comments at Step 3 of the Procedure.

(b) Maltose and Malto-dextrins

21. The Committee agreed that Maltose was not produced for food use and that Malto - dextrins were more similar to starches than to sugars. The Committee was reminded that the previous line drawn between glucose syrup and starches had been a dextrose equivalence of 20%. Malto - dextrins would always be below this level. It was agreed that if a standard should be required, it would probably be more appropriate for the prospective Cereals Committee than for the Sugars Committee.

(c) Syrups and Treacle

22. The United Kingdom delegate explained that Treacle was a term used for a type of sugar syrup, of cane origin, used for human consumption. The Committee agreed that as syrups and treacle covered a very wide range and were mainly produced to meet consumer requirements, it was not possible to lay down precise compositional criteria. Also, international trade was insufficient to justify a world-wide Codex standard.

(d) Invert Sugar and Invert Sugar Syrups

23. The Committee agreed that these products depended mainly on consumer requirements and that international trade did not warrant the elaboration of a world-wide Codex standard.

(e) Maple Sugars and Syrup

24. The Canadian delegate said that of his country's exports (about 10 million 1b.) most went to the U.S.A. Canadian Government controls existed and consideration was being given to statutory grading of this product. In these circumstances there seemed to be no need for a Codex standard. This view was supported by the United States delegate who explained that voluntary grading standards existed in the United States. The Committee agreed that, for the time being, no world-wide Codex standard was needed.

REVIEW OF STEP 9 STANDARDS FOR SUGAR

25. The representative of the FAO/WHO Food Standards Programme informed the Committee of the decision taken at the meeting of the Committee on General Principles which would replace Acceptance with Minor Deviations by a formula of Acceptance with Specified Deviations. The new formula would put the onus on individual governments accepting standards to specify all deviations and to declare the conditions under which products conforming to the standards could enter and circulate freely in their territory.

26. He also confirmed that the Government of Canada had adopted an approach under which legislation in their country would precede publication in the Codex Alimentarius. This approach would be likely to assist the Codex acceptance procedure as previously they were awaiting publication in the Codex before proposing legislation in Canada. Similarly, he hoped that the recently adopted EEC directive on certain sugars would enable member states to accept certain of the Codex sugar standards with specified deviations. Both of these would, in his view, provide a stimulus to acceptance of Codex standards by other countries.

27. The EEC representative explained that the recently adopted directive would enable the Community and its member states, to accept five of the sugar standards (white sugar, glucose syrup, dried glucose syrup, dextrose anhydrous and dextrose monohydrate) with minor specified deviations. He emphasized that the directive had been based to a large extent on the Codex standards already elaborated. The United States delegate said that four of the sugar standards (glucose syrup and dried glucose syrup, dextrose anhydrous and dextrose monohydrate) had been accepted and official confirmation of the type of acceptance would be made shortly. The delegate of Cuba explained that in his country all standards, particularly white sugar, were under study for acceptance and that a report would be made to FAO as soon as possible.

28. The Committee then "briefly considered each of the standards in turn.

#### White Sugar

29. Doubts were expressed about the methods of analysis for the determination of invert sugar content. It was, however, agreed that this could be dealt with during a general review of the methods of analysis for sugars. The point was also made that a review of methods of analysis should take into account the need to avoid complex and expensive methods wherever possible.

#### Powdered Sugar

30. This item had already been discussed (see paragraphs 13 and 14) but the delegate from Hungary stated that his Government could accept the standard with some deviations which would be specified.

#### Soft Sugars, Dextrose Anhydrous, Dextrose Monohydrate, Glucose Syrup and Dried Glucose Syrup

31. The Committee agreed that these standards should be left as they stood, subject to the various headings for criteria and methods of analysis being brought into line for individual standards.

32. In response to a question concerning the values adopted in the various standards, the representative of FAO explained that the values adopted had been based on good quality food products. It was accepted that pharmaceutical requirements might be more restrictive although there was very little difference between pharmaceutical values and the food values in several of the standards.

#### Lactose

33. The Committee agreed that the standard should be left as it stood.

#### Powdered Dextrose

34. This had already been discussed (see paragraphs 15 and 16).

#### ANY OTHER BUSINESS

##### Review of Methods of Analysis

35. It was pointed out that the Recommended Methods of Analysis (CAC/RM I/8-1969) contained several errors and were based on work carried out at least 10 years previously. It was suggested that the document should be referred to ICUMSA to have the errors corrected and the methods up-dated during and following the 16th Session of ICUMSA to be held in Ankara from 2-7 June 1974.

36. The representative of ICUMSA accepted the need to review all the methods of analysis laid down in the Recommended Methods (CAC/RM I/8 - 1969) or in individual standards in the light of developments and to correct any errors. He pointed out that this could take some time and said that all the views expressed, including the desire to simplify the methods recommended, would be taken into account. He requested that countries using methods other than those referred to in the standards should supply details of the methods in use so that consideration could be given to them. It would be particularly helpful if representatives of countries using simplified methods could attend the ICUMSA meeting.

37. The Committee agreed that ICUMSA should be requested to carry out such a review and also agreed that the methods of analysis of starch hydrolysis products would be more appropriate to ISO than to ICUMSA: the FAO Secretariat should therefore contact ISO to ensure coordination between the work being done by Codex and that by ISO.

