CODEX ALIMENTARIUS COMMISSION

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Agenda Item 7 **CX/MAS 16/37/7-Add.1**
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JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING
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REVIEW AND UPDATE OF METHODS IN CODEX STAN 234-1999

(Prepared by Japan)

Background

1. Recognizing that CODEX STAN 234 will become the single and ever more important source of information on the Codex general analytical methods and analytical methods endorsed for checking compliance of food products with the Codex standards, and to help the eWG on update and review of the endorsed methods of analysis, Japan believes that the information contained in CODEX STAN 234 must be unambiguous, accurate and credible.

2. The first item of the terms of reference of the eWG is to continue working on the identification of inconsistencies in CODEX STAN 234 and other Codex Standards. In order to facilitate discussions of CX/MAS 16/37/7 and decisions by CCMAS for removing the identified inconsistencies, Japan went through the analytical methods contained in CODEX STAN 234 and currently or previously contained in other Codex standards, to identify inconsistencies within CODEX STAN 234 and those between CODEX STAN 234 and other standards for CCMAS to consider, as a part of eWG work.

3. The identified inconsistencies are grouped into three major categories according to who should first take actions, and then into subcategories according to individual problems, such as misclassification of the type of methods, use of terms and symbols, conversion factors related to methods. Each of three categories requires attention and actions of different bodies involved in CCMAS work:

(a) Issues for the CCMAS to discuss and decide on necessary action(s) (including issues that may require confirmation of the previous decisions of CCMAS);

(b) Issues for the standard developing organizations (SDOs) to clarify and, subsequently, the CCMAS to decide on necessary action(s); and

(c) Issues for future eWG or the Codex Secretariat to take action as they are editorial or format-related.

4. The details of individual problems of inconsistency are described below for immediate or future actions.

Recommendations

Japan proposes that:

(1) CCMAS should consider, at its 37th Session, the problems categorized under (a) above and make certain decisions for better consistency;

(2) CCMAS should request clarification by the SDOs of the problems categorized under (b) above; and

(3) The problems categorized under (c) should be taken into future versions of CODEX STAN 234.

Inconsistencies identified

(a) Issues for the CCMAS to discuss and decide on necessary action(s)

5. The Committee should reach an agreement on how to deal with the following issues in order to develop a single reference of the Codex Methods.

(a)-1 Different descriptions of commodity name in CODEX STAN 234-1999 and the related commodity standard (related to CX/MAS 16/37/7, para 25)

6. In the CODEX STAN 234, a number of analytical methods are recommended for a group of commodities whereas their corresponding provisions are not described in the related commodity standards. This would cause confusion on the coverage of commodities by the analytical method(s) of concern: applicable to any of commodities within the group or only those commodities specified in the related commodity standards. For example, while the methods for iron in "milk products" are listed in CODEX STAN 234, the provision on iron is included only in the Codex Standards for Milkfat Products (CODEX STAN 280) and for Edible Casein Products" (CODEX STAN 290). The Codex Committee on Contaminants in Foods (CCCF) did not establish a maximum level for iron in milk products either. (See the table below)

7. The CCMAS is invited to consider the following:

(i) Clarify if the methods are applicable for analysis of iron in all milk products; not only milkfat products and edible casein products but also other products such as yoghurt, cheese and so on.

a. If so, retain the current description and add a note to indicate this fact or, in the update, include all related Codex commodity standard numbers.

b. If not, replace the term "milk products" with "milkfat products and edible casein products"

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Milk products	Iron	NMKL 139	Atomic absorption spectrophotometry	II	280, 290
		AOAC 999.11 (Codex general method)	Atomic absorption spectrophotometry		
		NMKL 161 / AOAC 999.10	Atomic absorption spectrophotometry	III	
		AOAC 984.27	Inductively Coupled Plasma optical emission spectrophotometry	III	
		ISO 6732 | IDF 103	Spectrophotometry (bathophenanthroline)	IV	

Note for CCMAS consideration: there is a potential problem(s) of the Type and identical/different methods.

(a)-2 Provisions not specified in the relevant commodity standards (corresponding to CX/MAS 16/37/7, para 25, para 30 item 3)

8. There are some cases where provision(s) in the existing CODEX STAN 234 are not specified in the relevant Codex standard (e.g. Chloride, Magnesium, etc. in Natural mineral waters) while the General Criteria for the Selection of Methods of Analysis in the Procedural Manual states, "(d) All proposed methods of analysis must have direct pertinence to the Codex Standard to which they are directed." (Procedural Manual 24th Ed., p.73). The CCMAS is invited to consider whether these methods should be retained in or removed from CODEX STAN 234.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Natural mineral waters	Calcium	ISO 7980	Atomic absorption spectrophotometry	III	108
	Chloride	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol. 2, pp. 205-208		II	108
		AOAC 973.51	Titrimetry (Mercuric nitrate)	III	
		ISO 9297	Titrimetry	III	

Coliform organism, thermotolerant organism and presumptive Escherichia coli	ISO 9308-1	Membrane filtration	I	108
Faecal Streptococci	ISO 7899-2	Membrane filtration	I	108
Iron, dissolved	ISO 6332	Spectrophotometry	II	108
Magnesium	ISO 6059	Titrimetry	II	108
	ISO 7980	Atomic absorption spectrophotometry	III	
Phenols	ISO 6439	Spectrophotometry	I	108
Potassium	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol.2, pp. 142-145		II	108
Sodium	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol.2 pp. 148-151		II	108
	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol.2, pp. 151-152		III	108
Spores of sulphite-reducing anaerobes (Clostridia)	ISO 6461-2	Membrane filtration	I	108
Sulphates	ISO 9280	Gravimetry	III	108
Sulphide	Handb. Spurenanal. 1974		IV	108

(a)-3 Problem related to Typing of methods (corresponding to CX/MAS 16/37/7, paras 25, 28, 30)

9. When only one validated method, which cannot be categorized as Type I, has been recommended or endorsed for a certain commodity/provision combination, this method should be categorized as Type II, not Type III. In CODEX STAN 234, there are methods, each of which was recommended as the only method for a commodity/provision combination, were categorized as Type III while there were no corresponding Type II methods. For example, AOAC 981.12 recommended as the only one method for pH in fish sauce was categorized as Type III while there was no Type II method (see the table below).

10. There are also some cases where two methods for one commodity/provision combination were classified as Type II while there is no indication if they are the same method or different methods.

11. The CCMAS is invited to consider the typing of methods:

i. where there is only one method recommended for a commodity/analyte combination which is neither Type I or Type II method; and

ii. where there are two or more Type II methods recommended for a commodity/analyte combination.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fish Sauce	pH	AOAC 981.12 The pH shall be measured in a sample of fish sauce diluted with water to 1:10 using a pH meter. The dilution of fish sauce is necessary because of the high ionic strength in the undiluted sauce.	Electrometry	III	302

(a)-4 Incorporation of numerical provisions into the single working list (corresponding to CX/MAS 16/37/7, para 23)

12. In response to the suggestion to include numerical provisions in single reference made at the last session of the CCMAS (REP 15/MAS, para. 108), the discussion paper for the current session (CCMAS 16/37/7) proposed inclusion of numerical provisions in a new working format of the single document. For some commodities, subcategories are defined in the relevant Codex standard, and a number of different numerical provisions for a provision (i.e. quality factor or food safety related standard) are stipulated for each subcategory. As a result, descriptions of numerical provisions are in some cases too many for a cell in the EXCEL working sheet. (See the table below). Insertion of hyperlinks to Codex standards would be useful, efficient and space-saving for the list.

13. The CCMAS is invited to consider if the relevant numerical provisions should be included in the list of analytical methods or insertion of the hyperlinks to Codex standards is sufficient.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*	*Numerical provisions*
Cheese	Milkfat	ISO 1735|IDF 5	Gravimetry (Schmid-Bondzynski-Ratslaff)	I	208, 221, 283	High fat (if the content of FDM is above or to 60%) Full fat (if the content of FDM is above or to 45% and less than 60%) Medium fat (if the content of FDM is above equal to 25% and less than 45%) Partially skimmed (if the content of FDM is above or equal to 10% and less than 25%) Skim (if the content of FDM is less than 1

(a)-5 Use of the term “codex general method” (corresponding to CX/MAS 16/37/7, paras 15, 25)

14. Many of the Codex general methods are contained in the Codex Standard on General Methods of Analysis for Contaminants (CODEX STAN 228). In addition, a number of methods applicable to a group or groups of commodities contained in CODEX STAN 234 are mentioned as Codex general method, e.g. AOAC 968.30 for drained weight of processed fruits and vegetables. However, another method applicable to drained weight of fish and fishery canned products is not.

15. The use of the term, “Codex general method” within CODEX STAN 234 does not seem to be consistent (as above, and the same method is referred as Codex general method in one place and not in the other).

16. The CCMAS is invited to revisit or consider below in relation to the use of the term “Codex general method” and CODEX STAN 228, CODEX STAN 231 and CODEX STAN 239[1] for consistency and usability:

(i) Whether the content of CODEX STAN 228 should be incorporated in CODEX STAN 234 for better reference;

[1] The content of CODEX STAN 239-2003 is already incorporated in CODEX STAN 234 without reference to the “Codex general method”.

