

# CODEX ALIMENTARIUS COMMISSION

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Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

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Agenda Item 6

CX/MAS 17/38/6

March 2017

## JOINT FAO/WHO FOOD STANDARDS PROGRAMME

### CODEX COMMITTEE ON METHODS OF ANALYSIS SAMPLING

Thirty-eighth Session

Budapest, Hungary, 8 - 12 May 2017

#### DISCUSSION PAPER ON THE REVIEW OF CODEX STAN 234-1999

(Prepared by the Electronic Working Group led by Brazil and Uruguay)

#### BACKGROUND:

At its last session CCMAS agreed to continue to work on the review and update of CODEX STAN 234-1999 by means of an eWG chaired by Brazil and co-chaired by Uruguay to:

- a. Continue working on the review and update of CODEX STAN 234-1999 to prepare workable packages to send to Codex secretariat in order to be considered by the PWG on endorsement;
- b. to make a recommendation on how to deal with the term "codex general methods";
- c. to draft a preamble for CODEX STAN 234-1999.

Appendices I and II cover points "b" and "c" aiming to draft a proposal for the preamble for CODEX STAN 234-1999 and to develop recommendation about how to deal with the term "codex general methods". The first methods of analyses workable packages are in Appendix III.

Brazil focused its work on the preamble, the format of the standard and the workable packages and Uruguay on the "Codex general Methods".

Comments were received from Argentina, Australia, Chile, Germany, Iran, Jamaica, Japan, Switzerland, Thailand, International Dairy Federation and International Fruit and Vegetable Juice Association. The complete list of participants is in Appendix IV.

Brazil and Uruguay want to express their gratitude to all members for their interest and for active contributions.

#### Main issues discussed in the eWG

The proposed structure for the CODEX STAN 234 (Appendix I) was made based on previous discussions.

As highlighted by the eWG in the last session of CCMAS, there are many ways to mention the same provision and principle for the same method and it is advisable to harmonize them. To address the issue a harmonized list of provisions and principles was included to be assessed by the Committee. The eWG recognized the importance to have a harmonized list of provisions and principles that can be used by CCMAS and Committees, but some Members are of the opinion that it could be future work.

One Member suggested to delete the sentence regarding the possibility of the use of methods Type III and IV in cases of disputes, according to the *Guidelines for Settling Disputes on Analytical (Test) Results* (CAC/GL 70-2009). The sentence was kept because it reflects the CCMAS decision (REP15/MAS paragraphs 52 and 56)

Regarding “Codex general methods”, the eWG supports the inclusion of those methods from other standards into CODEX STAN 234, but it might be necessary for CCMAS to revise them in the future as a workable package to determine their applicability. There was a general agreement that the expression “Codex general method” shall be used to classify those methods applied horizontally to measure one or more provisions on several types of commodities and presented performance figures fit for purpose. The decision whether a method should be given or retained as “Codex general method” status needs to be based on its general applicability and easy adaptability to a large range of commodities, and allow to identify methods that are preferable over other methods that apply to individual commodities as long as both methods are fit for purpose, in line with the *General Criteria for the Selection of Methods of Analysis* described in Codex Procedure Manual. Generally, the term “all Food methods” is recommended to be used only when the matrix is destroyed at levels that do not interfere on performance criteria. The eWG participants agree that all methods need to be validated in each specific matrix or group of matrices if robustness test are done to demonstrate its applicability. In order to grant visibility about scope, a list of all commodities validated shall be provided with method description.

A summary is presented in Appendix 2 with comments related with this discussion.

### **RECOMMENDATIONS:**

The Committee is invited to consider:

- the proposed draft version of CODEX STAN 234 presented in Appendix I;
- if it is necessary to establish a specific eWG to discuss criteria to apply to “General Codex Methods/all food methods” and/or the possibility to revise these methods as a workable package;
- the importance to harmonize the list of commodities, provisions and principles of the methods as a new work taking the Annex 1, 2 and 3 of the Appendix I as a starting point;
- the actions suggested for each workable packages in Appendix III.

**DRAFT GENERAL STANDARD ON  
RECOMMENDED METHODS OF ANALYSIS AND SAMPLING (CODEX STAN 234-1999)**

(for comment through [CL 2017/4-MAS](#))

## INTRODUCTION

This Standard is intended to provide a single reference to competent national and/or regional authorities to select methods of analysis and sampling, as appropriate for their purpose, which are recommended by the *Codex Alimentarius* Commission.

For the actual use of the methods covered by the Standard, it is recommended that this Standard should be read in conjunction with the related commodity standards, *Harmonized IUPAC Guidelines for the Use of Recovery Information in Analytical Measurement* (CAC/GL 37-2001), *Harmonized IUPAC Guidelines for Single-Laboratory Validation of Methods of Analysis* (CAC/GL 49-2003), *Guidelines on Sampling* (CAC/GL 50-2004), *Guidelines on Measurement Uncertainty* (CAC/GL 54-2004), *Protocol for the Design, Conduct and Interpretation of Method Performance Studies* (CAC/GL 64-1995), *Harmonized Guidelines for Internal Quality Control in Analytical Chemistry Laboratories* (CAC/GL 65-1997) and other Codex relevant documents.

In case of disputes of analytical results, guidance is given in the *Guidelines for Settling Disputes over Analytical (Test) Results* (CAC/GL 70-2009), which among others, include guidance on the use of methods of analysis.

The methods are primarily intended as international methods for the verification of provisions in Codex standards. They should be used for reference, in calibration of methods in use or introduced for routine examination and control purposes.

Methods listed in the Section II could be used for any purpose in line with the Principles of this standard and the Procedural Manual. They could be used for national regulation, control and inspection. Methods Type III and IV can also be used in cases of disputes, if it was agreed between the respective competent authorities, according to the *Guidelines for Settling Disputes on Analytical (Test) Results* (CAC/GL 70-2009).

This Standard consists of three main parts and 3 annexes:

### I. PREAMBLE

### II. RECOMMENDED METHODS OF ANALYSIS

#### SECTION I - METHODS OF ANALYSIS BY COMMODITY CATEGORIES AND NAMES

#### SECTION II- CODEX GENERAL METHODS

#### SECTION III - METHODS PERFORMANCE CRITERIA

#### SECTION IV- METHODS DESCRIBED

### III. METHODS OF SAMPLING BY COMMODITY CATEGORIES AND NAMES

#### Annex 1: LIST OF COMMODITIES CATEGORIES AND NAMES

#### Annex 2: LIST OF PROVISIONS

#### Annex 3: LIST OF THE PRINCIPLES OF THE METHODS

## PART I - PREAMBLE

### 1. Scope

This Standard contains definitions, lists of methods of analysis, methods performance criteria, description of method and sampling which are recommended by the Codex Alimentarius Commission (CAC) to verify the provisions in Codex standards to be applied to commodities moving in international trade.

### 2. Definition of Terms

**2.1 Codex Method of Analysis-** methods for the verification of provisions in Codex standards. The methods are classified as Defining Methods (Type I), Reference Methods (Type II), Alternative Approved Methods (Type III), & Tentative Methods (Type IV), these are explained in Codex Procedural Manual – Principles for the Establishment of Codex Methods of Analysis.

**2.2 Codex General Method-** a method which is applicable uniformly to various groups of commodities and presents performance figures fitted for purposed.

**[2.3 Principle-** Phenomenon serving as a basis of a measurement **OR 2.3 Method of analysis – Principle:** The scientific basis of the method of analysis, described concisely, focusing on the technique]

**2.4 Provision in STAN 234** – a measurand or analyte being verified by analysis to determine compliance to a codex standard. Alternatively, a quality criterion of a commodity, with acceptance limits specified by the standard, which need to be confirmed by analysis for the commodity to comply with that standard.

## PART II - RECOMMENDED METHODS OF ANALYSIS

This part contains 3 sections depending on how the methodologies are proposed, endorsed and approved by CAC:

1. **Standardized methods:** this section contains the name of the commodity, the provision to which the methods apply, Codex Standard to which the method is directed, identification of the method Principle of analysis method, Type of analytical method, the year of endorsement by CCMAS and the Codex Committee responsible for the Standard and/or provision. When there is no standardized method, the file identification of the method sends to section 2 (codex general methods), section 3 (Method performance criteria) or section 4 (Complete description of the method of analysis)
2. **Codex General Methods:** this section contains the provision to which the methods apply, Codex Standards to which the method is directed, identification of the method, Principle of analysis method, Type of analytical method, the year of endorsement by CCMAS, the Codex Committee responsible for the Standard and/or provision List of methods and commodities that the method presents performance figures fitted for purpose.
3. **Method performance criteria required for provision determination:** this section contains the name of the commodity, the provision to which the methods apply, Codex Standard to which the method is directed, minimum applicable range, limit of detection (LOD), limit of quantification (LOQ), RSD<sub>R</sub> (Relative Standard Deviation of Reproducibility), % Recovery, year of endorsement by CCMAS and the Codex Committee responsible for the Standard and/or provision. Suggested methods that meet the criteria and their principles also can be mentioned. However, any method which complies with the established performance criteria can be used.
4. **Complete description of the method of analysis:** this section contains the name of the commodity, the provision to which the methods apply, Codex Standard to which the method is directed, year of endorsement by CAC, the Codex Committee responsible for the Standard and/or provision and a description of the method.

## SECTION I - METHODS OF ANALYSIS BY COMMODITY CATEGORIES AND NAMES

The most updated version of the method should be used, as required by ISO/IEC 17025 unless it is not appropriate or possible to do so.

Each line of the standardized methods list corresponds to one method of analysis or more than one if they are necessary to reach a result, in this case they are called complementary. When the methods are in the same line separated by a vertical bar “|” they are considered identical or by a forward slash “/” when they are considered complementary. Equivalent methods are listed in different lines.

**EXAMPLE:** (to be deleted after discussion)

Commodity	Provision	Codex Stan	Method	Principle	Type	Year of Endorsement	Committee
Special foods	Sodium	67-1987	ISOXYZ	AAS	II	1987	CCNFSDU
Moisture	margarine	32-1981	See section III	gravimetry	III	1969	CCFO

Commodity	Provision	Codex Stan	Method	Principle	Type	Year of Endorsement	Committee
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## SECTION II- CODEX GENERAL METHODS

Provision	Codex Stan	Method	Principle	Type	Year of Endorsement	Committee	Commodities
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**SECTION III - METHODS PERFORMANCE CRITERIA**

Commodity	Provision	Applicable CODEX STAN	Minimum applicable range	LO D	LO Q	RSDR(%)	Recovery	Applicable methods that meet the criteria	Principle	Year of Endorsement	Committee
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**SECTION IV- METHODS DESCRIBED**

Commodity	Provision	Applicable Codex Stan	Year of Endorsement	Committee
<b>DESCRIPTION OF THE METHOD:</b>				

**PART III- METHODS OF SAMPLING BY COMMODITY CATEGORIES AND NAMES**

Commodity Categories	Method of Sampling	Notes
Cereals, Pulses and Legumes and Derived Products		
Wheat protein products including wheat gluten	ISO 13690	
Fats and Oils		
Olive Oils and Olive-Pomace Oils	ISO 661 and ISO 5555.	
Fish oils	ISO 5555	
Milk and milk products	ISO 707   IDF 50	General instructions for obtaining a sample from a bulk
	ISO 5538   IDF 113	Inspection by attributes
	ISO 3951-1	Inspection by variables
Processed Fruits and Vegetables		
Desiccated coconut	Described in the Standard	
Certain canned vegetables, jams and jellies	Described in the Standard	
Chili sauce	Described in the Standard	
Table Olives	Described in the Standard	

**Annex 1: LIST OF COMMODITIES CATEGORIES AND NAMES**

The list of commodities is hierarchical, meaning that when a method of analyses is recognized for use in a general category, it is recognized for use in all its sub-categories, unless otherwise stated.

1. Fruits and Vegetables
  - 1.1. Canned Fruits and Vegetables
    - 1.1.1. Pineapple
    - 1.1.2. Raspberries
    - 1.1.3. Strawberries
    - 1.1.4. Stone Fruits
    - 1.1.5. Certain Citrus Fruits
    - 1.1.6. Bamboo Shoots

- 1.1.7. Certain Vegetables
- 1.1.8. Humus with Tehena
- 1.1.9. Foul Medames
- 1.2. Canned Fruits Products
  - 1.2.1. Apple Juice
  - 1.2.2. Tropical Fruit Salad
  - 1.2.3. Fruit Cocktail
  - 1.2.4. Chestnut Purée
- 1.3. Quick Frozen Fruits and Vegetables
  - 1.3.1. Strawberries
  - 1.3.2. Peaches
  - 1.3.3. Raspberries
  - 1.3.4. Bilberries
  - 1.3.5. Blueberries
  - 1.3.6. Peas
  - 1.3.7. Spinach
  - 1.3.8. Broccoli
  - 1.3.9. Cauliflower
  - 1.3.10. Brussels Sprouts
  - 1.3.11. Green Was Beans
  - 1.3.12. French Fried Potatoes
- 1.4. Dehydrated/ Desiccated Fruit and Vegetables
  - 1.4.1. Coconut
  - 1.4.2. Raisins
  - 1.4.3. Dates
  - 1.4.4. Apricots
  - 1.4.5. Dehydrated Edible Fungi
- 1.5. Nuts, Tree Nuts and Ground Nuts
  - 1.5.1. Pistachio
  - 1.5.2. Chestnuts
  - 1.5.3. Peanuts
- 1.6. Other Processed fruits and vegetables
  - 1.6.1. Vegetables
    - 1.6.1.1. Kimchi
    - 1.6.1.2. Ginseng
    - 1.6.1.3. Olives
    - 1.6.1.4. Aqueous Coconut Products (Coconut Milk, Coconut Cream)
    - 1.6.1.5. Mango Chutney
- 1.7. Fresh Vegetables
  - 1.7.1. Fresh Fungus "Chanterelle"
  - 1.7.2. Culantro Coyote (LAC)

- 1.7.3. Tahena
- 1.7.4. Lucuma
2. Processed Meat and Poultry products
  - 2.1. Fresh meat, poultry, and game
  - 2.2. Fresh meat, poultry and game, whole pieces or cuts
  - 2.3. Fresh meat, poultry and game, comminuted
  - 2.4. Processed meat, poultry, and game products in whole pieces or cuts
    - 2.4.1. Non-heat treated processed meat, poultry, and game products in whole pieces or cuts
      - 2.4.1.1. Cured (including salted) non-heat treated processed meat, poultry, and game products in whole pieces or cuts
      - 2.4.1.2. Fermented non-heat treated processed meat, poultry, and game products in whole pieces or cuts
    - 2.4.2. Heat-treated processed meat, poultry, and game products in whole pieces or cuts
    - 2.4.3. Frozen processed meat, poultry and game products in whole pieces or cuts
  - 2.5. Processed comminuted meat, poultry, and game products
    - 2.5.1. Non-heat treated processed comminuted meat, poultry, and game products
      - 2.5.1.1. Cured (including salted) non-heat treated processed comminuted meat, poultry, and game products
      - 2.5.1.2. Fermented non-heat treated processed comminuted meat, poultry, and game products
    - 2.5.2. Heat-treated processed comminuted meat, poultry, and game products
    - 2.5.3. Frozen processed comminuted meat, poultry, and game products
3. Foodstuffs intended for particular nutritional uses
  - 3.1. Infant formulae, follow-on formulae, and formulae for special medical purposes for infants
  - 3.2. Complementary foods for infants and young children
  - 3.3. Dietetic formulae for slimming purposes and weight reduction
  - 3.4. Special Dietary Foods
    - 3.4.1. Gluten-free foods
    - 3.4.2. Low Sodium Content
  - 3.5. Foods for special medical purpose
4. Sugars and Sweeteners, including honey
  - 4.1. Refined and raw sugars
    - 4.1.1. White sugar
    - 4.1.2. Dextrose anhydrous
    - 4.1.3. Dextrose monohydrate
    - 4.1.4. Fructose (laevulose)
    - 4.1.5. Powdered sugar (icing sugar)
    - 4.1.6. Powdered dextrose (icing dextrose)
    - 4.1.7. Soft white sugar
    - 4.1.8. Soft brown sugar
    - 4.1.9. Glucose syrup
    - 4.1.10. Dried glucose syrup
    - 4.1.11. Raw cane sugar
    - 4.1.12. Dried glucose syrup used to manufacture sugar confectionery