##### Contaminants

38. In reply to the question concerning the future work of FAO and WHO on food contaminants the representative of FAO explained that "both agencies were developing an FAO/WHO Internationally Coordinated Programme on the Monitoring of Contaminants in Food. This programme was intended to implement recommendations of the UN Conference on Human Environment and was being financed in part by funds from the UN Environment Programme. The contaminants to be monitored in food would be chemical, biological and microbiological but in the first phase of the programme emphasis would probably be placed on heavy metal contaminants and persistent pesticides. The programme would be based on the national monitoring programmes of a selected number of member countries of FAO and WHO and gradually extended to other countries, in particular developing countries, in the later stages. FAO and WHO would be evaluating the load of contaminants in man's total diet and recommending limits for daily and weekly intake of contaminants, which would eventually enable more appropriate tolerances and maximum limits to be prescribed in food. The monitoring programme would have regard to the media other than food such as air and water, and would also need to have regard to the technological aspects of contaminants arising from manufacturing processes. A full report on the planning and progress to date of the proposed International Monitoring Programme would be placed before the 10th Session of the Codex Alimentarius Commission in July 1974.

##### Sampling Plans

39. The Danish delegate drew attention to errors in document CAC/RM 42-1969. It was agreed that the Danish comments should be put to the Working Party on Sampling of the Codex Methods of Analysis and Sampling Committee.

Next Meeting

40. It was agreed that in view of the work to be done by ICUMSA and the need for further experience of acceptances, the next meeting should be arranged by the United Kingdom and FAO Secretariats at an appropriate time.

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PROPOSED DRAFT STANDARD FOR FRUCTOSE

1. DESCRIPTION

Fructose is purified and crystallized D-fructose.

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

- 2.1 Specific Rotation  $[\alpha]_D^{20}$  (10g/100ml)  $[-91^\circ \text{ to } -93.5^\circ]$
- 2.2 Loss on drying (5 hours at 70° C) not more than 0.5% m/m
- 2.3 Sulphated Ash not more than 0.1% m/m
- 2.4 Colour not more than [60] ICUMSA units
- 2.5 pH (solution 10% m/m). [4.5 - 5.5]

3. FOOD ADDITIVES

None permitted

4. CONTAMINANTS

- 4.1 Arsenic (As) not more than 1 mg/kg
- 4.2 Copper (Cu) not more than .2 mg/kg
- 4.3 Lead (Pb) not more than [2] mg/kg

5. HYGIENE

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

6. LABELLING

In addition to Sections 1, 2, 4 and 6.1 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

The name of the product shall be "fructose".

6.2 Net Contents

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

6.3 Name and Address

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

6.4 Country of Origin

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

## 7. METHODS OF ANALYSIS AND SAMPLING

The methods of analysis and sampling referred to hereunder are international referee methods.

### 7.1 Determination of Specific Rotation

The solution is prepared by dissolving 10' g of fructose in 50 ml of distilled water, adding 0.2 ml of diluted ammonia solution (10\$ m/m ammonia) making up to 100 ml with distilled water and allowing to stand for 30 minutes. Preparation of the solution and measurement of specific rotation should be carried out at 20°0 + 0\*1°C. The specific rotation is calculated with reference to the anhydrous substance and according to the formula

$$[\alpha]_D^{20} = \frac{100}{l \cdot c} \alpha$$

where

- $\alpha$  is the observed rotation
- $l$  is the length of the observed, layer in dm
- $c$  is the number of g of anhydrous substance contained in 100 ml of solution

### 7.2 Determination of Loss on Drying

According to the FAO/WHO Codex Alimentarius Methods of Analysis for Sugars CAC/RM 1-1969, Determination of Total Solids Content, but dry the fructose at 70 C for 5 hours. Loss on drying is calculated according to the formula:

$$\% \text{ m/m loss on drying} = \frac{(\text{sample mass (g)} - \text{dry sample mass (g)})}{\text{sample mass (g)}} \times 100$$

### 7.3 Determination of Sulphated Ash

According to the ICUMSA single sulphation method (ICUMSA Methods of Sugar Analysis 1964, P«100, b. Ash).

#### 7.3.1 Calculation and Expression of Results

Results are expressed as % m/m sulphated ash, on a dry basis (see 7\*2) calculated as follows

$$\text{Percentage of Ash, sulphated} = \frac{\text{ash mass (g)} \times 100}{\text{dry sample mass (g)}}$$

### 7.4 Determination of Colour

According to the FAO/WHO Codex Alimentarius Method (FAO/WHO Codex Alimentarius Methods of Analysis for Sugars, CAC/RM 6-1969, Determination of Colour). Results are expressed in ICUMSA units.

### 7.5 Determination of pH

According to the ICUMSA method of pH measurement (ICUMSA Methods of Sugar Analysis, 1964, p.59) except that a 10% m/m solution of fructose is used for the determination.

### 7.6 Determination of Arsenic

According to the colorimetric (silver diethyldithiocarbamate) method of the Association of Official Analytical Chemists (Official Methods - AOAC 1965, 24.011 - 24.014, 24.016 -24.017, 24.006 - 24.008). Results are expressed as mg arsenic/kg.

#### 7.7 Determination of Copper

According to the ICUMSA method (ICUMSA Methods of Sugar Analysis, 1964, p.106, b. Copper). Results are expressed as mg copper/kg.

#### 7.8 Determination of Lead

According to the ICUMSA "wet-ashing" method (ICUMSA Methods of Sugar Analysis, 1964, p.48, c. "Wet-ashing" Procedure for Low Grade Products). Results are expressed as mg lead/kg.