(ii) Whether the term “Codex general method” should apply to those methods applicable to all foods (“all foods” and all foods with some exceptions, e.g. all foods except fats and oils) or those applicable to a group or groups of foods, or the term should not be used;

(iii) Whether to indicate that a method is Codex general method throughout CODEX STAN 234;

(iv) When there is a Codex general method(s) recommended for a specific commodity/provision combination, whether the Codex general method(s) should be given a priority over other methods, unless otherwise stated, which is consistent with the description in the General Criteria for the Selection of Methods of analysis in the Procedural Manual which states, “Methods of analysis which are applicable uniformly to various groups of commodities should be given preference over methods which apply only to individual commodities” (Procedural Manual 24th Ed., p.73); and

(v) Whether to add a footnote when the type of “Codex general method” recommended for a specific commodity/provision combination is different from that in CODEX STAN 228, e.g. AOAC 972.25 is a Codex general method for lead in all foods as Type III but this method is endorsed as Type II for lead in butter.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fish and fishery products: canned products	Drained weight	Described in the Standard	Weighing	I	3, 90, 94, 119, 37
Processed fruits and vegetables	Drained Weight	AOAC 968.30 (Codex General Method)	Sieving Gravimetry	I	38, 42, 60, 62, 78, 99, 145, 223, 241, 254, 260, 297, 319
Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
All foods (except fats and oils)	Lead, cadmium, copper, iron and zinc	NMKL 139 AOAC 999.11	AAS after dry ashing	II	228
All foods (except fats and oils)	Lead, cadmium, copper, iron and zinc	NMKL 161 AOAC 991.10	AAS after microwave digestion	III	228
All foods	Lead	AOAC 972.25	AAS	III	228
All foods except fats and oils	Lead	AOAC 982.23	Anodic stripping voltametry	III	228
All foods	Lead	AOAC 986.15	Anodic stripping voltametry	III	228
Butter	Lead	AOAC 972.25(Codex general method)	Atomic absorption spectrophotometry	II	279
Fats and Oils (all)	Lead	AOAC 994.02 ISO 12193 (Codex general method) AOCS Ca 18c-91	Atomic absorption spectrophotometry (direct graphite furnace)	II	19, 33, 210, 211, 256

(b) Issues for the standard developing organizations (SDOs) to clarify and, subsequently, the CCMAS to decide on necessary action(s)

(b)-1 Multiple Type I methods for one commodity/provision combination (corresponding to CX/MAS 16/37/7, para 25)

17. The Procedural Manual indicates that only one method can be recommended as Type I or Type II for one commodity/provision combination (24th Procedural Manual, p.72). However, in a number of cases, more than one methods are recommended as Type I methods for one commodity/provision combination (for two or more Type II methods, see the above section (a)-3. The SDOs are invited to give information on their equivalence, too.). Unless the methods classified as Type I are identical, all of them cannot be classified as Type I. And if there is one Type I method recommended, there should not be other methods recommended for the same commodity/provision combination. For example, AOAC 977.10 and AOAC 931.04 are both adopted as Type I method while the principles of the methods are different (Karl Fischer method and Oven method) (see the table below).

18. In these cases, the CCMAS is invited to request SDOs to clarify whether the Type I methods listed for the same commodity/provision combination are identical or not, and then CCMAS should revise the list.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Chocolate and chocolate products	Moisture	AOAC 977.10 | IOCCC 26-1988	Gravimetry (Karl Fischer method)	I	87
		AOAC 931.04 | IOCCC 26-1988	Gravimetry (Oven method)		

(b)-2 Use of connecting symbols in enumeration of multiple methods (corresponding to CX/MAS 16/37/7, para 25)

19. The way listing more than one method for one provision/type is not consistent in CODEX STAN 234: methods are separated by various symbols such as "|", ":", "/", "and", and "or".

20. The CCMAS is invited to consider the equivalency of the methods with the information from the relevant SDOs, and clearly distinguish the relationship between those methods separated by the symbols in the new single document.

21. The following shows proposals for the descriptions of multiple methods according to different situations:

- Identical methods should be divided with "|" and not with comma (,) or semicolon (;), e.g. "A method | B method".

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Cheese	Moisture	ISO 5534|IDF 4	Gravimetry, drying at 102 °C	I	278, 283

- When multiple methods should be used in combination in an analysis, these methods should be connected with "and", e.g. "A method and B method" (e.g. preparation procedure and determination).

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Cocoa (Cacao) Mass or Cocoa/ Chocolate Liquor, and Cocoa Cake	Cocoa shell	AOAC 968.10 and 970.23	Spiral vessel count, Stone cell count	I	141

- When multiple different Type III or Type IV methods are recommended, they should be listed in different rows of the table.

In the existing list

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	Benzoic acid and its salts	ISO 5518, ISO 6560	Spectrometry	III	247

After proposed revision

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	Benzoic acid and its salts	ISO 5518	Spectrometry	III	247
		ISO 6560	Spectrometry		

(b)-3 Description of Principle of methods (corresponding to CX/MAS 16/37/7, para 24)

22. In some cases, different descriptions of principle were given for the identical method recommended for different commodities. The analytical principles should be consistent throughout CODEX STAN 234 unless otherwise necessary.

23. The CCMAS is invited to request SDOs to clarify what should be the best description of their relevant methods identified to have different descriptions and then CCMAS should revise the list.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fish Sauce	pH	AOAC 981.12	Electrometry	III	302
Processed fruits and vegetables	pH	AOAC 981.12	Potentiometry	III	13 ,57, 115, 160, 240, 241, 260

(b)-4 Dates of the methods of analysis (cf. CX/MAS 16/37/7, para 22)

24. The CCMAS already agreed at the 36th Session to include three types of dates of method: publication, revision and CCMAS endorsement[2]. However, several ways exist for referring to 'publication date' and 'revision date'. The 'publication date' refers to the publication date of the *First Edition* , or the *Latest Edition* of a method, or the date when a method was adopted (and published) as Codex Standard. The 'revision date' refers to the publication date of the *latest edition* with significant changes from the original method, the date of last review/reapproval with or without significant changes, or the date when a method was re-endorsed by CCMAS. In order to avoid confusion in further work, more specific definitions are useful and necessary.

For regular update by the CCMAS, the CCMAS is invited to consider:

(i) To request SDOs to kindly provide information on the publication and revision dates;

(ii) That the 'publication date' should be the year when the *latest edition* was published by the relevant SDO;

(iii) That the 'revision date' should be the year when a method was last reviewed/reapproved by the relevant SDO with or without significant changes from the original method; and

(iv) That the date of endorsement by the CCMAS should be the latest endorsement if the method has been endorsed multiple times previously.

[2] REP 14/MAS, paras.71-72

(c) Issues for future eWG or the Codex Secretariat to take action as they are editorial or format-related

(c)-1 Conversion factor for the determination of specific provision (corresponding to CX/MAS 16/37/7 para 25)

25. Some methods need conversion factors in the determination of values such as protein or amino acids content.

26. The following is the proposal to deal with this issue:

- A conversion factor should only be included in the column of "Provision" when a specific conversion factor has already been contained in the relevant Codex commodity standard

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Durum wheat semolina and durum wheat flour	Protein (N x 5.7)	ICC 105	Titrimetry, Kjeldahl digestion	I	178

- When the description of an endorsed method contains a conversion factor, the conversion factor need not be denoted in the CODEX STAN 234 unless multiple conversion factors for similar commodities are shown in the method and users of the method need to choose one suitable factor. In this case, the method should be endorsed as Type I.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Wheat protein products including wheat gluten	Protein	Vital wheat gluten and devitalized wheat gluten AOAC 979.09 (wheat protein in grain Nx5.7)	Kjeldahl	I	163
		Solubilized wheat protein AOAC 920.87 (wheat protein in flour Nx5.7)	Kjeldahl	I	

- A conversion factor should be clearly described in the column of "Method", when a method determines nitrogen content only and no conversion factor is mentioned in the description of the method. In this case, the method should be endorsed as Type II when the method is validated in a collaborative study.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Soy protein products	Protein	AOAC 955.04D (using factor 6.25)	Titrimetry , Kjeldahl digestion	II	175

(c)-2 Method performance criteria for fish and fishery products (corresponding to CX/MAS 16/37/7, para 15)

27. The method criteria were agreed to by the CCMAS for the determination of histamine in smoked fish, smoke-flavoured fish and smoked-dried fish at the 34th Session[3]. As the CCMAS at that session also agreed that the same criteria would apply to all related products[4] and the same criteria have already been included in all the related Codex commodity standards, the title of the method criteria in concern should be corrected to read "Method Performance criteria for Fish and Fishery Products. (see the table below).

[3] REP13/MAS, Appendix II
[4] REP 13/MAS, para.18

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fish and fishery products	Histamine	AOAC 977.13	Fluorimetry	II	36, 70, 94, 119, 165, 236, 244, 311

Method Performance Criteria for histamine in smoked fish, smoke-flavoured fish and smoke-dried fish

Provision	ML (mg/100 g)	Minimum applicable range (mg/100 g)	LOD (mg/100 g)	LOQ (mg/100 g)	RSD_R(%)	Recovery	Applicable methods that meet the criteria	Principle
Histamine	10 (average)	8 – 12	1	2	16.0	90 – 107	AOAC 977.13 | NMKL 99, NMKL 196,	Fluorometric HPLC
Histamine	20 (each unit)	16 – 24	2	4	14.4	90 – 107	AOAC 977.13 | NMKL 99, NMKL 196,	Fluorometric HPLC

(c)-3 Methods of analysis for revoked commodity standards

28. There are several methods of analysis adopted for already-revoked commodity standards (e.g. margarine and minarine).These methods of analysis should be removed from CODEX STAN 234 when the standards are revoked since they are no longer reviewed and updated.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Margarine	Fat	IUPAC 2.801	Gravimetry	I	32 (revoked)
	Milkfat	CAC/RM 15-1969	Titrimetry	I	
	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
	Vitamin A	AOAC 960.45	Spectrophotometry	II	
	Vitamin D	AOAC 936.14	Bioassay	II	
	Vitamin E	IUPAC 2.411	TLC followed by spectrophotometry or GLC	II	
	Water	CAC/RM 17-1969 (described in the Standard)	Gravimetry	I	
Minarine	Fat	IUPAC 2.801	Gravimetry	I	135 (revoked)
	Milkfat	CAC/RM 15-1969 (described in the Standard)	Titrimetry	I	
	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
	Vitamin A	AOAC 960.45	Spectrophotometry	II	
	Vitamin D	AOAC 936.14	Bioassay	II	
	Vitamin E	IUPAC 2.411	TLC followed by spectrophotometry or GLC	II	
	Water	CAC/RM 17-1969	Gravimetry	I	

(c)-4 Methods of analysis that are no longer available/accessible (e.g. ex-RM methods) (CX/MAS 16/37/7, para 30 item 1)

29. The CCMAS decided to revoke all RM numbers and replace them with the reference or the text of the methods (ALINORM 97/23, para 52, 22nd CAC report, para 145). Most of the ex-RM methods were replaced accordingly. However, some of them are still retained in CODEX STAN 234 while their references were no longer accessible (e.g. CAC/RM 52 for mineral oil, CAC/RM55-1976 for fat).