- 4.1.13. Glucose syrup used to manufacture sugar confectionery
- 4.1.14. Lactose
- 4.1.15. Plantation or mill white sugar
- 4.1.16. Demerara sugar
- 4.2. Sugar solutions and syrups, also (partially) inverted, including treacle and molasses
  - 4.2.1. Treacle
  - 4.2.2. Molasses
  - 4.2.3. Invert sugar
  - 4.2.4. High fructose corn syrup
  - 4.2.5. High fructose inulin syrup
  - 4.2.6. Corn sugar.
  - 4.2.7. Xylose
  - 4.2.8. Maple syrup
  - 4.2.9. Caramel syrup
  - 4.2.10. Flavored syrups
  - 4.2.11. Decorative sugar toppings
  - 4.2.12. Colored sugar crystals for cookies
- 4.3. Honey
  - 4.3.1. Blossom Honey or Nectar honey
  - 4.3.2. Honeydew honey
- 4.4. Table-top sweeteners, including those containing high-intensity sweeteners
  - 4.4.1. Acesulfame potassium
  - 4.4.2. Sorbitol
- 5. Vegetable Proteins
  - 5.1. Wheat Protein Products
    - 5.1.1. Vital wheat gluten
    - 5.1.2. Devitalized wheat gluten or devital wheat gluten
    - 5.1.3. Solubilized wheat protein or soluble wheat protein
    - 5.1.4. Vegetable protein products
  - 5.2. Soy protein products
    - 5.2.1. Soy protein flour
    - 5.2.2. Soy protein concéntrate
    - 5.2.3. Soy protein isolate
- 6. Cereals, Pulses and Legumes
  - 6.1. Whole, broken, or flaked grain
    - 6.1.1. Maize Corn
    - 6.1.2. Whole maize corn meal
    - 6.1.3. Degermed maize (corn) meal
    - 6.1.4. Degermed maize (corn) grits
    - 6.1.5. Whole pearl millet grains
    - 6.1.6. Decorticated pearl millet grains



- 6.1.7. Whole, shelled or split pulses
- 6.1.8. Whole sorghum grains
- 6.1.9. Decorticated sorghum grains
- 6.1.10. Wheat
- 6.1.11. Durum wheat
- 6.1.12. Peanuts
- 6.1.13. Oats
- 6.1.14. Couscous
- 6.1.15. Rice
- 6.1.16. Paddy rice
- 6.1.17. Husked rice
- 6.1.18. Milled rice
- 6.1.19. Parboiled rice
- 6.1.20. Glutinous rice
- 6.1.21. Waxy rice
- 6.2. Flours and starches
  - 6.2.1. Flours
    - 6.2.1.1. Gari
    - 6.2.1.2. Wheat flour
    - 6.2.1.3. Pearl millet flour
    - 6.2.1.4. Sourghum flour
    - 6.2.1.5. Edible cassava flour
    - 6.2.1.6. Durum wheat semolina
    - 6.2.1.7. Durum wheat flour
    - 6.2.1.8. Edible sago flour
  - 6.2.2. Starches
- 6.3. Breakfast cereals
- 6.4. Pastas and noodles and like products
  - 6.4.1. Fresh pastas and noodles and like products
  - 6.4.2. Dried pastas and noodles and like products
  - 6.4.3. Pre-cooked pastas and noodles and like products
    - 6.4.3.1. Fried noodles
    - 6.4.3.2. Non- fried noodles
- 6.5. Cereal and starch based desserts
- 6.6. Batters
- 6.7. Pre-cooked or processed rice products, including rice cakes (Oriental type only)
- 6.8. Soybean products
  - 6.8.1. Soybean-based beverages
    - 6.8.1.1. Plain soybean beverage
    - 6.8.1.2. Composite/flavored soybean beverage
    - 6.8.1.3. Soybean-based beverages

- 6.8.2. Soybean-based beverage film
  - 6.8.3. Soybean curd (tofu)
  - 6.8.4. Semi-dehydrated soybean curd
    - 6.8.4.1. Thick gravy-stewed semi-dehydrated soybean curd
    - 6.8.4.2. Deep fried semi-dehydrated soybean curd
    - 6.8.4.3. Semi-dehydrated soybean curd
  - 6.8.5. Dehydrated soybean curd (kori tofu)
    - 6.8.5.1. Dehydrated soybean curd film
  - 6.8.6. Fermented soybeans (e.g. natto, tempe)
    - 6.8.6.1. Fermented soybean paste
    - 6.8.6.2. Tempe
  - 6.8.7. Fermented soybean curd
    - 6.8.7.1. Soybean curd
    - 6.8.7.2. Semisolid soybean
    - 6.8.7.3. Compressed soybean curd
  - 6.8.8. Other soybean protein products
7. Fats and Oils
- 7.1. Fats and oils, and fat emulsions
    - 7.1.1. Fats and oils essentially free from water
      - 7.1.1.1. Butter oil, anhydrous milkfat, ghee
      - 7.1.1.2. Vegetable oils and fats
      - 7.1.1.3. Lard, tallow, fish oil, and other animal fats
    - 7.1.2. Fat emulsions mainly of type water-in-oil
      - 7.1.2.1. Butter
      - 7.1.2.2. Fat spreads, dairy fat spreads and blended spreads
    - 7.1.3. Fat emulsions mainly of type oil-in-water, including mixed and/or flavoured products based on fat emulsions
    - 7.1.4. Fat-based desserts excluding dairy-based dessert products of food category 8.4.7.
  - 7.2. Edible ices, including sherbet and sorbet
8. Milk and Milk Products
- 8.1. Fluid, Cream and Milk Powder
    - 8.1.1. Fermented Milk
    - 8.1.2. Whole Milk Powder
    - 8.1.3. Partly Skimmed Powder
    - 8.1.4. Skimmed Milk Powder
    - 8.1.5. Cream Powder
    - 8.1.6. Half Cream Powder
    - 8.1.7. High Fat Cream Powder
  - 8.2. Cream and Prepared Creams
    - 8.2.1. Cream
    - 8.2.2. Reconstituted cream
    - 8.2.3. Recombined cream

- 8.2.4. Prepared creams
- 8.2.5. Prepackaged liquid cream
- 8.2.6. Whipping cream
- 8.2.7. Cream packed under pressure
- 8.2.8. Whipped cream
- 8.2.9. Fermented cream
- 8.2.10. Acidified cream
- 8.3. Cheese
  - 8.3.1. Unripened Cheese
    - 8.3.1.1. Mozzarella
    - 8.3.1.2. Cottage
    - 8.3.1.3. Cream Cheese
    - 8.3.1.4. Extra Hard Grating Cheese
  - 8.3.2. Ripened Cheese
    - 8.3.2.1. Cheddar
    - 8.3.2.2. Danbo
    - 8.3.2.3. Edam
    - 8.3.2.4. Gouda
    - 8.3.2.5. Havarti
    - 8.3.2.6. Samso
    - 8.3.2.7. Emmental
    - 8.3.2.8. Tilsiter
    - 8.3.2.9. Saint Paulin
    - 8.3.2.10. Provolone
    - 8.3.2.11. Coulmmiers
    - 8.3.2.12. Camembert
    - 8.3.2.13. Brie
  - 8.3.3. Whey Cheese
- 8.4. Milk Fractions and Dairy Products
  - 8.4.1.1. Edible acid casein
  - 8.4.1.2. Edible rennet casein
  - 8.4.1.3. Edible caseinate
  - 8.4.1.4. Whey
  - 8.4.1.5. Acid whey
  - 8.4.2. Evaporated Skimmed Milk and Vegetable Fat
  - 8.4.3. Skimmed Milk and Vegetable Fat in Powdered Form
  - 8.4.4. Skimmed Milk and Vegetable Fat
  - 8.4.5. Dairy Fat spread
- 8.5. Milkfat Products
  - 8.5.1. Butter
  - 8.5.2. Anhydrous Milkfat

- 8.5.3. Milkfat
- 8.5.4. Anhydrous butteroil
- 8.5.5. Butteroil
- 8.5.6. Ghee
- 9. Cocoa Products and Chocolate
  - 9.1. Cocoa Butter
  - 9.2. Chocolate and Chocolate Products
    - 9.2.1. Chocolate
    - 9.2.2. Sweet Chocolate
    - 9.2.3. Couverture Chocolate
    - 9.2.4. Milk Chocolate
    - 9.2.5. Family Milk Chocolate
    - 9.2.6. Milk Chocolate Couverture
    - 9.2.7. White Chocolate
    - 9.2.8. Gianduja Chocolate
    - 9.2.9. Gianduja Milk Chocolate
    - 9.2.10. Chocolate para Mesa
    - 9.2.11. Semi-bitter chocolate para Mesa
    - 9.2.12. Bitter chocolate para MESA
    - 9.2.13. Chocolate Vermicelli and Chocolate Flakes
    - 9.2.14. Chocolate Vermicelli and Milk Chocolate Flakes
    - 9.2.15. Filled Chocolate
    - 9.2.16. Praline
  - 9.3. Cocoa Powders
    - 9.3.1. Cocoa Powder
    - 9.3.2. Fat Reduced Cocoa Powder
    - 9.3.3. Highly Fat-Reduced Cocoa Powder
    - 9.3.4. Chocolate Powder
  - 9.4. Cocoa
    - 9.4.1. Cocoa
    - 9.4.2. Mass
    - 9.4.3. Cocoa cake
- 10. Fish and Fishery Products
  - 10.1. Canned Salmon
  - 10.2. Quick Frozen Finfish, Uneviscerated And Eviscerated
  - 10.3. Canned Shrimps or Prawns
  - 10.4. Canned Tuna and Bonito
  - 10.5. Canned Crab Meat
  - 10.6. Quick Frozen Shrimps or Prawns
  - 10.7. Canned Sardines and Sardine-Type Products
  - 10.8. Quick Frozen Lobsters

- 10.8.1. Lobster
- 10.8.2. Rock Lobster, Spiny Lobster or Crawfish
- 10.8.3. Slipper Lobster, Bay Lobster or Sand Lobster
- 10.8.4. Norway Lobster
- 10.8.5. Squat Lobster
- 10.9. Canned Finfish
- 10.10. Quick Frozen Blocks of Fish Fillet, Minced Fish Flesh and Mixtures of Fillets And Minced Fish Flesh
- 10.11. Quick Frozen Fish Sticks (Fish Fingers), Fish Portions and Fish Fillets - Breaded Or In Batter
- 10.12. Salted Fish And Dried Salted Fish of The Gadidae Family of Fishes
- 10.13. Dried Shark Fins
- 10.14. Quick Frozen Fish Fillets
- 10.15. Quick Frozen Raw Squid
- 10.16. Crackers from Marine and Freshwater Fish, Crustacean and Molluscan Shellfish
- 10.17. Boiled Dried Salted Anchovies
- 10.18. Salted Atlantic Herring and Salted Sprat
  - 10.18.1. Very Lightly Salted Fish
  - 10.18.2. Lightly Salted Fish
  - 10.18.3. Medium Salted Fish
- 10.19. Heavily Salted Fish
- 10.20. Sturgeon Caviar
- 10.21. Live and Raw Bivalve Molluscs
- 10.22. Fish Sauce
- 10.23. Smoked Fish, Smoke-Flavoured Fish and Smoke-Dried Fish
  - 10.23.1. Smoked Fish
  - 10.23.2. Smoked Flavoured Fish
  - 10.23.3. Smoked-Dried Fish
- 10.24. Live Abalone and for Raw Fresh Chilled or Frozen Abalone for Direct Consumption or for Further Processing
- 10.25. Live Abalone
- 10.26. Raw Fresh Chilled or Frozen Abalone
- 10.27. Fresh And Quick Frozen Raw Scallop Products
- 10.28. Scallop Meat
- 10.29. Roe-On Scallop Meat
- 10.30. Quick Frozen Scallop Meat
- 10.31. Quick Frozen Roe-On Scallop Meat
11. Natural Mineral Waters
  - 11.1. Naturally carbonated natural mineral water
  - 11.2. Non-carbonated natural mineral water
  - 11.3. Decarbo nated natural mineral water
  - 11.4. Natural mineral water fortified with carbon dioxide from the source
  - 11.5. Carbonated natural mineral water

12. Soups and Broths
  - 12.1. Meat bouillon
  - 12.2. Beef bouillon
  - 12.3. Meat consommé
  - 12.4. Beef consommé
  - 12.5. Poultry bouillon
  - 12.6. Bouillon

## Annex 2: LIST OF PROVISIONS

Provision in CODEX STAN 234	Provision suggested
(1→3)(1→4) Beta -D-Glucans	Beta-D-Glucans
Absorbency in ultraviolet	Absorbance
Acesulfame K, Aspartame	Acesulfame K
	Aspartame
Acetic acid (Sections 3.2 Quality criteria and 3.3 Authenticity)	Acetic acid
Acid Insoluble Ash	Ash, insoluble
Acid Soluble Ash	Ash, soluble
Acid Value	Acid value
Acidity	Acidity
Acidity, free (acid value)	Acidity, free
Acidity, titratable	Acidity, titratable
Acids, free	Acidity, free
Acrylonitrile	Acrylonitrile
Aflatoxins, total	Aflatoxins, total (sum of B1, B2, G1 and G2)
Alcohol (ethanol) (Sections 3.2 Quality criteria and 3.3 Authenticity)	Ethanol
alpha-Linolenic Acid	Linolenic acid, alpha
Alpha-tocopherol	Tocopherol, alpha
Amino acid nitrogen	Nitrogen, amoniacal
Amino nitrogen	Nitrogen, amino
Ammonium < 3 % (m/m)	Ammonium
Anthocyanins (Sections 3.2 Quality criteria and 3.3 Authenticity)	Anthocyanins
Apparent density	Density, apparent
Arsenic	Arsenic
Ascorbic acid-L (additives)	Ascorbic acid
Ash	Ash
Ash (including P2O5)	Ash
Ash (inorganic extraneous matter)	Ash, insoluble
Ash (semolina)	Ash
Ash in fruit products (Sections 3.2 Quality criteria and 3.3 Authenticity)	Ash
Ash insoluble in HCl in cocoa nib, cocoa mass and cocoa press cake	Ash, insoluble
Ash insoluble in HCl	Ash, insoluble
Beet sugar in fruit juices (Sections 3.2 Quality criteria and 3.3 Authenticity)	Stable isotope ratio, oxygen
Benzoic acid	Benzoic acid
Benzoic acid and its salts	Benzoic acid
Benzoic acid and its salts; sorbic acid and its salts	Benzoic acid