30. The CCMAS is invited to consider how to deal with these methods.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Raisins	Mineral oil	CAC/RM 52	Extraction and separation on alumina	II	67
Soy protein products	Fat	CAC/RM 55-1976 - Method 1	Gravimetry (extraction)	I	175
Vegetable protein products	Fat	CAC/RM 55-1976 - Method 1	Gravimetry (extraction)	I	174
Special foods	Fat	CAC/RM 55-1976	Gravimetry (extraction)	I	181, 203

Appendix

(a) Issues for the CCMAS to discuss and decide on necessary action(s)

(a)-1 Different descriptions of commodity name in CODEX STAN 234-1999 and the related commodity standard

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fish and fishery products	Histamine	AOAC 977.13	Fluorimetry	II	36, 70, 94, 119, 165,236, 244
Fish and fishery products: canned products	Drained weight	Described in the Standard	Weighing	I	3, 37, 70, 90, 94, 119
	Net weight	Described in the Standard	Weighing	I	
Frozen fish and fishery products	Thawing and cooking procedures	Described in the Standards	Thawing and heating	I	36, 92, 95, 165, 166, 190, 191, 312, 315
Special foods	Ash	AOAC 942.05	Gravimetry	I	N/A
	Calcium	AOAC 984.27	ICP emission spectrometry	III	181, 203
	Calories by calculation	Method described in CAC/VOL IX-Ed.1, Part III	Calculation method	III	74, 181, 203
	Carbohydrates	Method described in CAC/VOL IX-Ed.1, Part III	Calculation	III	74, 181, 203
	Chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	53, 73, 181
	Dietary fibre, total	AOAC 985.29	Gravimetry (enzymatic digestion)	I	N/A
	Fat	CAC/RM 55-1976	Gravimetry (extraction)	I	181, 203
	Fat in foods not containing starch, meat or vegetable products	CAC/RM 1, B-2	Gravimetry	I	N/A
	Fill of containers	CAC/RM 46	Weighing	I	73, 181, 203
	Folic acid	AOAC 944.12	Microbioassay	II	203, 181
	Linoleate (in the form of glycerides)	AOAC 922.06; 969.33; 963.22	Acid hydrolysis, preparation of methyl esters and gas chromatography	II	74, 181, 203
		AOAC 922.06; 979.19	Acid hydrolysis and spectrophotometry	III	
	Loss on drying (milk based)	AOAC 925.23 ISO 6731|IDF 21:2010	Gravimetry	I	N/A

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
	Nicotinamide for foods not based on milk	AOAC 961.14	Colorimetry	II	181, 203
	Nicotinamide for milk-based foods	AOAC 944.13	Microbioassay	II	181, 203
	Pantothenic acid/enriched foods	AOAC 945.74	Microbioassay	II	72, 156
	Pantothenic acid/non-enriched foods	The Analyst 89 (1964):1, 3-6, ibid. 232 US Dept Agr., Agr. Handbook 97 (1965)	Microbioassay	IV	72, 156
	Phosphorous	AOAC 986.24	Colorimetry (molybdovanadate)	II	181, 203
	Protein efficiency ratio (PER)	AOAC 960.48	Rat bioassay	I	74
	Protein, crude	Method described in CAC/VOL IX-Ed. 1, Part III	Titrimetry, Kjeldahl digestion	I	74, 181, 203
	Riboflavin	AOAC 970.65	Fluorometry	II	181, 203
	Sodium and Potassium	ISO 8070|IDF 119	Flame atomic absorption spectrometry	II	53, 74, 181, 203
		AOAC 984.27	ICP emission spectrometry	III	
	Vitamin A	AOAC 974.29	Colorimetry	IV	74, 181, 203
	Vitamin A in foods in which carotenes have been added as a source of vitamin A	AOAC 941.15	Spectrophotometry	III	74, 181, 203
	Vitamin B_{12}	AOAC 952.20	Microbioassay	II	181, 203
	Vitamin B_6	AOAC 961.15	Microbioassay	II	181, 203
	Vitamin C	AOAC 967.22	Microfluorometry	II	181, 203
		AOAC 967.21	Colorimetry (dichloroindophenol)	III	
	Vitamin D	AOAC 936.14	Rat bioassay	IV	74, 181, 203
	Vitamin D (D_3, milk based infant formula)	AOAC 992.26	Liquid chromatography	II	72
	Vitamin E	AOAC 971.30	Colorimetry	IV	181, 203
	Vitamin E (milk based infant formula)	AOAC 992.03	Liquid chromatography	II	72

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Milk products	Iron	NMKL 139 AOAC 999.11 (Codex general method)	Atomic absorption spectrophotometry	II	280, 290
		NMKL 161 / AOAC 999.10	Atomic absorption spectrophotometry	III	
		AOAC 984.27	Inductively Coupled Plasma optical emission spectrophotometry	III	
		ISO 6732 | IDF 103	Spectrophotometry (bathophenanthroline)	IV	
Milk and Milk Products	Melamine	ISO/TS 15495 | IDF/RM 230	LC-MS/MS	IV	N/A (193)
Milk products (products not completely soluble in ammonia)	Milk fat	ISO 8262-3|IDF 124-3	Gravimetry (Weibull-Berntrop)	I	N/A
Processed fruits and vegetables	Benzoic acid	NMKL 124	Liquid Chromatography	II	66 ,115, 160, 177, 240, 260, 296
		NMKL 103 AOAC 983.16	Gas Chromatography	III	
	Calcium	AOAC 968.31	Complexometry/ Titrimetry	II	99, 115, 241, 260, 296, 297, 319
	Drained Weight	AOAC 968.30 (Codex General Method)	Sieving Gravimetry	I	38, 42, 60, 62, 78, 99, 145, 223, 241, 254, 260, 297, 319
	Fill of containers	CAC/RM 46 (reference to “metal containers” deleted and refer to ISO 90-1 for determination of water capacity in metal containers)	Weighing	I	13, 38, 42, 57, 60, 62, 78, 99, 115, 145, 240, 241, 242, 254, 260, 297, 319

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
	Lead	AOAC 972.25 (Codex general method)	AAS (Flame absorption)	III	13, 42, 57, 60, 62, 78, 99, 115, 145, 160, 242, 254, 260, 296, 297
	Packing medium Canned berry fruits (raspberry, strawberry)	AOAC 932.12 ISO 2173	Refractometry	I	60, 62
Processed fruits and vegetables (except canned bamboo shoots, pH determined by AOAC 981.12)	pH	ISO 1842	Potentiometry	IV	241
Processed fruits and vegetables	pH	AOAC 981.12	Potentiometry	III	13, 57, 115, 160, 240, 241, 260
		NMKL 179	Potentiometry	II	
	Soluble solids	ISO 2173	Refractometry	I	13, 42, 60, 62, 78, 99, 115, 145, 160, 254
		AOAC 932.12	Refractometry		
	Sorbates	NMKL 103 / AOAC 983.16	Gas Chromatography	III	66, 115, 130, 160, 177, 260, 296
		NMKL 124	Liquid Chromatography	II	
	Tin	AOAC 980.19 (Codex general method)	AAS	II	13, 42, 57, 60, 62, 78, 99, 115, 145, 160, 242, 254, 260, 296, 297
	Total solids	AOAC 920.151	Gravimetry	I	240

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Meat Products	Nitrates and/or Nitrites	EN 12014-3	Spectrometric determination of nitrate and nitrite content of meat products after enzymatic reduction of nitrate to nitrite	III	192
		EN 12014-4	Ion-exchange chromatographic method	III	
		NMKL 165			
Processed meat and poultry products	Fat	ISO 1443	Gravimetry	I	89, 96, 97, 98
	Lead	AOAC 934.07	Colorimetry (dithizone)	II	(193)
	Nitrates	ISO 3091	Colorimetry (cadmium reduction)	II	N/A
	Nitrites	ISO 2918	Colorimetry	IV	192
	Tin	AOAC 985.16 (Codex general method)	Atomic absorption spectrophotometry	II	88, 89, 96, 97, 98
	Nitrogen/protein	ISO 937	Titrimetry	II	96, 97

(a)-2 Provisions not specified in the relevant commodity standards

For each commodity in the table below, relevant commodity standards do not mention the provisions.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Quick frozen blocks of fish fillet, minced fish flesh and mixtures of fillets and minced fish flesh	Sodium chloride	AOAC 971.21 (Codex general method)	Potentiometry	II	165
Quick frozen fish sticks (fish fingers) and fish portions - breaded or in batter	Sodium chloride	AOAC 971.21 (Codex general method)	Potentiometry	II	166
Follow-up formula	Dietary fibre, total	AOAC 991.43	Gravimetry (enzymatic digestion)	I	156
Butter	Copper	ISO 5738 | IDF 76 AOAC 960.40	Photometry, diethyldithiocarbamate	II	279 (193)
	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II	279 (193)

	Vegetable fat (sterols)	ISO 12078 | IDF 159	Gas chromatography	II	279
		ISO 18252 | IDF 200	Gas chromatography	III	279
Dairy fat spreads	Milkfat purity	ISO 17678|IDF 202	Calculation from determination of triglycerides by gas chromatography	I	253
	Vegetable fat (sterols)	ISO 12078|IDF 159	Gas chromatography	II	253
		ISO 18252 | IDF 200	Gas chromatography	III	253
Milk fat products	Milk fat purity	ISO 17678|IDF 202	Calculation from determination of triglycerides by gas chromatography	I	280
	Vegetable fat (sterols)	ISO 12078|IDF 159	Gas chromatography	II	280
		ISO 18252 | IDF 200	Gas chromatography	III	280
Whey powders	Copper	AOAC 985.35	Atomic absorption spectrophotometry	II	289
		ISO 5738|IDF 76	Photometry (diethyldithiocarbamate)	III	289
Natural mineral waters	Calcium	ISO 7980	Atomic absorption spectrophotometry	III	108
	Chloride	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol. 2, pp. 205-208		II	108
		AOAC 973.51	Titrimetry (Mercuric nitrate)	III	
		ISO 9297	Titrimetry	III	
	Coliform organism, thermotolerant organism and presumptive Escherichia coli	ISO 9308-1	Membrane filtration	I	108
	Faecal Streptococci	ISO 7899-2	Membrane filtration	I	108
	Iron, dissolved	ISO 6332	Spectrophotometry	II	108
	Magnesium	ISO 6059	Titrimetry	II	108
		ISO 7980	Atomic absorption spectrophotometry	III	
	Phenols	ISO 6439	Spectrophotometry	I	108
	Potassium	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol.2, pp. 142-145		II	108

	Sodium	Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol.2 pp. 148-151		II	108
		Examination of Water Pollution Control. WHO Pergamon Press (1982) Vol.2, pp. 151-152		III	108
	Spores of sulphite-reducing anaerobes (Clostridia)	ISO 6461-2	Membrane filtration	I	108
	Sulphates	ISO 9280	Gravimetry	III	108
	Sulphide	Handb. Spurenanal. 1974		IV	108
Canned stone fruits	Soluble solids	AOAC 932.14C	Refractometry	I	242
Certain canned citrus fruits	Calcium	NMKL 153	Atomic Absorption Spectrophotometry	II	254
		AOAC 968.31	Complexometry Titrimetry	III	254
Honey	Sugars added (for sugar profile)	AOAC 998.18	Carbon isotope ratio mass spectrometry	I	12
	Sugars added: detection of corn and cane sugar products	AOAC 978.17	Carbon isotope ratio mass spectrometry	I	
Sugars (powdered sugar)	Polarization	ICUMSA GS 2/3-1 after filtration if necessary to remove any anticaking agents	Polarimetry	II	212

For the provisions in the table below, no relevant commodity standard exists in the group commodities.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Milk products (products not completely soluble in ammonia)	Milk fat	ISO 8262-3|IDF 124-3	Gravimetry (Weibull-Berntrop)	I	N/A
Special foods	Ash	AOAC 942.05	Gravimetry	I	N/A
	Dietary fibre, total	AOAC 985.29	Gravimetry (enzymatic digestion)	I	N/A
	Fat in foods not containing starch, meat or vegetable products	CAC/RM 1, B-2	Gravimetry	I	N/A
	Loss on drying (milk based)	AOAC 925.23 ISO 6731|IDF 21	Gravimetry	I	N/A

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Quick frozen fruits and vegetables	Net weight	CAC/RM 34	Weighing	I	N/A
	Thawing procedure	CAC/RM 32	Thawing	I	N/A
	Cooking procedure	CAC/RM 33	Cooking	I	N/A
Processed meat and poultry products	Nitrates	ISO 3091	Colorimetry (cadmium reduction)	II	N/A

(a)-3 Problem related to Typing of methods

The methods of analysis in the table below are categorised as Type III while they are only methods for the commodity.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
All foods	Saccharin	EN 128556	High performance liquid chromatography	III	239
Individual foods[2]	Sulphites	EN 1988-1 AOAC 990.28	Part 1: Optimized Monier-Williams method	III	239
Individual foods[3]	Sulphites	EN 1988-2 NMKL 135	Part 2: Enzymatic method	III	239

(Footnotes in CODEX STAN 234)

[2] Hominy, fruit juice, sea food

[3] Wine, dried apples, lemon juice, potato flakes, sultanas, beer

Peanuts (intended for further processing)	Aflatoxins, total	AOAC 975.36	Romer minicolmn	III	200
Peanuts (Cereals, shell-fruits and derived products (including peanuts))	Sum of aflatoxins B1, B2, G1 and G2	EN 12955 ISO 16050	HPLC with post column derivatization and immunoaffinity column clean up	III	200
Peanuts (intended for further processing)	Aflatoxins, total	AOAC 979.18	Holaday-Velasco minicolumn	III	200
Fish oils	Fatty acid composition	ISO 5508	Gas chromatography	III	Adopted at Step 5 by the 38th CAC
		ISO 12966-2	Gas chromatography	III	
		AOCS Ce 1b-89	GLC	III	
		AOCS Ce 1-07	Capillary GLC	III	
		AOCS Ce 2b-11	Alkali hydrolysis	III	
		AOCS Ce 1a-13	Capillary GLC	III	

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		AOCS Ce 2-66	Preparation of methyl esters by fatty acids	III	
Fish Sauce	pH	AOAC 981.12 The pH shall be measured in a sample of fish sauce diluted with water to 1:10 using a pH meter. The dilution of fish sauce is necessary because of the high ionic strength in the undiluted sauce.	Electrometry	III	302
Smoked Fish, Smoke-Flavoured fish and Smoke-dried fish	Water activity	NMKL 168 | ISO 21807	Electrometry	III	311
Special foods	Calcium	AOAC 984.27	ICP emission spectrometry	III	181, 203
	Calories by calculation	Method described in CAC/VOL IX-Ed.1, Part III	Calculation method	III	74, 181, 203
	Vitamin A in foods in which carotenes have been added as a source of vitamin A	AOAC 941.15	Spectrophotometry	III	74, 181, 203
Infant formula	Chloride	AOAC 986.26	Potentiometry	III	72
	Total phospholipids	AOCS Ja7b-91	Gas chromatography with suitable extraction and preparation procedures	III	72
	Vitamin A	EN 12823-1 (all-trans-retinol and 13-cis-retinol) Vitamin A (both natural + supplemental ester forms) aggregated and quantified as individual retinol isomers (13 - cis and all-trans)	HPLC	III	72
Fruit Juices and Nectars	Malic acid (additives)	AOAC 993.05	Enzymatic determination and HPLC	III	247
	Preservatives in fruit juices (sorbic acid and its salts)	ISO 5519:	Spectrometry	III	
	Quinic, malic & citric acid in cranberry juice cocktail and apple juice (permitted ingredients and additives)	AOAC 986.13	HPLC	III	
	Benzoic acid as a marker in orange juice	AOAC 994.11	HPLC	III	
	Naringin and neohesperidin in orange juice	AOAC 999.05	HPLC	III	

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
	Vitamin C (dehydro-ascorbic acid and ascorbic acid)	AOAC 967.22	Microfluorometry	III	

(a)-5 Use of the term “codex general method”

The table below lists general methods of analysis for contaminants in CODEX STAN 228.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
All foods (except fats and oils)	Lead, cadmium, copper, iron and zinc	NMKL 139	AAS after dry ashing	II	228
		AOAC 999.11	AAS after dry ashing	II	
All foods (except fats and oils)	Lead, cadmium, copper, iron and zinc	NMKL 161	AAS after microwave digestion	III	228
		AOAC 991.10	AAS after microwave digestion	III	
All foods	Cadmium	AOAC 986.15	Anodic stripping voltametry	III	228
All foods	Copper	AOAC 960.40	Colorimetry (diethyldithiocarbamate)	III	228
All foods	Lead	AOAC 972.25	AAS	III	228
All foods except fats and oils	Lead	AOAC 982.23	Anodic stripping voltametry	III	228
All foods	Lead	AOAC 986.15	Anodic stripping voltametry	III	228
All foods	Zinc	AOAC 969.32	AAS	III	228
All foods	Zinc	AOAC 986.15	AAS	III	228

The table below lists general methods of analysis for food additives in CODEX STAN 239.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
All foods	Acesulfame K, Aspartame	EN 12856	High performance liquid chromatography	II	239
All foods	Cyclamate	EN 12857	High performance liquid chromatography	II	239
All foods	Cyclamate	NMKL 123	Spectrophotometry	III	239
All foods	Saccharin	EN 12856	High performance liquid chromatography	II	239
Individual foods[2]	Sulphites	EN 1988-1 AOAC 990.28	Part 1: Optimized Monier-Williams method	III	239
Individual foods[3]	Sulphites	EN 1988-2	Part 2: Enzymatic method	III	239

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		NMKL 135			

(Footnotes in CODEX STAN 234)

[2] Hominy, fruit juice, sea food

[3] Wine, dried apples, lemon juice, potato flakes, sultanas, beer

The table below lists methods of analysis labelled as “general codex methods” in CODEX STAN 234.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fats and Oils (all)	Arsenic	AOAC 952.13 (Codex general method)	Colorimetry (diethyldithiocarbamate)	II	19, 33, 210, 211, 256
		AOAC 942.17 (Codex general method)	Colorimetry (molybdenum blue)	III	
		AOAC 986.15 (Codex general method)	Atomic absorption spectrophotometry	III	
Fats and Oils (all)	Lead	AOAC 994.02	Atomic absorption spectrophotometry (direct graphite furnace)	II	19, 33, 210, 211, 256
		ISO 12193 (Codex general method)	Atomic absorption spectrophotometry (direct graphite furnace)	II	
		AOCS Ca 18c-91	Atomic absorption spectrophotometry (direct graphite furnace)	II	
Fats and oils not covered by individual standards	Copper and Iron	AOAC 990.05	Atomic absorption Spectrophotometry (direct graphite furnace)	II	19
		ISO 8294	Atomic absorption Spectrophotometry (direct graphite furnace)	II	
		AOCS Ca 18b-91 (Codex general method)	Atomic absorption Spectrophotometry (direct graphite furnace)	II	
Named Animal Fats	Copper and Iron	AOAC 990.05	Atomic absorption Spectrophotometry (direct graphite furnace)	II	211
		ISO 8294	Atomic absorption Spectrophotometry (direct graphite furnace)	II	
		AOCS Ca 18b-91 (Codex general method)	Atomic absorption Spectrophotometry (direct graphite furnace)	II	
Margarine	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	N/A
Minarine	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	N/A