	Sorbic acid
Benzoic acid as a marker in orange juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	Benzoic acid
Biotin	Biotin
Broken kernels	Kernels, broken
Butylhydroxyanisole, butylhydroxytoluene, tert-butylhydroquinone, & propyl gallate	Antioxidant, phenolics
C13/C12 ratio of ethanol derived from fruit juices (for the determination of quality and authenticity, according to Stan 247-2005 Sections 3.2 Quality criteria and 3.3 Authenticity)	Stable isotope ratio, carbon
cadmium	Cadmium
Cadmium and Lead	Cadmium
	Lead
Calcium	Calcium
Calcium and magnesium	Magnesium
	Calcium
Capsaicin	Capsaicin
Carbon dioxide (additives and processing aids)	Carbon dioxide
Carbon stable isotope ratio of apple juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	Stable isotope ratio, carbon
Carbon stable isotope ratio of orange juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	Stable isotope ratio, carbon
Carotenoid, total/individual groups (Sections 3.2 Quality criteria and 3.3 Authenticity)	Carotenoids, total and individual fractions
Carotenoids, total	Carotenoids, total
Casein in protein	Casein protein ratio
Cellobiose	Cellobiose
Centrifugable pulp (Sections 3.2 Quality criteria and 3.3 Authenticity)	Pulp, centrifugable
Chloride	Chloride
Chloride (expressed as sodium chloride) (Sections 3.2 Quality criteria and 3.3 Authenticity)	Chloride
Chloride in vegetable juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	Chloride
Choline	Choline
Chromium (Section B of STAN 72 only)	Chromium
Citric acid	Citric acid
Citric acid (additives)	Citric acid
Cocoa Butter	Fat, cocoa butter
Cocoa shell	Shell, cocoa
Colour	Colour
Conductivity ash	Ash, conductivity
Cooking Procedure	Cooking procedure
Copper	Copper
Copper and iron	Copper
	Iron
Copper, manganese, zinc, magnesium, iron	Copper
	Manganese
	Zinc
	Magnesium
Cottonseed oil	Iron
	Oil, cottonseed

Creatinine	Creatinine
Crismer value	Crismer value
Crude fat	Fat
Crude fibre	Fibre, crude
Crude protein	Protein
Crude protein (Nx6.25) $\geq$ 5 m/m%	Protein
Cyclamate	Cyclamate
Determination of granularity	Particle size
D-Fructose	Fructose, D-Fructose
D-Glucose	Glucose, D-Glucose
Diastase activity	Diastase
Dietary Fibre, Method applicable for determining dietary fibres that do not include the lower molecular weight fraction.	Fibre, dietary
Dietary fibre, total	Fibre, dietary
Dietary fibre, total/ Method applicable for determining the content of dietary fibres of higher and lower molecular weight. The method is applicable in food that may, or may not, contain resistant starches	Fibre, dietary
Dietary fibres (Method applicable for determining dietary fibres that do not include the lower molecular weight fraction. Provides sugar residue composition of dietary fibre polysaccharides, as well as content of Klason lignin)	Fibre, dietary
Dietary fibres (Method applicable for determining the content of dietary fibres of higher and lower molecular weight, in food where resistant starches are not present)	Fibre, dietary
Dietary fibres (Method applicable for determining the content of dietary fibres of higher and lower molecular weight. The method is applicable in food that may, or may not, contain resistant starches.)	Fibre, dietary
Dietary fibres (not include the lower molecular weight fraction, in foods and food products containing more than 10% dietary fibres and less than 2% starch (e.g. fruits))	Fibre, dietary
Dietary fibres, Method applicable for determining dietary fibres that do not include the lower molecular weight fraction and also includes determination for soluble and insoluble dietary fibres	Fibre, dietary
Difference between the actual and theoretical ECN 42 triglyceride content	Triglyceride
Dissolved iron	Iron, dissolved
Drained weight	Drained weight
Drained weight of shucked molluscs	Drained weight
Drained Weight	Drained weight
Dry extract – soluble solids	Dry matter
Dry matter	Dry matter
Dry matter (specified in individual standards)	Dry matter
Dry matter (total solids)	Dry matter
Electrical conductivity	Conductivity, electrical
Erythrodiol and uvaol	Erythrodiol and uvaol
Essential oils (in citrus fruit) (volume determination) (Sections 3.2 Quality criteria and 3.3 Authenticity)	Oils, essential
Essential oils (Scott titration) (Sections 3.2 Quality criteria and 3.3 Authenticity)	Oils, essential
Fat	Fat
Fat acidity	Acidity, Fat acidity
Fat content	Fat



Fat Crude	Fat
Fat in foods not containing starch, meat or vegetable products	Fat
Fat, total	Fat
Fat-free cocoa solids	Fat, Fat-free cocoa solids
Fat-free dry matter	Fat, Fat-free dry matter
Fat-free Milk Solids	Fat-free dry matter
Fatty acid composition various levels	Fatty acid, composition
Fatty acid composition	Fatty acid, composition
Fatty acids (including trans fatty acid)	Fatty acid, composition
Fatty acids in the 2-position of the triglycerides	Fatty acid, composition in the 2-position of the triglycerides
Fatty acids, free (expressed as oleic acid)	Fatty acid, free
Fermentability	Fermentability
Fibre, crude	Fibre, crude
Fill of containers	Fill of containers
Fish content (declaration)	Fish content
Fish/mince proportions	Proportion of whole and fragmented product
Folate	Folate
Folic acid	Folic acid
Folic Acid (as monoglutamate)	Folic acid
Formol number (Sections 3.2 Quality criteria and 3.3 Authenticity)	Formol number
Free amino acids (Sections 3.2 Quality criteria and 3.3 Authenticity)	Amino acid, free
Free fatty acids	Fatty acid, free fatty acid
Fructans (oligofructoses, inulin, hydrolyzed inulin, polyfructoses) fructooligosaccharides) (applicable to added fructans)	Fructans (oligofructoses, inulin, hydrolyzed inulin, polyfructoses, fructooligosaccharides)
Fructans (oligofructoses, inulin, hydrolyzed inulin, polyfructoses, fructooligosaccharides) (not applicable highly depolymerised fructans)	Fructans (oligofructoses, inulin, hydrolyzed inulin, polyfructoses, fructooligosaccharides)
Fructo-oligosaccharides (monomeric units<5)	Fructo-oligosaccharides (monomeric units<5)
Fructose and Glucose (sum of both)	Fructose and Glucose (sum of both)
Fumaric acid	Fumaric acid
Gelatinous condition	Gelatinous, condition gelatinous
GLC ranges of fatty acid composition	Fatty acid, composition
Gluconic acid (Sections 3.2 Quality criteria and 3.3 Authenticity)	Gluconic acid
Glucose fructose and saccharose (Sections 3.2 Quality criteria and 3.3 Authenticity)	Glucose
	Fructose
	Saccharose
Glucose-D and fructose-D (permitted ingredients)	Glucose, D-Glucose
	Fructose, D-Fructose
Gluten	Gluten
Glycerol	Glycerol
Granularity	Particle size
Halogenated solvents, traces	Halogenated solventes
Halphen test +/-	Oil, cotton seed
Hesperidin and naringin	Hesperidin
	Naringin
High Fructose Corn Syrup and Hydrolyzed Inulin Syrup in apple juice - HFCS & HIS in apple juice (permitted ingredients)	Fructose, high fructose
	Inulin
histamine	Histamine

Hydrogen carbonate (Bicarbonate HCO <sub>3</sub> <sup>-</sup> )	Bicarbonate
Hydroxymethylfurfural	Hydroxymethylfurfural
Insoluble dietary fibres in food and food products	Fibre, insoluble dietary fibres
Insoluble glucans and mannans of yeast cell wall (for yeast cell wall only)	Glucans and mannans of yeast cell wall (for yeast cell wall only), insoluble
Insoluble impurities	Impurities, insoluble impurities
Insoluble matter	Insoluble matter
Insoluble impurities in light petroleum	Impurities, insoluble impurities in light petroleum
Insoluble impurities	Impurities, Insoluble impurities
Invert sugar	Sugar, Inverted sugar
Iodine	Iodine
Iodine (milk based formula)	Iodine
Iodine value	Iodine value or Iodine Index
Iodine value (IV)	Iodine value or Iodine Index
Iodine value 6.3-148 % m/m absorbed iodine	Iodine value
Iodine (for milk-based formula)	Iodine
Iron	Iron
Iron and copper	Iron
	Copper
Irradiated food	Irradiation
Isocitric acid-D	Isocitric acid, D-Isoacitric acid
Lactic Acid	Lactic acid
Lactic acid- D and L	Lactic acid, D and L-Lactic Acid
Lactobacillus acidophilus	Lactobacillus acidophilus
Lactobacillus delbrueckii subsp bulgaricus & Streptococcus thermophilus	Lactobacillus delbrueckii subsp bulgaricus
	Streptococcus thermophiles
Lactose	Lactose
lead	Lead
Lead (Pb)	Lead
Lead, cadmium, copper, iron and zinc	Lead
	Cadmium
	Copper
	Iron
	Zinc
Linoleate	Linoleate
Linoleate (in the form of glycerides)	Linoleate
Linolenic Acid	Linolenic acid
Lipid Content	Lipid
L-malic/total malic acid ratio in apple juice	Malic acid, L-malic/total malic acid ratio
Loss on drying	Moisture
Loss on drying (milk based)	Moisture
Magnesium	Magnesium
Malic acid (additives)	Malic acid
Malic acid-D	Malic acid, D-Malic Acid
Malic acid-D in apple juice	Malic acid, D-Malic Acid
Malic acid-L	Malic acid, L-Malic Acid
Manganese	Manganese
Matter volatile at 105°C	Moisture
Melamine	Melamine

Mercury	Mercury
Methyl mercury	Methyl Mercury
Microorganisms constituting the starter culture	Microorganisms
Milk fat	Fat, milk fat
Milk Fat (min. 3.5% on dry matter)	Fat, milk fat
Milk fat content (butyric acid)	Fat, milk fat
Milk fat in dry matter	Fat, Milk fat
Milk fat in dry matter (FDM)	Fat, Milk fat
Milk fat in dry matter with high moisture	Fat, Milk fat
Milk fat in dry matter with low moisture	Fat, Milk fat
Milk fat purity	Fat, triglycerides
Milk protein	Protein
Milk protein (total N x 6.38 in dry matter)	Protein
Milk protein (total N x 6.38)	Protein
Milk protein in MSNF	Protein
Milk solids-not-fat (MSNF)	Dry matter, Fat-free
Milkfat	Fat
Mineral (ash)	Ash
Mineral impurities	Ash, insoluble
Mineral Impurities (Sand)	Ash, insoluble
Mineral oil	Oil, mineral
Minimum Drained Weight	Weight, Drained weight
Moisture	Moisture
Moisture & volatile matter at 105°C	Moisture
Moisture and volatile matter	Moisture
Moisture Content	Moisture
Moisture Content (for expression of values on dry matter)	Moisture
Moisture on fat free basis	Dry-matter, fat-free moisture
Moisture, "Free"	Dry-matter, fat-free moisture
Moisture/Total Solids	Moisture
	Dry-matter
Molybdenum (Section B of Codex Stan 72 -1981 only)	Molybdenum
Mould count	Mould count
MSNF	Dry-matter, fat-free moisture
Naringin and neohesperidin in orange juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	Naringin
	Neohesperidin
Natamycin	Natamycin
Net contents of products covered by glaze	Weight, Net weight
Net weight	Weight, Net weight
Net weight and drained weight drained wt/net wt ≥ 60%	Weight, Drained weight
Net weight of products covered by glaze	Weight, Net weight
Net weight of products covered by glaze with water added inside a "block-frozen" product	Weight, Net weight
Niacin	Niacin
Nicotinamide for foods not based on milk	Nicotinamide
Nicotinamide for milk-based foods	Nicotinamide
Nitrates	Nitrates
Nitrates and/or Nitrites	Nitrates
	Nitrites

Nitrite, potassium and/or sodium Salts	Nitrites
Nitrites	Nitrites
Nitrogen	Nitrogen, total
Nitrogen, total	Nitrogen, total
Nitrogen/Protein	Nitrogen/Protein Ratio
Non-cocoa butter vegetable fat	Non-cocoa butter
non-fat solids	Dry matter, Fat-free
Non-starch polysaccharides	Polysaccharides, non-starch
Oil content	Oil, content
Organoleptic characteristics	Organoleptic characteristics
Packing medium $\geq 10^{\circ}$ Brix Canned berry fruits (raspberry, strawberry)	Packing médium
P-Anisidine value	Anisidine, Anisidine P
Pantothenic acid	Pantothenic acid
Pantothenic acid/enriched foods	Pantothenic acid
Pantothenic acid/non-enriched foods	Pantothenic acid
Paralytic shellfish toxicity	Toxicity, paralytic shellfish
Particle Size (granularity)	Particle size
Pectin (additives)	Pectin
Peroxide value	Peroxide
Peroxide value (expressed as meq. of oxygen/kg fat)	Peroxide
Peroxide value (PV)	Peroxide
pH	pH
pH $\geq 4.0$ ; 4.0-4.6 (if acid is added)	pH
pH 4.5-7.0	pH
pH of brine	pH
Phenols	Phenols
Phosphorous	Phosphorous
Phosphorous/phosphate	Phosphorous
	Phosphate
pH-value	pH
Polarization	Polarization
Polydextrose	Polydextrose
Potassium	Potassium
Preservatives in fruit juices (sorbic acid and its salts)	Sorbic acid
Proline by photometry – non-specific determination	Proline
Proper fill (in lieu of drained weight)	Proper fill
Proportion of fish fillet and minced fish	Proportion of whole and fragmented product
Proportion of fish flesh in fish sticks (fish core)	Proportion of fish flesh in fish sticks (fish core)
Protein	Protein
Protein (N x 5.7)	Protein
Protein (Nx6.21)	Protein
Protein (Nx6.25)	Protein
Protein (Solubilized wheat protein)	Protein
Protein (Vital wheat gluten and devitalized wheat gluten)	Protein
Protein content	Protein
Protein Efficiency Ratio (PER)	Protein
Quinic, malic and citric acid in cranberry juice cocktail and apple juice	Quinic acid
	Malic acid

	Citric acid
Reducing sugar	Sugar, Reducing sugar
Refractive index	Refractive index
Reichert value and Polenske value	Reichert value
	Polenske value
Relative density (40 0C/water at 20 0C)	Density, relative density
Relative density	Density, relative density
Resistant starch (Recommended for RS3)	Resistant starch
Riboflavin	Riboflavin
Saccharin	Saccharin
Salt	Chloride expressed as NaCl
Salt (NaCl)	Chloride expressed as NaCl
Salt (sodium chloride)	Chloride expressed as NaCl
Salt content	Chloride expressed as NaCl
Salt in brine	Chloride expressed as NaCl
Sample preparation	Sample preparation
Saponification value	Saponification, Saponification value
Saturated fat	Fat, saturated fat
Saxitoxin Group	Saxitoxin
Scorched particles	Particles, Scorched particles
Sediment (scorched particles)	Particles, Scorched particles
Selenium	Selenium
Sesame seed oil	Oil, content
Silica (colloidal, calcium silicate)	Silica
Slip point	Slip point
Soap content	Soap content
Sodium	Sodium
Sodium + Potassium	Sodium
	Potassium
Sodium & Potassium	Sodium
	Potassium
Sodium and Potassium	Sodium
	Potassium
Sodium Chloride	Chloride expressed as NaCl
Sodium chloride $\leq 15\%$ m/m (dry basis)	Chloride expressed as NaCl
Sodium, potassium, calcium, magnesium in fruit juices	Sodium
	Potassium
	Calcium
	Magnesium
Solids	Dry matter
Solids (soluble)	Solids, soluble solids
Solids, alcohol insoluble	Solids, insoluble solids in alcohol
Solids, total	Dry matter
Solubility Index	Solubility Index
Soluble dietary fibres in food and food products	Fibre, dietary, soluble
Soluble solids	Solids, soluble solids
Soluble solids, total	Solids, soluble solids
Sorbate	Sorbates
Sorbates	Sorbates

Sorbitol	Sorbitol
Sorbitol-D	Sorbitol, D
Stable carbon isotope ratio in the pulp of fruit juices	Carbon stable isotope ratio
Stable carbon isotope ratio of sugars from fruit juices	Carbon stable isotope ratio
Stable hydrogen isotope ratio of water from fruit juices (Sections 3.2 Quality criteria and 3.3 Authenticity)	Hydrogen stable isotope ratio
Stable oxygen isotope ratio in fruit juice water	Oxygen stable isotope ratio
Starch	Starch
Sterol composition and total sterols	Sterols, total and composition
Sterol composition content	Sterols, composition
Sterol content	Sterols
Stigmastadienes	Stigmastadienes
Sucrose (permitted ingredients)	Sucrose
Sucrose content	Sucrose
Sucrose plus invert	Sucrose
Sugar beet derived syrups in frozen concentrated orange juice $\delta^{18}\text{O}$ Measurements in Water	Oxygen stable isotope ratio
Sugars	Sugars
Sugars added: detection of corn and cane sugar products.	Sugar, sugar profile
Sugars added: detection of high fructose syrup, corn syrup.	Sugar, high-fructose
Sugars added: for sugar profile	Sugars, sugar profile
sulphate	Sulphates
Sulphated ash	Ash, sulphated ash
Sulfates	Sulphates
Sulphide	Sulphites
Sulphites	Sulphites
Sulphur dioxide	Sulphur dioxide
Sulphur dioxide (additives)	Sulphur dioxide
Sum of aflatoxins B1, B2, G1 and G2	Aflatoxins, total (sum of B1, B2, G1 and G2)
Syrup measurements (Refractive index)	Refractive index
Tannins	Tannins
Tartaric acid in grape juice (additives)	Tartaric acid
Thawing procedure	Thawing procedure
Thiamine	Thiamine
Tin	Tin
Tin (Products in other containers)	Tin
Titration acids, total	Acids, Titration acids
Titre (0°C)	Titre
Tocopherol content	Tocopherol
Tomato soluble solids	Solids, soluble solids
Total acidity	Acidity, total
Total acidity (as lactic acid)	Acidity, total
Total acidity expressed as percentage of lactic acid	Acidity, total expressed as percentage of lactic acid
Total acidity of the extracted oil	Acidity, total
Total Acidity	Acidity, total
Total Ash	Ash, total
Total Ash, (Max, 10% m/m on fatfree .dry matter or 14% m/m) when treated with alkalizing agents	Ash, total
Total carbohydrates	Carbohydrates, total

Total carbohydrates Moisture/Total Solids Ash	Carbohydrates, total
	Moisture
	Dry matter
	Ash
Total carotenoids 300-2000 mg--carotene/kg	Carotenoids, total
Total dietary fiber	Fibre, dietary fibre
Total dry matter (vacuum-oven drying at 70°C)	Dry matter
Total fat	Fat
Total fat for milk-based infant formula (products not completed soluble in ammonia)	Fat
Total Fats	Fat
Total nitrogen	Nitrogen, total
Total phospholipids	Phospholipids, total
Total protein content	Protein
Total solids	Dry matter
Total solids (Microwave oven drying)*	Dry matter
Total solids $\geq 70.0\%$ m/m (glucose syrup) $\geq 93.0$ m/m (dried glucose syrup)	Dry matter
Total soluble solids	Solids, soluble solids
Totals Solids	Dry matter
Tough Strings	Tough Strings
Traces of halogenated solvents	Solvents, halogenated
trans fatty acids content	Fatty acids, trans
Trans-galacto-oligo saccharides	Galacto-oligo saccharides, trans
Types of peas, distinguishing	Classification, type of peas
Unsaponifiable matter	Unsaponifiable matter
Unsaponifiable matter 0-30 g/kg	Unsaponifiable matter
Vegetable fat (sterols)	Fat, sterols
Vinyl chloride monomer	Monomer, Vinyl chloride
Vitamin A	Vitamin A
Vitamin A above 500 IU/l milk after reconstitution	Vitamin A
Vitamin A in foods in which carotenes have been added as a source of vitamin A	Vitamin A
Vitamin B12	Vitamin B12
Vitamin B6	Vitamin B6
Vitamin C	Vitamin C
Vitamin C (dehydro-ascorbic acid and ascorbic acid)	Vitamin C
Vitamin D	Vitamin D
Vitamin D (D3, milk based infant formula)	Vitamin D3
Vitamin E	Vitamin E
Vitamin E (milk based infant formula)	Vitamin E
Vitamin K	Vitamin K
Vitamin K1	Vitamin K1
Wash drained weight	Weight, wash drained
Water	Water activity
Water activity	Water activity
Water activity $\leq 0.75$	Water activity
Water capacity	Fill of containers
Water Capacity and Fill of Containers	Fill of containers

Water content	Water
Water phase salt	Salt, salt in water phase
Water-insoluble solids content	Solids, Water-insoluble solids
Wax content	Wax
Zinc	Zinc

### Annex 3: LIST OF THE PRINCIPLES OF METHODS

Principle in CODEX STAN 234	Principle suggested
AAS	Flame atomic absorption spectrometry
AAS (Flame absorption)	Flame atomic absorption spectrometry
AAS after drying ashing	Flame atomic absorption spectrometry
Absorption in ultra violet	Spectrophotometry
Acid hydrolysis and spectrophotometry	Spectrophotometry
Acid hydrolysis, preparation of methyl esters and gas chromatography	Gas chromatography
Acidimetry and nephelometry	Titrimetry Nephelometry
air drying	Gravimetry
Alkali hydrolysis	Sample Preparation
Analysis of triglycerides of HPLC and calculation	High Performance Liquid Chromatography
Anodic stripping voltametry	Anodic stripping voltametry
Ashing	Gravimetry
Atomic Absorption	Graphite furnace atomic absorption spectrometry
Atomic absorption spectrophotometry	Flame Atomic Absorption Spectrometry
Atomic absorption Spectrophotometry (Atomic absorption Spectrophotometry (direct graphite furnace)	Graphite furnace atomic absorption spectrometry
Atomic absorption Spectrophotometry (direct graphite furnace)	Graphite furnace atomic absorption spectrometry
Atomic absorption spectrophotometry (Flame absorption)	Flame atomic absorption spectrometry
Atomic Absorption Spectroscopy	Flame Atomic absorption spectrometry
Atomic absorption spectrophotometry (direct graphite furnace)	Graphite furnace atomic absorption spectrometry
Bioassay	Bioassay
Calculation	Gravimetry
Calculation from determination triglycerides by gas chromatography	Gas chromatography
Calculation from dry matter content and content fat Gravimetry, drying at 102 °C Gravimetry (Schmid-Bondzynski-Ratzlaff)	Gravimetry
Calculation from fat content and dry matter content Gravimetry (Röse Gottlieb) Gravimetry, drying at 88 °C	Gravimetry
Calculation from fat content and dry matter content Gravimetry (Schmid-Bondzynski-Ratzlaff) Gravimetry, drying at 102 °C	Gravimetry
Calculation from fat content and moisture content Gravimetry drying at 102°C (forced air oven) Gravimetry (Schmid-Bondzynski-Ratzlaff)	Gravimetry
Calculation from total solids content and fat content Gravimetry (Röse-Gottlieb)	Gravimetry
Calculation from total solids content, fat content and sugar content	Gravimetry
Calculation: Gravimetry (Röse-Gottlieb) Gravimetry	Gravimetry
CAP GC Method	Gas chromatography
Capillary gas chromatography	Gas chromatography
Capillary GLC	Gas chromatography
Carbon isotope ratio mass spectrometry	Mass spectrometry



Centrifugation	Centrifugation
Centrifugation/% value	Centrifugation
Ceramic fiber filtration	Gravimetry
Chemical & HPAEC-PAD	High Performance Liquid Chromatography
cold vapour atomic absorption spectrometry	Cold vapour atomic absorption spectrometry
Colony count at 25 °C, 30 °C, 37 °C a 45 °C according to the starter organism question	Colony count
Colony count at 37 °C	Colony count
Colony-count at 25 °C	Colony count
Colorimetric	Spectrophotometry
Colorimetry	Spectrophotometry
Colorimetry (cadmium reduction)	Spectrophotometry
Colorimetry (dichloroindophenol)	Spectrophotometry
Colorimetry (diethyldithiocarbamate)	Spectrophotometry
Colorimetry (dithizone)	Spectrophotometry
Colorimetry (Molybdenum blue)	Spectrophotometry
Colorimetry (molybdovanadate)	Spectrophotometry
Colorimetry using specific colour grader	Spectrophotometry
Colorimetry, diethyldithiocarbamate	Spectrophotometry
Colorimetry, diethyldithiocarbamates	Spectrophotometry
Colour reaction	Colour reaction
Complexometry Titrimetry	Titrimetry
Conductimetry	Conductimetry
Continuous hydride generation Flame atomic absorption spectrometry (HGAAS)	Hydride generation atomic absorption spectrometry
Cooking	Cooking
Densitometry	Densitometry
Determination by difference Gravimetry Gravimetry	Gravimetry
Determining formaldehyde titration method subtracting by ammoniacal nitrogen (magnesium oxide method)	Titrimetry
Deuterium Nuclear Magnetic Resonance (Deuterium NMR)	Nuclear Magnetic Resonance
digestion	Sample Preparation
Digestion/titration	Sample Preparation / Titrimetry
Direct Epifluorescent Filter Technique/Aerobic Plate Count (DEFT/APC)	Direct epifluorescent count / Colony Count
distillation (Scott) , titration	Titrimetry
Distillation and direct reading of the volume determination	Titrimetry
DNA comet assay	Electrophoresis
Drying and weighing	Gravimetry
Electrical conductance	Conductimetry
Electrochemical titrimetry	Titrimetry
electrometry	Potentiometry
Enzymatic gravimetry High Pressure Liquid Chromatography	Gravimetry High Performance Liquid Chromatography
Enzymatic & colorimetric	Spectrophotometry
Enzymatic & HPAEC-PAD	High Performance Liquid Chromatography
Enzymatic Colorimetric Method with limitations on applicability due to choline and ascorbate concentration.	Spectrophotometry

Enzymatic determination	Spectrophotometry
Enzymatic determination and HPLC	High Performance Liquid Chromatography
Enzymatic digestion/gravimetry	Gravimetry
Enzymatic GC/ colorimetry gravimetry	Gas chromatography Spectrophotometry Gravimetry
Enzymatic method	Spectrophotometry
Enzymatic method: Part 1 - Glucose moiety or Part 2 - Galactose moiety	Spectrophotometry
Enzymatic/Gravimetry	Gravimetry
Enzymatic-Gravimetry High Pressure Liquid Chromatography	High Performance Liquid Chromatography
ESR spectroscopy	Electron Spin Resonance spectroscopy
Extraction and separation on alumina	Sample Preparation
Extraction/gravimetry	Gravimetry
Flame atomic absorption	Flame atomic absorption spectrometry
Flame atomic absorption spectrophotometry	Flame atomic absorption spectrometry
Flame atomic absorption spectrometry	Flame atomic absorption spectrometry
Flame atomic absorption spectroscopy	Flame atomic absorption spectrometry
Flameless atomic absorption spectrophotometry	Cold Vapour Atomic absorption spectrometry
Flotation and sedimentation	Sample Preparation
Fluorescence spectrometry	Fluorometry
Fluorometry	Fluorometry
Gas chromatographic analysis of hydrocarbons	Gas chromatography
Gas chromatographic method	Gas chromatography
Gas chromatographic/spectrophotometric analysis of 2/alkylcyclobutanones	Gas chromatography
Gas chromatography	Gas chromatography
Gas chromatography ("head-space")	Gas chromatography
Gas chromatography of methyl esters	Gas chromatography
Gas chromatography with suitable extraction and preparation procedures	Gas chromatography
Gas cromatograhya	Gas chromatography
Gas-Liquid Chromatography	
GC	Gas chromatography
GC	Gas chromatography
GFAAS	Graphite furnace atomic absorption spectrometry
GLC	Gas chromatography
Graphite furnace AAS after pressure digestion	Graphite furnace atomic absorption spectrometry
Graphite furnace atomic absorption after dry ashing	Graphite furnace atomic absorption spectrometry
Gravimetic	Gravimetry
Gravimetric determination	Gravimetry
Gravimetry (loss on drying)	Gravimetry
Gravimetry Direct determination of fat using solvent extraction	Gravimetry
Gravimetry (ashing at 825 °C )	Gravimetry
Gravimetry (drying at 102 °C)	Gravimetry
Gravimetry (drying at 120°C for 16 h)	Gravimetry
Gravimetry (drying at 87°C)	Gravimetry
Gravimetry (drying at 88 °C ±2°C)	Gravimetry
Gravimetry (enzymatic digestion)	Gravimetry
Gravimetry (ether extraction)	Gravimetry
Gravimetry (extraction)	Gravimetry

Gravimetry (extraction)	Gravimetry
Gravimetry (ignition at 600°C)	Gravimetry
Gravimetry (open drying)	Gravimetry
Gravimetry (Röse-Gottlieb)	Gravimetry
Gravimetry (Schmid-Bondzynski-Ratzlaff)	Gravimetry
Gravimetry (Schmid-Bondzynski-Ratzlaff) (for samples containing lactose up to 5%) Gravimetry (Weibull-Berntrop) (for samples containing lactose over 5%)	Gravimetry
Gravimetry (sieving) note: Use a No. 14 screen instead of '7/16' or No. 8	Gravimetry
Gravimetry (Soxhlet extraction)	Gravimetry
Gravimetry (vacuum oven)	Gravimetry
Gravimetry (vacuum)	Gravimetry
Gravimetry (Weibull-Berntrop)	Gravimetry
Gravimetry after solvent extraction	Gravimetry
Gravimetry drying at 102 °C (forced air oven)	Gravimetry
Gravimetry(ether extraction)	Gravimetry
Gravimetry, after ashing at 550°C	Gravimetry
Gravimetry, Calculation	Gravimetry
Gravimetry, Direct	Gravimetry
Gravimetry, Direct determination of fat using solvent extraction	Gravimetry
Gravimetry, drying at 102 °C	Gravimetry
Gravimetry, drying at 87 °C	Gravimetry
Gravimetry, drying at atmospheric pressure	Gravimetry
High performance liquid chromatography	High Performance Liquid Chromatography
Holaday-Velasco minicolumn	High Performance Liquid Chromatography
Howard mould count	Microscopy
HPLC-PAD	High Performance Liquid Chromatography
HPLC	High Performance Liquid Chromatography
HPLC with post column derivatization and immunoaffinity column clean up	High Performance Liquid Chromatography
HPLC with pre-or post column derivatization to thiochrom	High Performance Liquid Chromatography
HPLC with C30 column to separate the cis- and the trans- K vitamins	High Performance Liquid Chromatography
HPLC, incorporating immunoaffinity clean-up and conversion to 5-methyltetrahydrofolate	High Performance Liquid Chromatography
Hydride generation atomic absorption spectrometry (HGAAS)	Hydride generation atomic absorption spectrometry
ICP emission spectroscopy	Optical emission spectrometry with Inductively Coupled Plasma
ICP-MS	Mass spectrometry with Inductively Coupled Plasma
ICP-MS ; GF-AAS ICP-MS	Mass spectrometry with Inductively Coupled Plasma
	Graphite furnace atomic absorption spectrometry
	Mass spectrometry with Inductively Coupled Plasma
ICP-OES	Optical emission spectrometry with Inductively Coupled Plasma
Immunoaffinity Column (Aflatest) Method Equipment Chromatography/Column Chromatography, Spectroscopy/Fluorometer	High Performance Liquid Chromatography
Immunoassay	Immunoassay