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Quick frozen blocks of fish fillet, minced fish flesh and mixtures of fillets and minced fish flesh	Sodium chloride	AOAC 971.21 (Codex general method)	Potentiometry	II	165
Quick frozen fish sticks (fish fingers) and fish portions - breaded or in batter	Sodium chloride	AOAC 971.21 (Codex general method)	Potentiometry	II	166
Special foods	Chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	53, 73, 181
Fruit Juices and Nectars	Chloride in vegetable juice	AOAC 971.27 (Codex general method)	Titration	II	247
Milk products	Iron	AOAC 999.11 (Codex general method)	Atomic absorption spectrophotometry	II	280, 290
Butter	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II*	279
Edible casein products	Lead	NMKL 139 (Codex general method)	Atomic absorption spectrophotometry	II	290
		AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	III	
		AOAC 982.23 (Codex general method)	Anodic stripping voltanmetry	III	
Whey powders	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II	289
Processed fruits and vegetables	Drained Weight	AOAC 968.30 (Codex General Method)	Sieving Gravimetry	I	38, 42, 60, 62, 78, 99, 145, 223, 241, 254, 260, 297, 319
	Lead	AOAC 972.25 (Codex general method)	AAS (Flame absorption)	III	13, 42, 57, 60, 62, 78, 99, 115, 145, 160, 242, 254, 260, 296, 297

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
	Tin	AOAC 980.19 (Codex general method)	AAS	II	13, 42, 57, 60, 62, 78, 99, 115, 145, 160, 242, 254, 260, 296, 297
Canned Apple Sauce	Fill of containers	CAC/RM 46 (for glass containers) (Codex general method for processed fruits and vegetables) and ISO 90-1.1 (for metal containers) (Codex general method for processed fruits and vegetables)	Weighing	I	17
	Soluble solids	ISO 2173 (Codex general method for processed fruits and vegetables)	Refractometry	I	
Pickled cucumbers	Salt in brine	AOAC 971.27 (Codex general method)	Potentiometry	II	
Processed tomato concentrates	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	57
Table olives	Drained weight	AOAC 968.30 (Codex general method for processed fruits and vegetables)	Sieving Gravimetry	I	66
	Fill of containers	CAC/RM 46 (for glass containers) (Codex general method for processed fruits and vegetables) and ISO 90-1.1 (for metal containers) (Codex general method for processed fruits and vegetables)	Weighing	I	
	pH of brine	NMKL 179 (Codex general method for processed fruits and vegetables)	Potentiometry	II	
	Lead	AOAC 999.11 | NMKL 139 (Codex general method)	AAS (Flame absorption)	II	
Processed meat and poultry products	Tin	AOAC 985.16 (Codex general method)	Atomic absorption spectrophotometry	II	88, 89, 96, 97, 98
Canned corned beef	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II*	88
	Nitrites, potassium and/or sodium salt	AOAC 973.31 (Codex general method)	Colorimetry	II	
	Tin (Products in tinplate and other containers)	AOAC 985.16 (Codex general method)	Atomic absorption spectrophotometry	II	
Cooked cured chopped meat	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II*	98
	Nitrites	AOAC 973.31 (Codex general method)	Colorimetry	II	

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Cooked cured ham	Nitrites	AOAC 973.31 (Codex general method)	Colorimetry	II	96
Cooked cured pork shoulder	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II*	97
	Nitrites	AOAC 973.31 (Codex general method)	Colorimetry	II	
Luncheon meat	Lead	AOAC 972.25 (Codex general method)	Atomic absorption spectrophotometry	II*	89
	Nitrites, potassium and/or sodium salt	AOAC 973.31 (Codex general method)	Colorimetry	II	
	Tin	AOAC 985.16 (Codex general method)	Atomic absorption spectrophotometry	II	
Chili sauce	pH	NMKL 179 (Codex general method)	Potentiometry	II	306R
		AOAC 981.12 (Codex general method)	Potentiometry	III	
	Fill of containers	CAC/RM 46 (Codex general method)	Weighing	I	

* In CODEDX STAN 228, AOAC 972.25 (codex general method) is Type III for lead for all foods, while NMKL 139 and AOAC 999.11 are Type II for lead applicable to all foods (except fats and oils).

The table below lists methods of analysis which are not labelled as “codex general method” in CODEX STAN 234 but contained in CODEX STAN 228.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Infant formula	Iron	AOAC 999.11 | NMKL 139	AAS after dry ashing	II	72
Milk products	Iron	NMKL 161 / AOAC 999.10	Atomic absorption spectrophotometry	III	280, 290
Butter	Copper	ISO 5738 | IDF 76 AOAC 960.40	Photometry, diethyldithiocarbamate	II	279
Edible casein products	Lead	NMKL 139 (Codex general method) AOAC 999.11	Atomic absorption spectrophotometry	II	290
Edible casein products	Lead	NMKL 161 / AOAC 999.10	Atomic absorption spectrophotometry	III	290
Milk fat Products	Copper	ISO 5738 | IDF 76 AOAC 960.40	Photometry, diethyldithiocarbamate	II	280

The table below lists methods of analysis which are not labelled as Codex general method in CODEX STAN 234 but contained in CODEX STAN 239.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	Sulphur dioxide (additives)	Optimized Monier Williams AOAC 990.28 IFUMA 7A	Titrimetry after distillation	II	247

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		NMKL 132			
Sugars (plantation or mill white sugar)	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	212
Sugars (powdered sugar and powdered dextrose)	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	212
Sugars (raw cane sugar)	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	212
Sugars (soft white sugar and soft brown sugar)	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	212
Sugars (white sugar)	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	212

The table below lists methods of analysis labelled and not labelled as “Codex general method” in CODEX STAN 234 sorted by provisions.

(Copper and Iron)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fats and oils not covered by individual standards	Copper and Iron	AOAC 990.05 ISO 8294 AOCS Ca 18b-91 (Codex general method)	Atomic absorption Spectrophotometry (direct graphite furnace)	II	19
Named Animal Fats	Copper and Iron	AOAC 990.05 ISO 8294 AOCS Ca 18b-91 (Codex general method)	Atomic absorption Spectrophotometry (direct graphite furnace)	II	211
Named Vegetable Oils	Copper and Iron	ISO 8294 AOAC 990.05 AOCS Ca 18b-91	AAS	II	210

(Lead)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fats and Oils (all)	Lead	AOAC 994.02 ISO 12193 (Codex general method)	Atomic absorption spectrophotometry (direct graphite furnace)	II	19, 33, 210, 211, 256

		AOCS Ca 18c-91			
Named Vegetable Oils	Lead	AOAC 994.02 ISO 12193 AOCS Ca 18c-91	Atomic Absorption	II	210
Olive Oils and Olive Pomace Oils	Lead	AOAC 994.02 ISO 12193 AOCS Ca 18c-91	AAS	II	33

(Soluble solids)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	Soluble solids	AOAC 983.17 EN 12143 IFUMA 8 ISO 2173	Indirect by refractometry	I	247
Processed fruits and vegetables	Packing medium Canned berry fruits (raspberry, strawberry)	AOAC 932.12 ISO 2173	Refractometry	I	60, 62
Processed fruits and vegetables	Soluble solids	AOAC 932.12 ISO 2173	Refractometry	I	13, 42, 60, 62, 78, 99, 115, 145, 160, 254
Canned Apple Sauce	Soluble solids	AOAC 932.12 ISO 2173 (Codex general method for processed fruits and vegetables)	Refractometry	I	17
Canned Stone Fruits	Drained weight	AOAC 932.14C ISO 2173*	Gravimetry	I	242
Jams (fruit preserves) and jellies	Soluble solids	ISO 2173 AOAC 932.12	Refractometry	I	296
Harissa	Dry extract – soluble solids	ISO 2173	Refractometry	I	308R

*Notes for CCMAS: ISO 2173 is a method for soluble solids.

(pH)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fish sauce	pH	AOAC 981.12 The pH shall be measured in a sample of fish sauce diluted with water to 1:10 using a pH meter. The dilution of fish sauce is necessary because of the high ionic strength in the undiluted sauce.	electrometry	III	302

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	pH	NMKL 179	Potentiometry	II	247
Processed fruits and vegetables	pH	AOAC 981.12	Potentiometry	III	13, 57, 115, 160, 240, 241, 254
		NMKL 179	Potentiometry	II	
Table olives	pH of brine	NMKL 179 (Codex general method for processed fruits and vegetables)	Potentiometry	II	66
		AOAC 981.12 (Codex general method for processed fruits and vegetables)	Potentiometry	III	
Chili sauce	pH	NMKL 179 (Codex general method)	Potentiometry	II	306R
		AOAC 981.12 (Codex general method)	Potentiometry	III	

(Drained weight)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Processed fruits and vegetables	Drained Weight	AOAC 968.30 (Codex General Method)	Sieving Gravimetry	I	38, 42, 60, 62, 78, 99, 145, 223, 241, 254, 260, 297, 319
Canned Stone Fruits	Drained Weight	AOAC 968.30	Gravimetry	I	242
Pickled cucumbers	Drained Weight	AOAC 968.30	Gravimetry	I	115
Preserved tomatoes	Minimum Drained Weight	AOAC 968.30	Gravimetry (sieving) note: Use a No. 14 screen instead of '7/16' or No. 8	I	13
Table Olives	Drained Weight	AOAC 968.30 (Codex general method for processed fruits and vegetables)	Sieving Gravimetry	I	66

(Sodium chloride / salt)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Margarine	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
Minarine	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
Quick frozen fish sticks (fish fingers) and fish portions - breaded or in batter	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Special foods	Chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
Fruit Juices and Nectars	Chloride	AOAC 971.27 (Codex general method) ISO 3634	Titration	II	
Pickled cucumbers	Salt in brine	AOAC 971.27 (Codex general method)	Potentiometry	II	
Processed tomato concentrates	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
Table olives	Salt in brine	AOAC 971.27 | NMKL 178 (Codex general method)	Potentiometry	II	
Foul medames	Salt content	AOAC 971.27 NMKL 178	Potentiometry	II	
Humus with tehena	Salt content	AOAC 971.27 NMKL 178	Potentiometry	II	