Indirect by refractometry	Refractometry
Indophenol method	Spectrophotometry
Inductively Coupled Plasma optic emission spectrophotometry	Optical emission spectrometry with Inductively Coupled Plasma
Ion chromatography	High Performance Liquid Chromatography
Ion-exchange chromatographic method	High Performance Liquid Chromatography
Ion-selective potentiometry	Potentiometry
Karl Fisher	Titrimetry
Kjeldahl	Titrimetry
Kjeldahl digestion	Titrimetry
Kjeldahl, titrimetry	Titrimetry
LC	High Performance Liquid Chromatography
LC-FL	High Performance Liquid Chromatography
LC-MS/MS	High Performance Liquid Chromatography - Mass Spectrometry
Liquid chromatography	High Performance Liquid Chromatography
Liquid chromatography, refractive index detection	High Performance Liquid Chromatography
Magnesium oxide	Titrimetry
Microbioassay	Microbioassay and turbidimetry
Microbioassay and turbidimetry	Microbioassay and turbidimetry
Microbiological method	
Microbiological turbidimetry	Turbidimetry
Microfluorometry	Fluorimetry
Molecular absorption spectrophotometry	Spectrophotometry
Mouse bioassay	Bioassay
Open ended capillary tube	Melting point
Optical Biosensor Immunoassay	Potentiometry
Oven evaporation and factor	Gravimetry
Oxygen isotope ratio analysis	Mass spectrometry
Panel test	Sensory analysis
Part 1: Optimized Monier-Williams method	Titrimetry Gravimetry
Part 2: Enzymatic method	Spectrophotometry
Photometric determination	Spectrophotometry
Photometry	Spectrophotometry
Photometry (bathophenanthroline)	Spectrophotometry
Photometry (diethyldithiocarbamate)	Spectrophotometry
Photometry (phenol and H <sub>2</sub> SO <sub>4</sub> )	Spectrophotometry
Photometry, diethyldithiocarbamate	Spectrophotometry
Photostimulated luminescence	Photostimulated luminescence
Physical separation	Gravimetry
Polarimetry	Polarimetry
Potentiometric titration	Potentiometric titration
Potentiometry	Potentiometry
Potentiometry (determination of chloride expressed as sodium chloride)	Potentiometry
Potentiometry, titration to pH 8.30	Potentiometry
Pouring and measuring	
Precipitation/photometry	Spectrophotometry

Preparation of fatty acids methyl esters	Sample Preparation
Pycnometry	Pycnometry
Rat bioassay	Bioassay
Receptor binding assay	Radioassay
Refractometry	Refractometry
Romer minicolumn Ultraviolet Light Source	Minicolumn screening / Fluorescence
Sieving	
Sieving Gravimetry	Gravimetry
Single sulphonation	Gravimetry
Sohxlet extraction – Gravimetric	Gravimetry
Spectrometry	Spectrophotometry
Spectrometric determination of nitrate and nitrite content of meat products after enzymatic reduction of nitrate to nitrite	Spectrophotometry
Spectrometry	Spectrophotometry
Spectrophotometer	Spectrophotometry
Spectrophotometry	Spectrophotometry
Spectrophotometry (1,5 diphenylthiocarbazone)	Spectrophotometry
Spectrophotometry (molybdovanadate)	Spectrophotometry
Spectrophotometry, silver diethyldithiocarbamate	Spectrophotometry
Spiral vessel count, Stone cell count	Microscopy
Stable isotope mass spectrometry	Mass spectrometry
Stretching	Rheological measurement
Test for strain identification	Biochemical test
Thawing	Thawing
Thermoluminescence	Thermoluminescence
Thermometry	Thermometry
Thin layer chromatography	Thin-Layer Chromatography
Thin-Layer Chromatography-Fluorodensit	Thin-Layer Chromatography
Titration	Titrimetry
Titrimetry	Titrimetry
Titrimetry (aqueous extract)	Titrimetry
Titrimetry (back-titration after precipitation)	Titrimetry
Titrimetry (Karl Fischer)	Titrimetry
Titrimetry (Kjeldahl)	Titrimetry
Titrimetry (Lane & Eynon)	Titrimetry
Titrimetry (Mercuric nitrate)	Titrimetry
Titrimetry (Mohr: determination of chloride, expressed as sodium chloride)	Titrimetry
Titrimetry , Kjeldahl digestion	Titrimetry
Titrimetry after distillation	Titrimetry
Titrimetry after extraction with diethyl ether I	Titrimetry
Titrimetry after extraction with diethyl ether	Titrimetry
Titrimetry after extraction with diethyl ether	Titrimetry
Titrimetry using iso-octane	Titrimetry
Titrimetry using sodium thiosulphate	Titrimetry
Titrimetry Chloride expressed as sodium chloride	Titrimetry
Titrimetry, Kjeldahl	Titrimetry
Titrimetry, Kjeldahl digestion	Titrimetry

Titrimetry, Kjeldahl digestion; after extraction of milk protein	Titrimetry
Titrimetry, titration to pH 8.4	Titrimetry
Titrimetry/Distillation	Titrimetry
TLC followed by spectrophotometry or GLC	Thin layer chromatography Spectrophotometry Gas chromatography
Tritrimetry	Titrimetry
Turbidimetric Method	Turbidimetry
Turbidity	Turbidimetry
Visual comparison with standard disks, after filtration	Visual inspection
Visual inspection	Visual inspection
Volumetry	Volumetry
Volumetry (modified Van Slyke)	Volumetry
Weighting	Gravimetry
Wijs-Titrimetry	Titrimetry

## **CODEX GENERAL METHODS (for consideration by CCMAS)**

### **INTRODUCTION**

In previous meetings, CCMAS identified inconsistencies related with the use of the term, “Codex general method” within CODEX STAN 234, 228 and 239.

Members and observers were invited to participate in this electronic working group in order to elaborate considerations on the correct use of the term “Codex general method” with regard of consistency and usability and make considerations on the following points:

- Whether the content of CODEX STAN 228 and 239 should be incorporated in CODEX STAN 234 for better reference;
- Whether the term “Codex general method” should be used 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 if the term should not be used;
- Whether to indicate that a method is Codex general method throughout CODEX STAN 234;
- Whether the Codex general method(s) should be preferable over other methods, when there are both a specific and a Codex general method(s) recommended for a specific commodity/ provision combination, unless otherwise stated
- Whether is necessary to add a footnote when the type of “Codex general method” recommended for a specific commodity/provision combination is different.

### **CODEX GENERAL METHODS**

The eWG understood that it is necessary to establish clear requirements to classify a method as a “Codex general method”, including usability criteria and the way to present them in CODEX STAN 234 (e.g. a separate table or mention the method in each commodity).

Annex B presents the list of Codex general methods grouped by principle included in the CODEX STAN 234. It shows that a “Codex general method” involves the same principle, but not the same commodity, provision or type of method. It shows that there are “Codex general methods” applicable to one or many provisions or commodities.

In order to avoid future inconsistencies between different codex standards it could be better to include the codex methods into a unified GENERAL CODEX METHOD LIST.

Some general comments could be done as follows:

*Why is it important to use the category of “Codex general methods” through the CODEX METHOD LIST?*

The *General Criteria for the Selection of Methods of Analysis* of the Codex Procedural Manual establish that, methods of analysis applicable uniformly to various groups of commodities are preferable over methods that apply only to individual commodities. So it could be useful to identify these kinds of methods.

*What is necessary to classify a method as “Codex general” one?*

A “Codex general method” may include:

- Methods that share the same principle.
- Methods applicable to all food or more than one commodity into the CODEX METHOD LIST.

The same Codex General Method may have different type classification depending on the commodity.

*Does the “Codex general methods” category apply to those methods applicable to all foods, all food with some exceptions, or to a group or groups of foods?*

This aspect was analysed by the eWG with case studies as presented in Annex A. It was an example to define the approach, and the tools to systematize this evaluation as follows:

- AOAC triangle (Annex C. Reference: AOAC official methods of analysis, Guidelines for standards method validation requirements)
- FDA Commodity groups and representative commodities (Annex D. Reference: Guidelines for the validation of chemical methods for the FDA FVM Program)

The result of the eWG participant comments of this exercise were considered and summarized to respond to CCMAS37 request as follow:

- Whether the content of the *General Methods of Analysis for Contaminants* (CODEX STAN 228-2001) and *General Methods of Analysis for Food Additives* (CODEX STAN 239-2004) should be incorporated in CODEX STAN 234 for better reference.

The eWG supported to incorporate the Codex general methods in CODEX STAN 228 and CODEX 239 into CODEX STAN 234, i.e including these standards as annexes in CODEX STAN 234.

- Whether the term “Codex general method” should be used for 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 if the term should not be used;

There were two criteria to consider in this point:

- Where to use the term “Codex general methods”
- And where to use the category “all food methods”

For “Codex general methods”:

Some participants proposed not to use the term “Codex general methods” considering, for example:

- Once methods are presented in the (new) format of this Standard, users of the Standard would have sufficient information for the selection of a method and to which commodity the method can be applied so that the information whether a method is “Codex general method” or not would no longer be necessary.
- If the Committee agreed that “Codex general method” should be defined and used in the Standard, it would force the Committee and the Codex Secretariat a larger maintenance cost to keep it updated and accurate.

Most participants agreed to maintain the term “Codex general methods” and proposed to define that the decision on whether a method should be given or retain ‘general method’ status by CCMAS needs to be based on its general applicability and easily adaptability to a large range of commodities.

A solution would be to replace the term “general methods” by the wording “horizontal methods”, if validated for multiple matrices and indicate the validated matrices for a given method.

A new definition of Codex general method was proposed as: “a method which is applicable uniformly to a group or various groups of commodities”.

It was suggested that the Codex general methods should be reviewed by CCMAS as a workable package to determine their applicability.

For “all food methods”:

Most of the eWG participants proposed that all methods need to be validated in each specific matrix, or group of matrices if a robustness test were done to demonstrate its applicability. As with all analytical methods, they need to be validated to ensure that the method performance is fit for purpose for any new matrices for a given method.

Some participants proposed that the term “applicable to all food” should be used only in specific situations where it has been demonstrated that the matrix does not influence.

- Whether to indicate that a method is a Codex general method throughout CODEX STAN 234;
- Whether it is necessary to add a footnote when the type of “Codex general method” recommended for a specific commodity/provision combination is different.

The eWG suggested that it will be very helpful to indicate the validated matrices for each method.

If the term ‘applicable to all foods’ is kept, it would be necessary to complete the term “all food” with the list of matrices that were actually validated, see hypothetical example below:



Commodity	Provision	Codex Stan	Method	Validated matrices	Principle	Type	Year of Endorsement	Committee
all foods	Aspartame	67-1987	ISOXYZ	Marzipan, Fruit yogurt, jam, Orange juice, Cola, Cream and Yogurt	AAS	II	1987	CCNFSDU

- Whether the Codex general method(s) should be preferable over other methods, when there are both a specific and a Codex general method(s) recommended for a specific commodity/ provision combination, unless otherwise stated

It is important to maintain the *General Criteria for the Selection of Methods of Analysis* described in the Codex Procedural Manual.

Methods of analysis applicable uniformly to various groups of commodities are preferable over methods that apply only to individual commodities, as long as both methods are fit for purpose.

#### **FUTURE WORK:**

- To include the Codex methods into a unified GENERAL CODEX METHOD LIST and review the Codex general methods as a workable package;
- To define clearly the concept of matrix and its scope;
- To define a methodology and requirements to demonstrate not matrix influence in the test result for specific situations;
- If it is necessary to establish a specific EWG to discuss criteria to “General Codex Methods”.

## CASE STUDIES

**STUDY CASE 1 – Method classified as “all food Method”**

Acesulfame K, Aspartame - EN 12856:1999-04

Classified as Type II / All food method

METHOD: EN 12856:1999-04

Determination of acesulfame K, aspartame and saccharin - High performance liquid chromatographic method

**METHOD SCOPE:**

This European Standard specifies a high performance liquid chromatographic (HPLC) method for the determination of acesulfame-K, aspartame and saccharin. It also allows the determination of caffeine, sorbic acid and benzoic acid in foodstuffs.

**PRINCIPLE:**

The sample is extracted or diluted with water. If necessary, the sample solution with the intense sweeteners is purified on a solid phase extraction column or with Carrez reagents. The intense sweeteners in the sample test solution are separated on an HPLC-reversed phase chromatography column and determined spectrometrically at a wavelength of 220 nm.

**VALIDATION DATA:**

Acesulfame-K: Inter-laboratory tests have been carried out with in marzipan, yogurt, fruit yogurt, orange juice beverage, cola, cream and jam.

Aspartame: Inter-laboratory tests have been carried out with in marzipan, fruit yogurt, orange juice beverage, orange flavoured beverage, cola, jam, and preparation for flan.

The following data were obtained in inter-laboratory tests according to ISO 5725:1986 conducted by the Max von Pettenkofer-Institute of the Federal Health Office, Food Chemistry Department, Berlin, Germany\* on marzipan, fruit yoghurt, cola and orange juice beverage. Further inter-laboratory tests were conducted by the French Institute for Beverages, Brewing and Malting (IFBM)\*\* on cola, orange flavoured beverage, jam, and preparation for flan. Further inter-laboratory tests were conducted by the Ministry of Agriculture, Fisheries and Food, MAFF\*\*\*, Norwich Research Park, UK on orange juice beverage, cola, cream, yoghurt and orange juice.

acesulfame-K	marzipan * mg/kg	fruit yogu rt* mg/kg	orange juice* beverage mg/l	jam** mg/kg
Year of inter-laboratory test	1992	1992	1992	1993
Number of laboratories	8	8	13	9
Number of samples	1	1	1	1
Number of laboratories retained after eliminating outliers	7	7	10	9
Number of outliers (laboratories)	1	1	3	0
Number of accepted results	38	38	53	9
Mean value	256,6	230,8	172,0	60
Repeatability standard deviation $s_r$	18,7	7,7	2,1	2,9
Repeatability relative standard deviation $RSD_r$ %	7,3	3,4	1,2	4,8
Repeatability limit r	52,0	21,8	5,8	8
Reproducibility standard deviation $s_R$	28,1	22,9	5,0	10,7
Reproducibility relative standard deviation $RSD_R$ %	11,1	10,0	3,0	17,8
Reproducibility limit R	79,6	64,7	14,3	30
Horrat value	1,6	1,5	0,5	2,2

acesulfame-K	orange juice beverage ** * mg/l	cola*** mg/l	cream *** mg/kg	yogurt* ** mg/kg	orange juice*** mg/kg
Year of inter-laboratory test	1995	1995	1995	1995	1995
Number of laboratories	12	12	11	11	11
Number of samples	2	2	2	2	2
Number of laboratories retained after eliminating outliers	11	11	8	10	7
Number of outliers (laboratories)	1	1	3	1	4
Number of accepted results	22	22	16	20	14
Mean value	370	351	316	264	24,3
Repeatability standard deviation $s_r$	10,9	7,3	5,4	12,4	1,9
Repeatability relative standard deviation $RSD_r$ , %	3	2	2	5	8
Repeatability limit r	30	20	15	35	6
Reproducibility standard deviation $s_R$	23,5	19,7	49,3	47,6	12,2
Reproducibility relative standard deviation $RSD_r$ , %	6	6	16	18	50
Reproducibility limit R	66	55	138	133	34
Horrat value	1,0	0,8	2,3	2,6	5,1

The method is defined by the standard as an all food method. The validation data includes the commodities Marzipan, Fruit yogurt, jam, Orange juice, Cola, Cream and Yogurt. Codex commodity for this method is all food.

Using the AOAC triangle and the FDA commodity groups as a tool to identify groups of foods for validation, it could be found that for:

- AOAC triangle: foods (Marzipan, Fruit yogurt, jam, Orange juice, Cola, Cream and Yogurt) fall inside sectors 1, 5, 6, 8 of the triangle
- FDA commodity groups: foods (Marzipan, Fruit yogurt, jam, Orange juice, Cola, Cream and Yogurt) fall inside group number 2, 3, 7, 8 commodity groups

*This method could be classified as an "all food one"? It is necessary to validate the method in all groups of matrix?*

**Participants of the electronic working group are invited to propose opinions related with the suitability of classify this method as an all food one and the usability of these criteria for classify the methods as applicable for:**

- **all foods**
- **all foods with some exceptions**
- **applicable to a group or groups of foods**
- **or not to use the term all food, an so, no criteria will be necessary because it will be included the specific food into de CODEX GENERAL METHOD LIST**

Comments from participants indicates that the decision on whether a method should be given or retain 'general method' status by the CCMAS needs to be based on its general applicability and easily adaptability to a large range of commodities. The adaptability should be confirmed by undertaking validation components by the analyst for non-collaboratively trialed commodities. Some participants suggested that it is essential to take into account the level of analyte being measured beyond the food matrix, and that there may be many other relevant criteria in limiting the scope of application of a method.

Some participants proposed that the Codex General Method definition should be revised to read: "a method which are applicable uniformly to those a group or various groups of commodities."

For this example the participants agree that the method cannot be considered "General Method", because is missing many essential validation information. It was suggested that more samples should be analyzed, with different analyte concentration, in a collaborative study, not only an interlaboratory test. With regard to applicability, it could be to establish the criteria: "the method is applicable to a group or groups of foods."

**STUDY CASE 2 – Method classified as “individual food Method”**

METHOD: AOAC official Method 930.28 - Sulfites in foods

## METHOD SCOPE:

(Applicable of determination of  $\geq 10$  ppm (mg/g) sulfites in foods. Applicable in presence of other volatile sulfur compounds; not applicable to dried onions, leeks, and cabbage.)

## PRINCIPLE

Method measures free sulfite plus reproducible portion of bound sulfites, such as carbonyl addition products, in foods. Test portion is heated with refluxing HCl (ca 1M) to convert sulfite to SO<sub>2</sub>. Stream of N<sub>2</sub> introduced below surface of refluxing solution sweeps SO<sub>2</sub> through water-cooled con denser and, via bubbler attached to con denser, with 3% H<sub>2</sub>O<sub>2</sub> solution, where SO<sub>2</sub> is oxidized to H<sub>2</sub>SO<sub>4</sub>.

Sulfite content is directly related to generated H<sub>2</sub>SO<sub>4</sub>, which is determined by titration with standardized NaOH solution. For verification, sulfate can be determined gravimetrically as BaSO<sub>4</sub>.

## VALIDATION DATA:

Table 990.28 Interlaboratory study results for sulfites in foods

Matrix	Mean ug/g	Sr	RSDr, %	SR	RSDr, %	HorRat
Hominy	9.17	1.33	14.5	1.42	15.5	1.36
Fruit juice	8.05	1.36	16.9	1.62	20.1	1.73
Protein (seafood)	10.41	1.47	14.1	2.77	26.6	2.38

## RECOVERIES ASSAYS:

HMS recoveries of  $\geq 80\%$  from food matrixes fortified at 10 ppm are recommended to ensure accurate analytical data.

ADDITIONAL VALIDATION DATA. - JAOAC 72, 470(1989)

Table 4. Statistical summary of collaborative results for determination of sulfite in foods

Food	Target conc, ppm	Av. Rec., ppm	RSDr,%	RSDR,%
Hominy	5	4.88	20.0	31.6
	10	9.17	14.5	15.5
	20	15.41	10.0	10.0
Fruit juice	5	2.87	27.2	36.5
	10	6.89	15.8	20.3
	10 (HMS fortified)	8.05	16.9	20.1
	20	17.87	9.4	14.8
Protein (seafood)	5	6.67	15.3	19.2
	10	10.41	14.1	26.6

The method is defined by the standard as an all food method. The validation data includes the commodities Hominy, fruit juice, Cola and seafood. Codex commodity for this method is individual foods.

Using the AOAC triangle and the FDA commodity groups as a toll to identify groups of foods for validation, it could be found that for:

- AOAC triangle: foods (Hominy, fruit juice, Cola and seafood) fall inside sectors 5, 9 sectors of the triangle
- FDA commodity groups: foods (Hominy, fruit juice, Cola and seafood) fall inside group number 1, 2, 7 of the commodity groups.

**Participants of the electronic working group are invited to propose opinions related with the suitability of classify this method as an individual foods method or could be preferably classify as an:**

- **all foods**
- **all foods with some exceptions**
- **applicable to a group or groups of foods**

- ***or not to use the term all food, an so, no criteria will be necessary because it will be included the specific food into de CODEX GENERAL METHOD LIST***

The ewg participants suggested that in this case the method is defined its applicability as “individual foods” or “all foods with some exeptions” method since it is not covering a broad spectrum of matrices. Some participants says that as the validation has been completed for two sectors at the extreme of the AOAC triangle, it supports an extended group of matrices but as suggested insufficient number and range of matrices have been validated to qualify as a ‘general method’.

## ANNEX B

## CODEX GENERAL METHODS LIST (CODEX STAN 234:1999 / 2015)

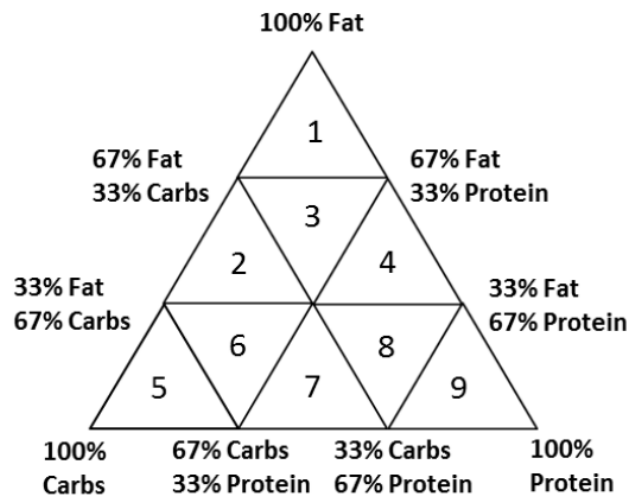
Principle	Method	Commodity	Provision	Type of method
Colorimetry (diethyldithiocarbamate)	AOAC 952.13	Fats and Oils (all)	Arsenic	II
Colorimetry (molybdenum blue)	AOAC 942.17	Fats and Oils (all)	Arsenic	III
Colorimetry	AOAC 960.40	Natural mineral waters	Copper	III
Colorimetry	AOAC 973.31	Canned corned beef	Nitrites, potassium and/or sodium salt	II
Colorimetry	AOAC 973.31	Cooked cured chopped meat	Nitrites	II
Colorimetry	AOAC 973.31	Cooked cured ham	Nitrites	II
Colorimetry	AOAC 973.31	Cooked cured pork shoulder	Nitrites	II
Colorimetry	AOAC 973.31	Luncheon meat	Nitrites, potassium and/or sodium salt	II
AAS (Flame absorption)	AOAC 972.25	Processed fruits and vegetables	Lead	III
Atomic absorption spectrophotometry (direct graphite furnace)	AOAC 994.02 ISO 12193:2004 AOCS Ca 18c-91 (03)	Fats and Oils (all)	Lead	II
Atomic absorption Spectrophotometry (direct graphite furnace)	AOAC 990.05 ISO 8294:1994 or AOCS Ca 18b-91 (03)	Fats and oils not covered by individual standards	Copper and Iron	II
Atomic absorption Spectrophotometry (direct graphite furnace)	AOAC 990.05 ISO 8294:1994; or AOCS Ca 18b-91 (03)	Named Animal Fats	Copper and Iron	II
Atomic absorption spectrophotometry	NMKL 139 (1991)	Milk products	Iron	II
Atomic absorption spectrophotometry	AOAC 972.25	Butter	Lead	II
Atomic absorption spectrophotometry	AOAC 972.25	Edible casein products	Lead	II
Atomic absorption spectrophotometry	NMKL 139 (1991)	Edible casein products	Lead	III
Atomic absorption spectrophotometry	AOAC 972.25	Whey powders	Lead	II
Atomic absorption spectrophotometry	AOAC 986.15	Natural mineral waters	Arsenic	II
Atomic absorption spectrophotometry	AOAC 985.16	Fats and Oils (all)	Arsenic	III
AAS	AOAC 980.19	Processed fruits and vegetables	Tin	II
Atomic absorption spectrophotometry	AOAC 985.16	Processed meat and poultry products	Tin	II
Atomic absorption spectrophotometry	AOAC 972.25	Canned corned beef	Lead	II
Atomic absorption spectrophotometry	AOAC 985.16	Canned corned beef	Tin (Products in tinplate and other containers)	II
Atomic absorption spectrophotometry	AOAC 972.25	Cooked cured chopped meat	Lead	II

Atomic absorption spectrophotometry	AOAC 985.16	Cooked cured chopped meat	Tin	II
Atomic absorption spectrophotometry	AOAC 972.25	Cooked cured ham	Lead	II
Atomic absorption spectrophotometry	AOAC 985.16	Cooked cured ham	Tin	II
Atomic absorption spectrophotometry	AOAC 972.25	Cooked cured pork shoulder	Lead	II
Atomic absorption spectrophotometry	AOAC 985.16	Cooked cured pork shoulder	Tin	II
Atomic absorption spectrophotometry	AOAC 972.25	Luncheon meat	Lead	II
Atomic absorption spectrophotometry	AOAC 985.16	Luncheon meat	Tin	II
Potentiometry	AOAC 971.27	Margarine	Sodium chloride	II
Potentiometry	AOAC 971.27	Minarine	Sodium chloride	II
Potentiometry	AOAC 971.21	Quick frozen blocks of fish fillet, minced fish flesh and mixtures of fillets and minced fish flesh	Sodium chloride	II
Potentiometry	AOAC 971.27	Quick frozen fish sticks (fish fingers) and fish portions - breaded or in batter	Sodium chloride	II
Potentiometry	AOAC 971.27	Special foods	Chloride	II
Potentiometry	AOAC 971.27	Pickled cucumbers	Salt in brine	II
Potentiometry	AOAC 971.27	Table olives	Salt in brine	II
Titration	AOAC 971.27 (Codex general method) ISO 3634:1979	Vegetable juice	Chloride	II
Anodic stripping voltanmetry	AOAC 982.23	Edible casein products	Lead	III
Anodic stripping voltanmetry	AOAC 986.15	Natural mineral waters	Cadmium	III
Sieving Gravimetry	AOAC 968.30 Codex General Method for processed fruits and vegetables	Processed fruits and vegetables	Drained Weight	I

### AOAC TRIANGLE

Force on Methods for Nutrition Labelling developed a triangle partitioned into sectors in which foods are placed based on their protein, fat, and carbohydrate content. Since ash does not have a great impact on the performance of an analytical method for organic-material foods, and water can be added or removed, it can be assumed that the behavior of an analytical method is determined to large extent by the relative proportions of these proximates.

AOAC INTERNATIONAL anticipated that one or two foods in a given sector would be representative of other foods in that sector and therefore would be useful for method assessment. Similarly, one or two reference materials in a given sector (or near each other in adjacent sectors) should be useful for quality assurance for analyses involving the other foods in the sector.



Source: AOAC Official Methods of Analysis (2012)



## ANNEX D

## FDA COMMODITY GROUPS AND REPRESENTATIVE COMMODITIES

Commodity groups	Typical commodity categories	Typical representative commodities
1. High water content	Pome fruit	Apples, pears
	Stone fruit	Apricots, cherries, peaches
	Other fruit	Bananas
	Alliums	Onions, leeks
	Fruiting vegetables/cucurbits	Tomatoes, peppers, cucumber, melon
	Brassica vegetables	Cauliflower, Brussels sprouts, cabbage, broccoli
	Leafy vegetables and fresh herbs	Lettuce, spinach, basil
	Stem and stalk vegetables	Celery, asparagus
	Forage/fodder crops	Fresh alfalfa, fodder vetch, fresh sugar beets
	Fresh legume vegetables	Fresh peas with pods, peas, mange tout, broad beans, runner beans, French beans
	Leaves of root and tuber vegetables	Sugar beet and fodder beet tops
	Fresh Fungi	Champignons, canterelles
	Root and tuber vegetables or feed	Sugar beet and fodder beet roots, carrots, potatoes, sweet potatoes
2. High acid content and high water content	Citrus fruit	Lemons, mandarins, tangerines, oranges
	Small fruit and berries	Strawberry, blueberry, raspberry, black currant, red currant, white currant, grapes
	Other	Kiwifruit, pineapple, rhubarb

Commodity groups	Typical commodity categories	Typical representative commodities
3. High sugar and low water content	Honey, dried fruit	Honey, raisins, dried apricots, dried plums, fruit jams
4a. High oil content and very low water content	Tree nuts	Walnuts, hazelnuts
	Oil seeds	Oilseed rape, sunflower, cotton-seed, soybeans, peanuts, sesame, etc.
	Pastes of tree nuts and oil seeds	Peanut butter, tahini, hazelnut paste
	Oils from tree nuts, oil seeds and oily fruits	Olive oil, rapeseed oil, sunflower oil, pumpkin seed oil
4b. High oil content and intermediate water content	Oily fruits and products	Olives, avocados and pastes thereof
5. High starch and/or protein content and low water and fat content	Dry legume vegetables/pulses	Field bean, dried broad bean, dried haricot bean (yellow, white/navy, brown, speckled), lentils
	Cereal grain and products thereof	Wheat, rye, barley and oat grain; maize, rice, whole meal bread, white bread, crackers, breakfast cereals, pasta
6. "Difficult or unique commodities"		Hops, cocoa beans and products thereof, Coffee, tea, spices
7. Meat (muscle) and Seafood	Red muscle	Beef, pork, lamb, game, horse
	White muscle	Chicken, duck, turkey
	Offal	Liver, kidney
	Fish	Cod, haddock, salmon, trout
	Crustaceans	Shrimp, scallop, crab
8. Milk and milk products	Milk	Cow, goat and buffalo milk
	Cheese	Cow and goat cheese
	Dairy products	Yogurt, cream
9. Eggs	Eggs	Chicken, duck, quail, and goose eggs
10. Fat from food of animal origin	Fat from meat	Kidney fat, lard
	Milk fat	Butter
	Fish oil	Cod liver oil

Source: *Guidelines for the Validation of Chemical Methods for the FDA FVM Program (2<sup>nd</sup> Ed.)*

## METHODS OF ANALYSES WORKABLE PACKAGES

(FOR CONSIDERATION BY PWG ON ENDORSEMENT METHODS OF ANALYSIS)

## WORKABLE PACKAGE 1- RM Methods

**ACTIONS SUGGESTED: Identify new methods and remove the references to RM from CODEX STAN 234 and Commodities Standards**

In REP15/MAS the CAC/RM 46 was replaced by ISO 8106 and 90.1 to drained weight for canned fruits, but the reference to RM methods were not replaced.