(b) Issues that needs action of CCMAS after clarification by Standard Developing Organisations (SDOs)

(b)-1 Multiple Type I methods for one commodity/provision combination

The methods of analysis in the table below are denoted as Type I while they use different principles.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Chocolate and chocolate products	Moisture	AOAC 977.10 | IOCCC 26	Gravimetry (Karl Fischer method)	I	87
		AOAC 931.04 | IOCCC 26	Gravimetry (Oven method)		
Named Animal Fats	Unsaponifiable matter	ISO 3596	Titrimetry after extraction with diethyl ether	I	211
		ISO 18609	Titrimetry after extraction with hexane		
Milk fat Products (anhydrous milkfat)	Peroxide value	ISO 3976|IDF 74	Photometry	I	280
		AOAC 965.33	Titrimetry	I	
Fermented milks - Yoghurt and yoghurt products	Lactobacillus delbrueckii subsp bulgaricus & Streptococcus thermophilus	ISO 7889 | IDF 117	Colony count at 37°C	I	243
		ISO 9232 | IDF 146	Test for strain identification	I	243

The methods of analysis in the table below are denoted as Type II while they use different principles.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	Chloride in vegetable juice	AOAC 971.27	Potentiometric titration	II	247
		ISO 3634	Colorimetric titration		

The table below shows methods of analysis where multiple methods are adopted as Type I or II but their equivalency is not confirmed yet. Clarification of methods of analysis by SDOs is indispensable for confirmation.

(Type I method)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Degermed maize (corn) meal and maize (corn) grits	Ash	AOAC 923.03 ISO 2171 ICC Method No 104/1	Gravimetry	I	155
Degermed maize (corn) meal and maize (corn) grits	Moisture	ISO 712 ICC Method No 110/1	Gravimetry	I	155
Durum wheat semolina and durum wheat flour	Ash (semolina)	AOAC 923.03 ISO 2171	Gravimetry	I	178
Durum wheat semolina and durum wheat flour	Moisture	ISO 712 ICC 110/1	Gravimetry	I	178
Pearl millet flour	Moisture	ISO 712 ICC 110/1	Gravimetry	I	170
Sorghum flour	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	173
Sorghum flour	Fibre, crude	ICC 113 ISO 6541:1981	Gravimetry	I	173
Sorghum flour	Moisture	ISO 712 ICC 110/1	Gravimetry	I	173
Sorghum grains	Ash	AOAC 923.03 ISO 2171:1993 ICC 104/1	Gravimetry	I	172
Soy protein products	Ash	AOAC 923.03 ISO 2171~~:(Method B)~~	Gravimetry	I	175
Vegetable protein products	Ash	AOAC 923.03 ISO 2171~~:(Method B)~~	Gravimetry	I	174
Wheat flour	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	152

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Wheat flour	Moisture	ISO 712 ICC 110/1	Gravimetry	I	152
Wheat protein products including Wheat gluten	Ash	AOAC 923.03 ISO 2171~~:Method B~~	Gravimetry	I	163
Whole and decorticated pearl millet grains	Moisture	ISO 712 ICC 110/1	Gravimetry	I	169
Whole maize (corn) meal	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	154
Whole maize (corn) meal	Moisture	ISO 712 ICC 110/1	Gravimetry	I	154
Chocolate and chocolate products	Cocoa butter	AOAC 963.15 IOCCC 14	Gravimetry (Soxhlet extraction)	I	87
Chocolate and chocolate products	Milkfat	IOCCC 5 AOAC 945.34; 925.41B; 920.80	Titrimetry/Distillation	I	87
Chocolate and chocolate products	Moisture	IOCCC 26 or AOAC 977.10 (Karl Fischer method); or AOAC 931.04 or IOCCC 1	Gravimetry	I	87
Cocoa (Cacao) Mass or Cocoa/ Chocolate Liquor, and Cocoa Cake	Fat	AOAC 963.15 IOCCC 14	Gravimetry (Soxhlet extraction)	I	141
Cocoa butter	Free fatty acids	ISO 660 AOCS Cd 3d-63	Titrimetry	I	86
Cocoa butter	Unsaponifiable matter	ISO 3596 ISO 18609 AOCS Ca 6b-53	Titrimetry after extraction with diethyl ether	I	86
Cocoa powders (cocoa) and dry cocoa-sugar mixtures	Moisture	IOCCC 26 AOAC 977.10 (Karl Fischer method)	Gravimetry	I	105
Fats and Oils (all)	Soap content	BS 684 Section 2.5 AOCS Cc 17-95	Gravimetry	I	19, 33, 210, 211, 256
Fats and oils not covered	Acid Value	ISO 660	Titrimetry	I	19

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
by individual standards		AOCS Cd 3d-63			
	Peroxide value	AOCS Cd 8b-90	Titrimetry using iso-octane	I	19
		ISO 3960			
Fish oils	Acid value	AOCS Ca 5a-40 AOCS CD 3D-63 ISO 3960 NMKL 38	Titration	I	Adopted at Step 5 by the 38th CAC
Fish oils	Peroxide value	AOCS Cd 8b-90 ISO 3960 NMKL 158	Titration	I	Adopted at Step 5 by the 38th CAC
		European Pharmacopeia 2.5.5 (Part B Iso-octane as solvent)	Titration	I	
Named Animal Fats	Acidity	ISO 660	Titrimetry	I	211
		AOCS Cd 3d-63			
	Iodine value (IV)	ISO 3961; or AOAC 993.20; or	Wijs-Titrimetry	I	211
		AOCS Cd 1d-92			
	Peroxide value	AOCS Cd 8b-90	Titrimetry using iso-octane	I	211
		ISO 3960			
	Saponification value	ISO 3657	Titrimetry	I	211
		AOCS Cd 3-25			
	Unsaponifiable matter	ISO 3596	Titrimetry after extraction with diethyl ether	I	211
		ISO 18609			
		AOCS Ca 6b-53			
	Titre	ISO 935	Thermometry	I	211
		AOCS Cc 12-59			
Named Vegetable Oils	Acidity	ISO 660	Titrimetry	I	210
		AOCS Cd 3d-63			
	Apparent density	ISO 6883, with the appropriate conversion factor	Pycnometry	I	210
		AOCS Cc 10c-95			
	Iodine value (IV)	ISO 3961	Wijs-Titrimetry	I	210

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		AOAC 993.20			
		AOCS Cd 1d-92			
		NMKL 39			
	Peroxide value (PV)	AOCS Cd 8b-90 or ISO 3960	Titrimetry	I	210
	Saponification value	ISO 3657	Titrimetry	I	210
		AOCS Cd 3-25			
	Slip point	ISO 6321 for all oils; AOCS Cc 3b-92 for all oils except palm oils; AOCS Cc 3-25 for palm oils only	Open ended capillary tube	I	210
	Soap content	BS 684 Section 2.5	Gravimetry	I	210
		AOCS Cc 17-95			
	Unsaponifiable matter	ISO 3596	Titrimetry after extraction with diethyl ether	I	210
		ISO 18609			
		AOCS Ca 6b-53			
Olive Oils and Olive Pomace Oils	Acidity, free (acid value)	ISO 660	Titrimetry	I	33
		AOCS Cd 3d-63			
	Iodine value	ISO 3961	Wijs-Titrimetry	I	33
		AOAC 993.20			
		AOCS Cd 1d-92			
		NMKL 39			
	Peroxide value	ISO 3960	Titrimetry using iso-octane	I	33
		AOCS Cd 8b-90			
	Saponification value	ISO 3657	Titrimetry	I	211
		AOCS Cd 3-25			
	Unsaponifiable matter	ISO 3596	Gravimetry	I	211
		ISO 18609			
		AOCS Ca 6b-53			
Infant formula	Total fat	AOAC 989.05	Gravimetry (Röse-Gottlieb)	I	72
		ISO 8381 | IDF 123			

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fruit Juices and Nectars	Soluble solids	AOAC 983.17	Indirect by refractometry	I	247
		EN 12143			
		IFUMA 8			
		ISO 2173			
	Total nitrogen	EN 12135	Digestion/titration	I	247
		IFUMA 28			
	Ash in fruit products	AOAC 940.26	Gravimetry	I	247
		EN 1135			
		IFUMA 9			
	Carotenoid, total/individual groups	EN 12136	Spectrophotometry	I	247
		IFUMA 59			
	Centrifugable pulp	EN 12134	Centrifugation/% value	I	247
		IFUMA 60			
	Essential oils (Scott titration)	AOAC 968.20*	(Scott) distillation, titration	I	247
		IFUMA 45*			
	Formol number	EN 1133	Potentiometric titration	I	247
		IFUMA 30			
	Proline by photometry – non-specific determination	EN 1141	Photometry	I	247
		IFUMA 49			
	Starch	AOAC 925.38	Colorimetric	I	247
		IFUMA 73			
	Titrable acids, total	EN 12147	Titrimetry	I	247
		IFUMA 3			
		ISO 750			
	Total dry matter (vacuum-oven drying at 70°C)	EN 12145*	Gravimetric determination	I	247
		IFUMA 61*			
(Footnote in CODEX STAN 234) * Because there is no numerical value in the Standard duplicate Type I methods have been included which may lead to different results.					
Edible casein products	Ash (including P2O5)	ISO 5545|IDF 90	Gravimetry (ashing at 825 °C)	I	290

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		ISO 5544|IDF 89			
Fermented milks - Yoghurt and yoghurt products	Lactobacillus delbrueckii subsp bulgaricus & Streptococcus thermophilus	ISO 7889 | IDF 117	Colony count at 37°C	I	243
		ISO 9232 | IDF 146	Test for strain identification	I	243
Fermented milks	Milk fat	ISO 1211 | IDF 1	Gravimetry (Röse-Gottlieb)	I	243
		AOAC 989.05			
Milk fat Products (anhydrous milkfat)	Peroxide value	ISO 3976|IDF 74	Photometry	I	280
		AOAC 965.33	Titrimetry	I	280
Processed fruits and vegetables	Packing medium Canned berry fruits (raspberry, strawberry)	AOAC 932.12 ISO 2173	Refractometry	I	60, 62
	Soluble solids	AOAC 932.12 ISO 2173	Refractometry	I	13, 42, 60, 62, 78, 99, 115, 145, 160, 254
Canned Apple Sauce	Soluble solids	AOAC 932.12 ISO 2173 (Codex general method for processed fruits and vegetables)	Refractometry	I	17
Certain Canned Vegetables (palmito)	Mineral impurities (sand)	AOAC 971.33	Gravimetry	I	297
		ISO 762	Gravimetry	I	297
Desiccated coconut	Total acidity of the extracted oil	ISO 660	Titrimetry	I	177
		AOCS Cd 3d-63	Titrimetry	I	177
Jams (fruit preserves) and jellies	Soluble solids	ISO 2173 AOAC 932.12	Refractometry	I	296

Type II

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Chocolate and chocolate products	Fat-free milk solids	IOCCC 17 AOAC 939.02	Titrimetry, Kjeldahl digestion; after extraction of milk proteins	II	87
Fats and oils	Butylhydroxyanisole, butylhydroxytoluene, tert-butylhydroquinone, & propyl gallate	AOAC 983.15	Liquid chromatography	II	19, 33, 210, 211, 256
		AOCS Ce-6-86			

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fats and oils (all)	Lead	AOAC 994.02 ISO 12193 (Codex general method) AOCS Ca 18c-91	Atomic absorption spectrophotometry (direct graphite furnace)	II	19, 33, 210, 211, 256
Named Animal Fats	Refractive index	ISO 6320 AOCS Cc 7-25	Refractometry	II	211
Named Vegetable Oils	GLC ranges of fatty acid composition	ISO 5508 and ISO 12966-2 AOCS Ce 2-66 and Ce 1-62 or Ce 1h-05	Gas chromatography of methyl esters	II	210
	Refractive index	ISO 6320 AOCS Cc 7-25	Refractometry	II	211
	Sterol content	ISO 12228-1 AOCS Ch 6-91	Gas chromatography	II	210
	Tocopherol content	ISO 9936 AOCS Ce 8-89	HPLC	II	210
Olive Oils and Olive Pomace Oils	Absorbency in ultra-violet	COI/T.20/Doc. No19 ISO 3656 AOCS Ch 5-91	Absorption in ultra violet	II	33
	Lead	AOAC 994.02 ISO 12193 AOCS Ca 18c-91	AAS	II	33
	Refractive index	ISO 6320 AOCS Cc 7-25	Refractometry	II	33
	Sterol composition and total sterols	COI/T.20/Doc. no. 10 ISO 12228 AOCS Ch 6-91	Gas chromatography	II	33
	Stigmastadienes	COI/T.20/Doc. no. 11 ISO 15788-1 ISO 15788-1	Gas chromatography	II	33
	Wax content	COI/T.20/Doc. no. 18 AOCS Ch 8-02	Gas chromatography	II	33
Infant formula	Vitamin B_6	AOAC 2004.07 EN 14164	HPLC	II	72

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		(Free and bound phosphorylated forms (pyridoxal, pyridoxine and pyridoxamine) converted and measured as pyridoxine)			
Fruit Juices and Nectars	Glucose-D and fructose-D (permitted ingredients)	EN 1140	Enzymatic determination	II	247
		IFUMA 55			247
	Malic acid-D	EN 12138	Enzymatic determination	II	247
		IFUMA 64			247
	Malic acid-L	EN 1138	Enzymatic determination	II	247
		IFUMA 21			247
	Benzoic acid and its salts; sorbic acid and its salts	IFUMA 63	HPLC	II	247
		NMKL 124			247
	Sucrose (permitted ingredients)	EN 12630	HPLC	II	247
		IFUMA 67			247
		NMKL 148			247
	Sulphur dioxide (additives)	Optimized Monier Williams AOAC 990.28	Titrimetry after distillation	II	247
		IFUMA 7A			247
		NMKL 132			247
	Tartaric acid in grape juice (additives)	EN 12137	HPLC	II	247
		IFUMA 65			247
	Acetic acid	EN 12632;	Enzymatic determination	II	247
		IFUMA 66			
	Chloride in vegetable juice	AOAC 971.27 (Codex general method)	Titration	II	247
		ISO 3634			
	Free amino acids	EN 12742	Liquid Chromatography	II	247
		IFUMA 57			
	Hesperidin and naringin	EN 12148	HPLC	II	247
		IFUMA 58			
	Lactic acid- D and L	EN 12631	Enzymatic determination	II	247
		IFUMA 53			
	Phosphorus/phosphate	EN 1136	Photometric determination	II	247

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
		IFUMA 50			
	Relative density	EN 1131	Pycnometry	II	247
		IFUMA 1 & IFU Method No General sheet (1971)			
	Sodium, potassium, calcium, magnesium in fruit juices	EN 1134	Atomic Absorption Spectroscopy	II	247
		IFUMA 33			
	Stable carbon isotope ratio in the pulp of fruit juices	ENV 13070	Stable isotope mass spectrometry	II	247
		Analytica Chimica Acta 340, Iss 1-3, 1997, 21-29			
	Stable carbon isotope ratio of sugars from fruit juices	ENV 12140	Stable isotope mass spectrometry	II	247
		Analytica Chimica Acta 271, Iss 1, 1993, 31-38			
Milk products	Iron	NMKL 139 (1991)	Atomic absorption spectrophotometry	II	280, 290
		AOAC 999.11 (Codex general method)			
Butter	Copper	ISO 5738|IDF 76:2004	Photometry, diethyldithiocarbamate	II	279
		AOAC 960.40			
Sugars (plantation or mill white sugar)	Sulphur dioxide	ICUMSA GS 2/3-35	Enzymatic method	II	212
		NMKL 135			212
		EN 1988-2			212
Sugars (powdered sugar and powdered dextrose)	Sulphur dioxide	ICUMSA GS 2/3-35	Enzymatic method	II	212
		NMKL 135			212
		EN 1988-2			212
Sugars (raw cane sugar)	Sulphur dioxide	ICUMSA GS 2/3-35	Enzymatic method	II	212
		NMKL 135			212
		EN 1988-2			212
Sugars (soft white sugar and soft brown sugar)	Sulphur dioxide	ICUMSA GS 2/3-35	Enzymatic method	II	212
		NMKL 135			
		EN 1988-2			
Sugars (white sugar)	Sulphur dioxide	ICUMSA GS 2/3-35	Enzymatic method	II	212
		NMKL 135			
		EN 1988-2			
Foul medames	Salt content	AOAC 971.27	Potentiometry	II	258R
		NMKL 178			

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Guidelines for nutrition labelling	Saturated fat	AOAC 996.06 AOCS Ce 1h-05	Gas liquid chromatography	II	GL 2
Humus with tehena	Salt content	AOAC 971.27 NMKL 178	Potentiometry	II	257R

(c) Issues that are rather editorial and format-related.

(c)-1 Conversion factor for the determination of specific provision

The table below lists methods of analysis for protein or nitrogen, which require conversion factors for calculation of the quantity.

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Degermed maize (corn) meal and maize (corn) grits	Protein	ICC Method No 105/1	Titrimetry, Kjeldahl digestion	I	155
Durum wheat semolina and durum wheat flour	Protein (N x 5.7)	ICC 105/1	Titrimetry, Kjeldahl digestion	I	178
Pearl millet flour	Protein	AOAC 920.87	Titrimetry, Kjeldahl digestion	I	170
Sorghum flour	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	173
Sorghum grains	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	172
Soy protein products	Protein	AOAC 955.04D (using factor 6.25)	Titrimetry , Kjeldahl digestion	II	175
Vegetable protein products	Protein	AOAC 955.04D (using factor 6.25)	Titrimetry, Kjeldahl digestion	II	174
Wheat flour	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	152
Wheat protein products including wheat gluten	Protein	Vital wheat gluten and devitalized wheat gluten AOAC 979.09(wheat protein in grain Nx5.7)	Kjeldahl	I	163
		Solubilized wheat protein AOAC 920.87 (wheat protein in flour Nx5.7)	Kjeldahl	I	163
Whole and decorticated pearl millet grains	Protein	AOAC 920.87	Titrimetry, Kjeldahl digestion	I	169
Whole maize (corn) meal	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	154
Fish Sauce	total nitrogen	AOAC 940.25	digestion	I*	302
	amino acid nitrogen	AOAC 920.04 and AOAC 920.03	determining formaldehyde titration method subtracting by ammoniacal nitrogen (magnesium oxide	I*	302

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
			method)		
Special foods	Protein, crude	Method described in CAC/VOL IX-Ed. 1, Part III	Titrimetry, Kjeldahl digestion	I	74, ,181, ,203
Infant formula	Crude protein[8]	ISO 8968-1/2 | IDF 20-1/2	Titrimetry (Kjeldahl)	I	72
(Footnote in CODEX STAN 234) [8] Determination of Crude Protein The calculation of the protein content of infant formulas prepared ready for consumption may be based on N x 6.25, unless a scientific justification is provided for the use of a different conversion factor for a particular product. The value of 6.38 is generally established as a specific factor appropriate for conversion of nitrogen to protein in other milk products, and the value of 5.71 as a specific factor for conversion of nitrogen to protein in other soy products					
Fruit Juices and Nectars	Total nitrogen	EN 12135	Digestion/titration	I*	247
		IFUMA 28	Digestion/titration	I*	247
Blend of evaporated skimmed milk and vegetable fat	Milk protein in MSNF	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	IV	250
		AOAC 991.20	Titrimetry (Kjeldahl)	IV	250
Reduced fat blend of Evaporated skimmed milk and vegetable fat	Milk protein in MSNF	ISO 8968-1 | IDF 20-1/	Titrimetry (Kjeldahl)	IV	250
		AOAC 991.20	Titrimetry (Kjeldahl)	IV	250
Blend of skimmed milk and vegetable fat in powdered form	Milk protein in MSNF	ISO 8968-1/2|IDF 20-1/2:2001/	Titrimetry (Kjeldahl)	IV	251
		AOAC 991.20	Titrimetry (Kjeldahl)	IV	251
Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	Milk protein in MSNF	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	IV	251
		AOAC 991.20	Titrimetry (Kjeldahl)	IV	251
Blend of sweetened condensed skimmed milk and vegetable fat	Milk protein in MSNF	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	IV	252
		AOAC 991.20	Titrimetry (Kjeldahl)	IV	252
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	Milk protein in MSNF	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	IV	252
		AOAC 991.20	Titrimetry (Kjeldahl)	IV	252
Cheese, Unripened Including	Milk Protein	ISO 8968-1 | IDF 20-1	Titrimetry, Kjeldahl	I	221