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Canned Apple Sauce	CODEX STAN 17	Fill of containers	CAC/RM 46 (for glass containers) (Codex general method for processed fruits and vegetables) and ISO 90-1 (for metal containers) (Codex general method for processed fruits and vegetables)	Weighing	I	CCPFV	REP15/MAS replaced CAC/RM 46 by ISO 8106 ISO 90.1 was not found
Canned green beans and wax beans	CODEX STAN 297	Tough strings	CAC/RM 39	Stretching	I	CCPFV	The CAC RM was withdrawn
Canned Green Peas	CODEX STAN 297	Proper fill (in lieu of drained weight)	CAC/RM 45	Pouring and measuring	I	CCPFV	The CAC RM was withdrawn
Canned Green peas	CODEX STAN 297	Types of peas, distinguishing	CAC/RM 48	Visual inspection	I	CCPFV	The CAC RM was withdrawn
Canned Green beans	CODEX STAN 297	Tough strings	CAC/RM 39	Stretching	I	CCPFV	The CAC RM was withdrawn The Codex Stan 234 mentions the commodity: Canned green beans and wax beans
Canned mushrooms	CODEX STAN 038	Wash drained weight	CAC/RM44	Sieving	I	CCPFV	The The CAC RM was withdrawn
Chilli sauce	CODEX STAN 306R	Fill of containers	CAC/RM 46 (Codex general method)	Weighing	I	CCASIA	The CAC RM was withdrawn

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Jams and jellies	CODEX STAN 296	Fill of containers	CAC/RM 46	Weighing	I	CCPFV	The CAC RM was withdrawn CODEX STAN 234 mentions and describes CAC/RM 46. The Commodity described is Jams (fruit preserves) and jellies CODEX STAN 296 mentions and describes CAC/RM 46 for glass containers and mentions ISO90.1 to metal containers. In the REP2015 the CAC/RM 46 was replaced by ISO 8106 and 90.1 to drained weight for canned fruits.
Processed Fruits and Vegetables	STAN 103; 110; 111; 112; 113; 114; 115; 130; 131; 143; 145; 160; 017; 177; 223; 240; 241; 242; 254; 260; 296; 297; 319; 320; 38; 39; 41; 42; 52; 57; 60; 62; 66; 67; 69; 75; 76; 77; 78; 99	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	CCPFV	ISO 90.1 was not found REP15/MAS - The Committee agreed to replace the CAC/RM 46-1972 (method for fill of glass containers) with ISO 8106 (Glass containers – determination of capacity by gravimetric methods). The Committee agreed to apply this change to all relevant standards on processed fruits and vegetables and to inform the Committee on Processed Fruits and Vegetables accordingly
Quick frozen fruits and vegetables	CODEX STAN 320	Net weight	CAC/RM 34	Weighing	I	CCPFV	The CAC RM was withdrawn
Quick frozen fruits and vegetables	CODEX STAN 320	Thawing procedure	CAC/RM 32	Thawing	I	CCPFV	The CAC RM was withdrawn
Quick frozen fruits and vegetables: Berries, leek and carrot	CODEX STAN 320	Mineral impurities	CAC/RM 54	Flotation and sedimentation	I	CCPFV	The CAC RM was withdrawn
Quick frozen fruits and vegetables: Berries, Whole kernel corn and Corn-on-the-cob	CODEX STAN 320	Soluble solids, total	CAC/RM 43	Refractometry	I	CCPFV	The CAC RM was withdrawn
Quick frozen green and wax beans	CODEX STAN 113	Tough Strings	CAC/RM 39	Stretching	I	CCPFV	The CAC RM was withdrawn

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Quick frozen peas	CODEX STAN 41	Solids, alcohol insoluble	CAC/RM 35	Gravimetry	I	CCPFV	The CAC RM was withdrawn
Raisins	CODEX STAN 067	Mineral impurities	CAC/RM 51	Ashing	I	CCPFV	The CAC RM was withdrawn
Raisins	CODEX STAN 067	Mineral oil	CAC/RM 52	Extraction and separation on alumina	II	CCPFV	The CAC RM was withdrawn
Soy protein products	CODEX STAN 175	Fat	CAC/RM 55-Method 1	Gravimetry (extraction)	I	CCVP	The CAC/RM is withdrawn
Special foods	not found	Fat	CAC/RM 55	Gravimetry (extraction)	I	CCNFSDU	The CAC RM was withdrawn
Special foods	not found	Fat in foods not containing starch, meat or vegetable products	CAC/RM 1, B-2	Gravimetry	I	CCNFSDU	The CAC RM was withdrawn
Special foods	not found	Fill of containers	CAC/RM 46	Weighing	I	CCNFSDU	The CAC RM was withdrawn
Table olives	CODEX STAN 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	CCPFV	There are a full description of the method on CODEX/STAN 66 The CAC RM was withdrawn ISO 90.1 was not found
Vegetable protein products	CODEX STAN 174	Ash	AOAC 923.03 ISO 2171 (Method B)	Gravimetry, Direct	I	CCVP	Equivalency of the methods is not confirmed
Vegetable protein products	CODEX STAN 174	Fat	CAC/RM 55-Method 1	Gravimetry (extraction)	I	CCVP	The CAC/RM is withdrawn

**WORKABLE PACKAGE 2- Multiple Type II Methods****ACTIONS SUGGESTED: Identify which one is the Type I method and delete the others. Amend the Codex standards accordingly.**

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Blend of evaporated skimmed milk and vegetable fat	CODEX STAN 250	Milk solids-not-fat (MSNF) ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 6731 IDF 21 and ISO 1737 IDF 13	Calculation from total solids content and fat content Gravimetry (Röse-Gottlieb)	I	CCMMP	Multiple type I method
Chocolate and chocolate products	CODEX STAN 87	Cocoa butter	AOAC 963.15 IOCCC 14	Gravimetry (Soxhlet extraction)	I	CCCPC	Multiple type I method
Chocolate and chocolate products	CODEX STAN 87	Milk Fat	IOCCC 5 AOAC 945.34; 925.41B; 920.80	Titrimetry/Distillation	I	CCCPC	Multiple type I method
Chocolate and chocolate products	CODEX STAN 87	Moisture	IOCCC 26 or AOAC 977.10 (Karl Fischer method); or AOAC 931.04 or IOCCC 1	Gravimetry	I	CCCPC	Multiple type I method
Cocoa (Cacao) Mass or Cocoa/ Chocolate Liquor, and Cocoa Cake	CODEX STAN 141	Fat content	AOAC 963.15 or IOCCC 14	Soxhlet extraction - Gravimetric	I	CCCPC	Multiple type I method
Cocoa Butter	CODEX STAN 86	Free fatty acids	ISO660; or AOCS Cd 3d-63	Titrimetry	I	CCCPC	Multiple type I method The CODEX STAN 86 mentions the following methods: IUPAC (1987) 2.201.
Cocoa Butter	CODEX STAN 86	Unsaponifiable matter	ISO 3596 or ISO 18609 or AOCS Ca 6b-53	Titrimetry after extraction with diethyl ether I	I	CCCPC	Multiple type I method The Codex Stan 86 mentions IUPAC (1987) 2.401.
Cocoa powders (cocoa) and dry cocoa-sugar mixtures	CODEX STAN 105	moisture	IOCCC 26 or AOAC 977.10 (Karl Fischer method)	Gravimetry	I	CCCPC	Multiple type I method Codex Stan 105-81 mention AOAC 977.04 which is for Pesticide Formulations
Degermed maize (corn) meal and maize (corn) grits	CODEX STAN 155	Ash	AOAC 923.03 ISO 2171 ICC Method No 104/1	-	I	CCCPL	Multiple type I method

Degermed maize (corn) meal and maize (corn) grits	CODEX STAN 155	fat, Crude	AOAC 945.38F; 920.39C	Gravimetry (ether extraction)	I	CCCPL	Multiple type I method The Annex of CODEX STAN 155 mentions ISO 5986 which is for Animal feeding stuffs - - Determination of diethyl ether extract and is withdrawn. The AOAC 920.39C is for animal feed.
Degermed maize (corn) meal and maize (corn) grits	CODEX STAN 155	Moisture	ISO 712 ICC Method No 110/1	Gravimetry	I	CCCPL	Multiple type I method
Desiccated Coconut	CODEX STAN 177	Total acidity of the extracted oil	ISO 660 or AOCS Cd 3d-63	Titrimetry	I	CCPFV	Multiple type I method
Durum wheat semolina and durum wheat flour	CODEX STAN 178	Ash (semolina)	AOAC 923.03 ISO 2171	Gravimetry	I	CCCPL	Multiple type I method
Durum wheat semolina and durum wheat flour	CODEX STAN 178	Moisture	ISO 712 ICC 110/1	Gravimetry	I	CCCPL	Multiple type I method
Edible casein products	CODEX STAN 290	Ash (including P2O5)	ISO 5545 IDF 90 or ISO 5544 IDF 89	Gravimetry (ashing at 825 °C )	I	CCMMP	Multiple type I method
Fats and oils (all)	CODEX STAN 19	Soap content	BS 684 Section 2.5; or AOCS Cc 17-95	Gravimetry	I	CCFO	Multiple Type I method The BS 684 Section 2.5 method was replaced By: BS EN ISO 10539:2002 which is for alkalinity The principle of the AOCS CC17-95 method titrimetry
Fats and oils not covered by individual standards	CODEX STAN 19	Acid Value	ISO 660; or AOCS Cd 3d-63	Titrimetry	I	CCFA	Multiple Type I method CODEX STAN 19 mentions a IUPAC method
Fats and oils not covered by individual standards	CODEX STAN 19	Peroxide value	AOCS Cd 8b-90 ISO 3960	Titrimetry using iso-octane	I	CCFO	Multiple Type I method CODEX STAN 19 mentions the following: "According to IUPAC 2.501 (as amended), AOCS Cd 8b - 90 (97) or ISO 3961: 1998" ISO 3961 is for iodine value
Fermented milks	CODEX STAN 243	Milk fat	ISO 1211   IDF 1 / AOAC 989.05	Gravimetry (Röse-Gottlieb)	I	CCMMP	Multiple Type I method

Fish oils	CODEX STAN 19	Acid Value	AOCS Ca 5a-40 AOCS CD 3D-63 ISO 3960 NMKL 38	Titration	I	CCFO	Multiple Type I method
Fish oils	CODEX STAN 19	Peroxide value	AOCS Cd 8b-90 ISO 3960 NMKL 158	Titration	I	CCFO	Multiple type I method
Fish oils	CODEX STAN 19	Peroxide value	European Pharmacopeia 2.5.5 (Part B Iso-octane as solvent)	Titration	I	CCFO	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Ash in fruit products (Sections 3.2 Quality criteria and 3.3 Authenticity)	AOAC 940.26; EN 1135; IFUMA 9	Gravimetry	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Carotenoid, total/individual groups (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12136; IFUMA 59	Spectrophotometry	I	TFFJ/CCFA	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Centrifugable pulp (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12134; IFUMA 60	Centrifugation/% value	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Essential oils (Scott titration) (Sections 3.2 Quality criteria and 3.3 Authenticity) ("Because there is no numerical value in the Standard duplicate Type I methods has been included which may lead to different results.")	AOAC 968.20; IFUMA 45	(Scott) distillation, titration	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Formol number (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 1133; IFUMA 30	Potentiometric titration	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Free amino acids (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12742; IFUMA 57	Liquid Chromatography	II	TFFJ	Multiple type I method



Fruit juices and nectars	CODEX STAN 247	Lactic acid- D and L (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12631 IFUMA 53	Enzymatic determination	II	TFFJ/CCFA	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Malic acid-D	EN 12138 IFUMA 64	Enzymatic determination	II	TFFJ/CCFA	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Soluble solids	AOAC 983.17 EN 12143 IFUMA 8 ISO 2173	Indirect by refractometry	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Starch (Sections 3.2 Quality criteria and 3.3 Authenticity)	AOAC 925.38 IFUMA 73	Colorimetric	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Titration acids, total (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12147 IFUMA 03 ISO 750	Titrimetry	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Total dry matter (vacuum-oven drying at 70°C) (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12145; IFUMA 61	Gravimetric determination	I	TFFJ	Multiple type I method
Fruit juices and nectars	CODEX STAN 247	Total nitrogen	EN 12135 IFUMA 28	Digestion/titration	I	TFFJ	Multiple type I method
Infant formula	CODEX STAN 72	Total carbohydrates Moisture/Total Solids Ash	AOAC 986.25 AOAC 990.19 or AOAC 990.20 ISO 6731 IDF 21 AOAC 942.05	Determination by difference Gravimetry Gravimetry	I	CCNFSDU	Multiple type I method to calculate moisture/total solids The AOAC 986.25 mentions several methods to calculate total Carbohydrates, including AOAC 990.19 and 990.20. The other methods are not mention in the AOAC 986.25. The CCMAS should evaluate just mention the AOAC 986.25. Method AOAC 942.05 is for Animal Feed.
Infant formula	CODEX STAN 72	Total fat	AOAC 989.05 ISO 8381 IDF 123	Gravimetry (Röse-Gottlieb)	I	CCNFSDU	Multiple type I method
Named Animal Fats	CODEX STAN 211	Acidity	ISO 660; or AOCS Cd 3d-63	Titrimetry	I	CCFO	Multiple Type I methods, The CODEX STAN 211 mentions IUPAC 2.201 and ISO 660.
Named Animal Fats	CODEX STAN 211	Saponification value	ISO 3657; or AOCS Cd 3-25	Titrimetry	I	CCFO	Multiple Type I method CODEX STAN 211 mentioned IUPAC 2.202 or ISO 3657.

Named Animal Fats	CODEX STAN 211	Titre (°C)	ISO 935; or AOCS Cc 12-59	Thermometry	I	CCFO	Multiple Type I method The Stan 211 mentions ISO 935: 1988 or IUPAC 2.121 method
Named Animal Fats	CODEX STAN 211	Iodine value (IV)	ISO 3961 or AOAC 993.20 or AOCS Cd 1d-92	Wijs-Titrimetry	I	CCFO	Multiple type I method There are methods in the Codex Stan 211: IUPAC 2.205/1, ISO 3961: 1996, AOAC 993.20, or AOCS Cd 1d-1992 (97)
Named Animal Fats	CODEX STAN 211	Peroxide value	AOCS Cd 8b-90 ISO 3960	Titrimetry using iso-octane	I	CCFO	Multiple type I method There are methods in the Codex Stan 211: IUPAC 2.501 (as amended), AOCS Cd 8b-90 (97) or ISO 3960: 1998.
Named Animal Fats	CODEX STAN 211	Unsaponifiable matter	ISO 3596 or ISO 18609; or AOCS Ca 6b-53	Titrimetry after extraction with diethyl ether	I	CCFO	Multiple type I method There are methods in the Codex Stan 211: IUPAC 2.401 (part 1-5) or ISO 3596-1: 1988 and Amendment 1 1997, and ISO 3596-2: 1988 and Amendment 1 1999.
Named Vegetable Oils	CODEX STAN 210	Acidity	ISO 660; or AOCS Cd 3d-63	Titrimetry	I	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Apparent density	ISO 6883 with the appropriate conversion factor; or AOCS Cc 10c-95	Pycnometry	I	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Iodine value (IV) ("It is possible to calculate the Iodine Value from fatty acid composition data obtained by gas chromatography e.g. using AOCS Cd 1b-87" )	Wijs - ISO 3961; or AOAC 993.20; or AOCS Cd 1d-92; or NMKL 39	Wijs-Titrimetry	I	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Peroxide value (PV)	AOCS Cd 8b-90 or ISO 3960	Titrimetry	I	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Refractive index	ISO 6320 or AOCS Cc 7-25	Refractometry	II	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Saponification value (SV)	ISO 3657 or AOCS Cd 3-25	Titrimetry	I	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	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	CCFO	Multiple type I method

Named Vegetable Oils	CODEX STAN 210	Soap content	BS 684 Section 2.5; or AOCS Cc 17-95	Gravimetry	I	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Sterol content	ISO 12228 or AOCS Ch 6-91	Gas chromatographic method	II	CCFO	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Tocopherol content	ISO 9936 or AOCS Ce 8-89	HPLC	II	CCFO/CCFA	Multiple type I method
Named Vegetable Oils	CODEX STAN 210	Unsaponifiable matter	ISO 3596 or ISO 18609 or AOCS Ca 6b-53	Gravimetry	I	CCFO	Multiple type I method
Non-fermented soybean products	CODEX STAN 175	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	CCASIA	Multiple type I method The AOAC mehtod is for Animal Feed, Pet Foods
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Absorbency in ultraviolet	COI/T.20/Doc. No. 19 or ISO 3656 or AOCS Ch 5-91	Absorption in ultra violet	II	CCFO	Multiple type I method
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Acidity, free (acid value)	ISO 660 or AOCS Cd 3d-63	Titrimetry	I	CCFO	Multiple type I method
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Iodine value	ISO 3961 or AOAC 993.20 or AOCS Cd 1d-92 or NMKL 39	Wijs-Titrimetry	I	CCFO	Multiple type I method
Olive Oils and Olive Pomace Oils	CODEX STAN 33 CODEX STAN 193	Lead	AOAC 994.02 or ISO 12193 or AOCS Ca 18c-91	AAS	II	CCFO/CCCF	Multiple type I method
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Peroxide value	ISO 3960 or AOCS Cd 8b-90	Titrimetry	I	CCFO	Multiple type I method
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Saponification value	ISO 3657 or AOCS Cd 3-25	Titrimetry	I	CCFO	Multiple type I method
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Unsaponifiable matter	ISO 3596 or ISO 18609 or AOCS Ca 6b-53	Gravimetry	I	CCFO	Multiple type I method The AOCS method was not found