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Fresh Cheese					
Cream and Prepared Creams	Milk protein	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	I	288
Edible casein products	Milk Protein (total N x 6.38 in dry matter)	ISO 8968-1 | IDF 20-1	Titrimetry, Kjeldahl	I	290
Evaporated milks	Milk Protein in MSNF	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	I	281
	Milk Protein in MSNF	AOAC 945.48H /	Titrimetry (Kjeldahl)	I	281
	Milk Protein	ISO 8968-1 | IDF 20-1	Titrimetry (Kjeldahl)	I	243
Milk powders and cream powders	Milk Protein (in MSNF)	ISO 8968-1|IDF 20-1	Titrimetry (Kjeldahl digestion)	I	281
Sweetened Condensed Milks	Protein	ISO 8968-1|IDF 20-1	Titrimetry (Kjeldahl)	I	282
Whey powders	Milk protein (total N x 6.38)	ISO 8968-1|IDF 20-1	Titrimetry (Kjeldahl)	I	289
Processed meat and poultry products	Nitrogen/protein	ISO 937	Titrimetry	II	96, 97
Bouillons and Consommés (soups and broths)	Amino nitrogen	AIIBP Method No 2/7	Volumetry (modified Van Slyke)	II	117
Bouillons and Consommés (soups and broths)	Nitrogen, total	AOAC 928.08	Kjeldahl	II	117
Cooked cured ham	Protein (conversion factor 6.25)	ISO 937	Titrimetry	II	96
Cooked cured pork shoulder	Protein	ISO 937	Titrimetry, Kjeldahl digestion	II	97
Fermented Soybean Paste	Total Nitrogen	AOAC 984.13	Kjeldahl	I*	298R
Fermented Soybean Paste	Amino Nitrogen	AOAC 920.154 on the conditions specified in the standard[21]	Volumetry	I*	298R
(Footnote in CODEX STAN 234) [21] Section 9.2 Determination of Amino Nitrogen Preparation of test samples: Weigh 2 g of sample into a 250 ml beaker and mix the sample with 100 ml of cold (15°C) NH3-free H2O and then stir the mixture for 60 min. Next, decant the mixture through a quantitative filter and collect the filtrate in a 100 ml volumetric flask. Endpoint - A pH meter shall be used to determine the endpoint instead of optical verification of colours.					
Gochujang	Crude protein	AOAC 984.13 (Nitrogen conversion factor: 6.25)	Kjeldahl	I	294R

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Non-fermented soybean products	Protein content	NMKL 6 or AACCI 46-16.01 or AOAC 988.05 or AOCS Bc 4-91 or AOCS Ba 4d-90 (Nitrogen factor 5.71)	Titrimetry, Kjeldahl digestion	I	Adopted as a regional std at the 38th CAC
Tehena	Protein content	ISO 1871	Titrimetry, Kjeldahl	I	259R
Tempe	Protein content	NMKL 6 or AOAC 988.05 or AACCI 46-16.01 (Nitrogen factor 5.71)	Titrimetry, Kjeldahl digestion	I	313R

*Notes for CCMAS: Provided that SDOs kindly confirms the methods of analysis for nitrogen content without conversion factor(s) to Protein, these methods of analysis may be assigned Type II.

(c)-3 Methods of analysis for revoked commodity standards

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Margarine	Fat	IUPAC 2.801	Gravimetry	I	32 (revoked)
	Milkfat	CAC/RM 15-1969	Titrimetry	I	
	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
	Vitamin A	AOAC 960.45	Spectrophotometry	II	
	Vitamin D	AOAC 936.14	Bioassay	II	
	Vitamin E	IUPAC 2.411	TLC followed by spectrophotometry or GLC	II	
	Water	CAC/RM 17-1969 (described in the Standard)	Gravimetry	I	
Minarine	Fat	IUPAC 2.801	Gravimetry	I	135 (revoked)
	Milkfat	CAC/RM 15-1969 (described in the Standard)	Titrimetry	I	
	Sodium chloride	AOAC 971.27 (Codex general method)	Potentiometry	II	
	Vitamin A	AOAC 960.45	Spectrophotometry	II	
	Vitamin D	AOAC 936.14	Bioassay	II	
	Vitamin E	IUPAC 2.411	TLC followed by spectrophotometry or GLC	II	
	Water	CAC/RM 17-1969	Gravimetry	I	

Notes for CCMAS: Standard for Fat Spreads and Blended Spreads (CODEX STAN 256) currently covers margarine and minarine; however, provisions for margarine and minarine in CODEX STAN 234 are not specified in CODEX STAN 256 except fat content.

(c)-4 Methods of analysis that are no longer available/accessible (e.g. ex-RM methods)

(RM numbering system)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Soy protein products	Fat	CAC/RM 55 - Method 1	Gravimetry (extraction)	I	175
Vegetable protein products	Fat	CAC/RM 55 - Method 1	Gravimetry (extraction)	I	174
Margarine	Milkfat	CAC/RM 15	Titrimetry	I	NA
Margarine	Water	CAC/RM 17 (described in the Standard)	Gravimetry	I	NA
Minarine	Milkfat	CAC/RM 15 (described in the Standard)	Titrimetry	I	NA

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Minarine	Water	CAC/RM 17	Gravimetry	I	NA
Special foods	Fat	CAC/RM 55	Gravimetry (extraction)	I	181, 203
Special foods	Fat in foods not containing starch, meat or vegetable products	CAC/RM 1, B-2	Gravimetry	I	NA
Special foods	Fill of containers	CAC/RM 46	Weighing	I	73, 181, 203
Processed fruits and vegetables	Fill of containers	CAC/RM 46 (reference to “metal containers” deleted and refer to ISO 90-1 for determination of water capacity in metal containers)	Weighing	I	13, 38, 42, 57, 60, 62, 78, 99, 115, 145, 240, 241, 242, 254, 260, 297, 319
Canned Apple Sauce	Fill of containers	CAC/RM 46 (for glass containers) (Codex general method for processed fruits and vegetables) and ISO 90-1.1 (for metal containers) (Codex general method for processed fruits and vegetables)	Weighing	I	17
Canned green beans and wax beans	Tough strings	CAC/RM 39	Stretching	I	297
Canned green peas	Proper fill (in lieu of drained weight)	CAC/RM 45	Pouring and measuring	I	297
Canned green peas	Types of peas, distinguishing	CAC/RM 48	Visual inspection	I	297
Canned mushrooms	Washed drained weight	CAC/RM 44	Sieving	I	297
Jams (fruit preserves) and jellies	Fill of Containers	CAC/RM 46	Weighing	I	296
Raisins	Mineral impurities	CAC/RM 51	Ashing	I	67
Raisins	Mineral oil	CAC/RM 52	Extraction and separation on alumina	II	67
Table olives	Fill of containers	CAC/RM 46 (for glass containers) (Codex general method for processed fruits and vegetables) and ISO 90-1.1 (for metal containers) (Codex general method for processed fruits and vegetables)	Weighing	I	66
Quick frozen fruits and vegetables	Net weight	CAC/RM 34	Weighing	I	NA
Quick frozen fruits and vegetables	Thawing procedure	CAC/RM 32	Thawing	I	NA
Quick frozen fruits and vegetables: Berries, leek and carrot	Mineral impurities	CAC/RM 54	Flotation and sedimentation	I	52, 69, 76, 77, 103, 320

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Quick frozen fruits and vegetables: Berries, Whole kernel corn and Corn-on-the-cob	Soluble solids, total	CAC/RM 43	Refractometry	I	52, 69, 75, 76, 103
Quick frozen fruits and vegetables: Vegetables	Cooking procedure	CAC/RM 33	Cooking	I	NA
Quick frozen green and wax beans	Tough strings	CAC/RM 39	Stretching	I	113
Quick frozen peas	Solids, alcohol insoluble	CAC/RM 35	Gravimetry	I	41
Chili sauce	Fill of containers	CAC/RM 46 (Codex general method)	Weighing	I	306R

(Others)

Commodity	*Provision*	*Method*	*Principle*	*Type*	*CODEX STAN*
Special foods	Calories by calculation	Method described in CAC/VOL IX-Ed.1, Part III	Calculation method	III	
Special foods	Carbohydrates	Method described in CAC/VOL IX-Ed.1, Part III	Calculation	III	
Special foods	Protein, crude	Method described in CAC/VOL IX-Ed.1, Part III	Titrimetry, Kjeldahl digestion	I	
Infant formula	Calories (by calculation)	Method described in CAC/Vol IX-Ed.1, Part III[7]	Calculation	I	

(Footnote in CODEX STAN 234)

[7] Section 9. Calories by calculation – Section 9.2 Conversion Factors

(a) protein 4 kcal per g

(b) carbohydrate 4 kcal per g

(c) fat 9 kcal per g

(d) monosaccharides 3.75 kcal per g

(e) specific food ingredients See “Energy and Protein Requirements”(FAO Nutrition Meeting Report Series No. 52 or WHO Technical Report Series No. 522)

(f) other specific calorie conversion factors may be used where the formulation of the food and the nutrient content are known and where such specific conversion factors are physiologically more meaningful than the factors listed above