Pearl millet flour	CODEX STAN 170	Moisture	ISO 712; ICC 110/1	Gravimetry	I	CCCPL	Multiple type I method
Processed Fruits and Vegetables	STAN 103-1981, STAN 110-1981, STAN 111-1981, STAN 112 -1981, STAN 113-1981, STAN 114-1981, STAN 115-1981, STAN 13 – 1981/201, STAN 130 - 1981, STAN 131 - 1981, STAN 143 - 1985, STAN 145 - 1985, STAN 160 - 1987, STAN 017 – 1981 - 2001, STAN 177 – 1991 - 2011, STAN 223 - 2001, STAN 240 - 2003, STAN 241 – 2003 - 2015, STAN 242 - 2003, STAN 254 – 2007 - 2013, STAN 260 – 2007 - 2015	Packing medium Canned berry fruits (raspberry, strawberry)	AOAC 932.12 ISO 2173	Refractometry	I	CCPFV	Multiple type I method
Processed Fruits and Vegetables		Soluble solids	ISO 2173 AOAC 932.12	Refractometry	I	CCPFV	Multiple type I method

Reduced fat blend of evaporated skimmed milk and vegetable fat	CODEX STAN 250	Milk solids-not-fat (MSNF)	ISO 6731 IDF 21 and ISO 1737 IDF 13	Calculation from total solids content and fat content Gravimetry (Röse-Gottlieb)	I	CCMMP	Multiple type I method
Sorghum flour	CODEX STAN 173	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	CCCPL	Multiple type I method
Sorghum flour	CODEX STAN 173	Fat, Crude	AOAC 945.38F; 920.39C	Gravimetry(ether extraction)	I	CCCPL	Multiple Type I method CODEX STAN 173 mentions: AOAC 945.38F, 920.39C and ISO 5986 ISO 5986 (withdrawn). ISO 920.39 is for Animal Feed
Sorghum flour	CODEX STAN 173	Fibre, Crude	ICC 113 ISO 6541	Gravimetry	I	CCCPL	Multiple type I method
Sorghum flour	CODEX STAN 173	Moisture	ISO 712 ICC 110/1	Gravimetry	I	CCCPL	Multiple type I method
Sorghum grains	CODEX STAN 172	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	CCCPL	Multiple Type I method
Soy protein products	CODEX STAN 175	Ash	AOAC 923.03 ISO 2171 (Method B)	Gravimetry	I	CCVP	Multiple Type I method
Special foods	not found	Linoleate (in the form of glycerides)	AOAC 922.06; 969.33; 963.22	Acid hydrolysis, preparation of methyl esters and gas chromatography	II	CCNFSDU/CCFA	Multiple type II method Method AOAC 922.06 described for flour. Method AOAC 969.33 described for Oils and Fats. Method AOAC 963.22 described for Oils and Fats.
Special foods	not found	Loss on drying (milk based)	AOAC 925.23 ISO 6731 IDF 21	Gravimetry	I	CCNFSDU	Multiple Type I method Method AOAC 925.23 is for Milk . Method ISO 6731 and IDF 21 is for milk, cream and evaporated milk.
Vegetable protein products	CODEX STAN 174	Ash	AOAC 923.03 ISO 2171 (Method B)	Gravimetry, Direct	I	CCVP	Multiple Type I methods
Wheat flour	CODEX STAN 152	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	CCCPL	Multiple type I method
Wheat flour	CODEX STAN 152	Moisture	ISO 712 ICC 110/1	Gravimetry	I	CCCPL	Multiple type I method

Wheat protein products including wheat gluten	CODEX STAN 163	Ash	AOAC 923.03 ISO 2171: method B	Gravimetry	I	CCCPL	The Codex Stan 163 mentions the same methods: AOAC 923.03 ISO 2171 Multiple type I method
Whole and Decorticated Pearl Millet Grains	CODEX STAN 169	moisture	ISO 712 ICC 110/1	Gravimetry	I	CCCPL	Multiple type I method The codex Stan 169 doesnt mention method for this provision
Whole maize (corn) meal	CODEX STAN 154	Ash	AOAC 923.03 ISO 2171 ICC 104/1	Gravimetry	I	CCCPL	Multiple type I method
Whole maize (corn) meal	CODEX STAN 154	Fat, Crude	AOAC 945.38F; 920.39C	Gravimetry	I	CCCPL	Multiple Type I CODEX STAN 154 mentions: AOAC 945.38F, AOAC 920.39C and ISO 5986. ISO 5986 is withdraw
Whole maize (corn) meal	CODEX STAN 154	moisture	ISO 712 ICC 110/1	Gravimetry	I	CCCPL	Multiple type I method

### WORKABLE PACKAGE 3- Equivalency of Type II Methods

**ACTIONS SUGGESTED:** Check the equivalency of the methods and amend the Codex documents accordingly. Use a vertical bar “|” if they are considered identical or identify which one is the Type II method and classify the others as Type III

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Chocolate and chocolate products	CODEX STAN 87	Fat-free milk solids	IOCCC 17 or AOAC 939.02	Titrimetry, Kjeldahl digestion; after extraction of milk proteins	II	CCCPC	Equivalency of the methods is not confirmed
Fats and oils	CODEX STAN 19	Butylhydroxyanisole, butylhydroxytoluene, tert-butylhydroquinone, & propyl gallate	AOAC 983.15 AOCS Ce 6-86	Liquid chromatography	II	CCFO/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Acetic acid (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12632; IFUMA 66	Enzymatic determination	II	TFFJ/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Benzoic acid and its salts; sorbic acid and its salts	IFUMA 63 NMKL 124	HPLC	II	TFFJ/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Glucose fructose and saccharose (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 12630 IFUMA 67 NMKL 148	HPLC	II	TFFJ	Equivalency of the methods is not confirmed In CODEX STAN 234 the type is III

Fruit juices and nectars	CODEX STAN 247	Glucose-D and fructose-D (permitted ingredients)	EN 1140 IFUMA 55	Enzymatic determination	II	TFFJ	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Hesperidin and naringin	EN 12148 IFUMA 58	HPLC	II	TFFJ	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Malic acid-L	EN 1138 IFUMA 21	Enzymatic determination	II	TFFJ/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Phosphorus/phosphate (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 1136; IFUMA 50	Photometric determination	II	TFFJ/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Relative density (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 1131 (1993); IFUMA 01 & IFU Method No General sheet (1971)	Pycnometry	II	TFFJ	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Sodium, potassium, calcium, magnesium in fruit juices (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 1134; IFUMA 33	Atomic Absorption Spectroscopy	II	TFFJ	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Stable carbon isotope ratio in the pulp of fruit juices (Sections 3.2 Quality criteria and 3.3 Authenticity)	ENV 13070 Analytica Chimica Acta 340 (1997)	Stable isotope mass spectrometry	II	TFFJ	Equivalency of the methods is not confirmed The Analytica Chimica Acta 340 (1997) method was not found
Fruit juices and nectars	CODEX STAN 247	Stable carbon isotope ratio of sugars from fruit juices (Sections 3.2 Quality criteria and 3.3 Authenticity)	ENV 12140 Analytica Chimica Acta.271 (1993)	Stable isotope mass spectrometry	II	TFFJ	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Sucrose (permitted ingredients)	EN 12630 IFUMA 67 NMKL 148	HPLC	II	TFFJ/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Sulphur dioxide (additives)	Optimized Monier Williams AOAC 990.28 IFUMA 7A NMKL 132	Titrimetry after distillation	II	TFFJ/CCFA	Equivalency of the methods is not confirmed
Fruit juices and nectars	CODEX STAN 247	Tartaric acid in grape juice (additives)	EN 12137 IFUMA 65	HPLC	II	TFFJ/CCFA	Equivalency of the methods is not confirmed

Guidelines for nutrition labelling	not found	Saturated fat	AOAC 996.06; or AOCS Ce 1h-05	Gas liquid chromatography	II	CCNFSDU	Equivalency of the methods is not confirmed
Infant formula	CODEX STAN 72	Vitamin B6	AOAC 2004.07 EN 14164 (Free and bound phosphorylated forms (pyridoxal, pyridoxine and pyridoxamine) converted and measured as pyridoxine)	HPLC	II	CCNFSDU	Equivalency of the methods is not confirmed
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Refractive index	ISO 6320 or AOCS Cc 7-25	Refractometry	II	CCFO	Equivalency of the methods is not confirmed
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Sterol composition and total sterols	COI/T.20/Doc. no. 30   ISO 12228-2 or AOCS Ch 6-91	Gas cromatograhya	II	CCFO	Equivalency of the methods is not confirmed CODEX STAN 033 mentions: COI/T.20/Doc. no. 10 or ISO 12228:1999 or AOCS Ch 6-91 (97), as type I
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Stigmastadienes	COI/T.20/Doc. no. 11 or ISO 15788-1 or AOCS Cd 26-96	Gas chromatography	II	CCFO	Equivalency of the methods is not confirmed
Olive Oils and Olive Pomace Oils	CODEX STAN 33	trans fatty acids content	COI/T.20/Doc no. 17 or ISO 15304 or AOCS Ch 2a-94	Gas chromatography of methyl esters	II	CCFO	Equivalency of the methods is not confirmed The method AOCS in CODEX STAN 33 is AOCS Ce 1f-96 COI/T.20/Doc no. 17 didn't found in COI site.
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Wax content	COI/T.20/Doc. no. 18 or AOCS Ch 8-02	Gas chromatography	II	CCFO	Equivalency of the methods is not confirmed
Sugars (plantation or mill white sugar)	CODEX STAN 212	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	CCS	Equivalency of the methods is not confirmed
Sugars (powdered sugar and powdered dextrose)	CODEX STAN 212	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	CCS	Equivalency of the methods is not confirmed
Sugars (raw cane sugar)	CODEX STAN 212	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	CCS	Equivalency of the methods is not confirmed



Sugars (soft white sugar and soft brown sugar)	CODEX STAN 212	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	CCS	Equivalency of the methods is not confirmed
Sugars (white sugar)	CODEX STAN 212	Sulphur dioxide	ICUMSA GS 2/3-35 NMKL 135 EN 1988-2	Enzymatic method	II	CCS	Equivalency of the methods is not confirmed

#### WORKABLE PACKAGE 4- Methods with Incorrections

**ACTIONS SUGGESTED:** Check the methods information, identify other methods when necessary and amend the Codex documents accordingly.

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Bouillons and Consommés (soups and broths)	CODEX STAN 117	Amino nitrogen	AIBP Method No 2/7	Volumetry (modified Van Slyke)	II	CCSB	The correct method is the AIBP No 2/7a. This method is for alfa-amino nitrogen There is the AIBP Method No 2/7b wich is for Ammoniacal Nitrogen
Butter	CODEX STAN 279	Water ("Water content excluding the crystallized water bound to lactose (generally known as "moisture content")	ISO 3727 IDF 80	Gravimetry	I	CCMMP	The correct method is ISO 3727-1 IDF 80-1 The ISO method mentions moisture, non fat solids and fat content in butter
Canned bamboo shoots	CODEX STAN 241	pH ≥ 4.0; 4.0-4.6 (if acid is added)	AOAC 981.12	Potentiometry	I	CCPFV	The commodity/provision is mentioned in CODEX STAN 234 as an exception of the Processed fruits and Vegetables. ("Processed fruits and Vegetables (except canned bamboo shoots, pH determined by AOAC 981.12)"). CODEX STAN 241 mentions also the NMKL 179:2005 (Potentiometry, type II) and ISO 1842:1991 (Potentiometry, type IV)
Canned Stone Fruits	CODEX STAN 242	Drained weight	AOAC 968.30 ISO 2173	Gravimetry	I	CCPFV	The ISO 2173 is for soluble solids
Canned Stone Fruits	CODEX STAN 242	Soluble solids	AOAC 932.14C	Refractometry	I	CCPFV	AOAC 932.14 is for solids in Sugars and Sugar Products/Syrups

Degermed maize (corn) meal and maize (corn) grits	CODEX STAN 155	Protein (Nx6.25)	ICC Method No 105/1	Titrimetry, Kjeldahl digestion	I	CCCPL	The current version of the method is ICC 105/2
Durum wheat semolina and durum wheat flour	CODEX STAN 178	Protein (N x 5.7)	ICC 105/1	Titrimetry, Kjeldahl digestion	I	CCCPL	CODEX STAN 178-91 mentions this method and also ISO 1871 The current version of the method is ICC 105/2
Fats and oils (all)	CODEX STAN 19 Codex Stan 211	Insoluble impurities	ISO 663	Gravimetry	I	CCFO	CODEX STAN 19 and 211 mentions IUPAC 2.604 or ISO 663
Fats and oils (all)	CODEX STAN 19	Matter volatile at 105°C	ISO 662	Gravimetry (open drying)	I	CCFO	CODEX STAN 19 mentions IUPAC 2.601 or ISO 662: 1998. ISO 662 is for moisture and volatile matter content loss in mass undergone by the product on heating at 103 °C ± 2 °C under the conditions specified in that International Standard and CODEX STAN 234 uses 105 °C
Fish oils	CODEX STAN 19	Fatty acid composition	ISO 5508	Gas chromatography	III	CCFO	The ISO 5508 was withdrawn.
Fish sauce	CODEX STAN 302	Amino acid nitrogen	AOAC 920.04 and AOAC 920.03	Determining formaldehyde titration method subtracting by ammoniacal nitrogen (magnesium oxide method)	I	CCFFP	There are methods mentioned in the CODEX STAN 302: "Determination of amino acid nitrogen by determining formaldehyde nitrogen (AOAC 2.066) and subtracting by ammoniacal nitrogen (AOAC 2.065)" - These methods were not found. The AOAC 920.03 is for fertilizer
Fish sauce	CODEX STAN 302	sodium chloride	AOAC 937.09	Titrimetry	IV	CCFFP	There are methods mentioned in CODEX STAN 302: "determination of sodium chloride: FAO 1981, Technical Paper 219 AOAC 937.13 or 976.18 or 976.19." This provision has no type II method
Fish sauce	CODEX STAN 302	sodium chloride	AOAC 976.18	potentiometry	II	CCFFP	CODEX STAN 302 mentions the methods FAO 1981, Technical Paper 219 AOAC 937.13 or 976.18 or 976.19. This provision has no type II method

Fruit juices and nectars	CODEX STAN 247	Isocitric acid-D (Sections 3.2 Quality criteria and 3.3 Authenticity)	IFUMA 54	Enzymatic determination	II	TFFJ	CODEX STAN 247 mentions also the EM 1139
Honey	CODEX STAN 12	Sugars added: detection of corn and cane sugar products.	AOAC 978.17	Carbon isotope ratio mass spectrometry	I	CCS	CODEX STAN 12 mentions AOAC 991.41 internal standard for SCIRA (stable carbon isotope ratio analysis).
Honey	CODEX STAN 12	Sugars added (for sugar profile)	AOAC 998.18	Carbon isotope ratio mass spectrometry	I	CCS	CODEX STAN 12 mentions AOAC 977.20 The method AOAC 998.18 was not found
Infant formula	CODEX STAN 72	Chromium (Section B of CODEX STAN 72-1981 only)	AOAC 2006.03	ICP emission spectroscopy	III	CCNFSDU	Method described for fertilizers.
Infant formula	CODEX STAN 72	Molybdenum (Section B of CODEX STAN 72-1981 only)	AOAC 2006.03	ICP emission spectroscopy	III	CCNFSDU	Method described for fertilizers.
Infant formula	CODEX STAN 72	Selenium	AOAC 2006.03	ICP emission spectroscopy	III	CCNFSDU	Method described for fertilizers.
Infant formula	CODEX STAN 72	Calories (by calculation)	Method described in CAC/Vol IX-Ed.1, Part III	Calculation	I	CCNFSDU	Method not readily available
Milk powders and cream powders	CODEX STAN 207	Water ("Water content excluding the crystallized water bound to lactose (generally known as "moisture content")	ISO 5537 IDF 26	Gravimetry (drying at 87°C)	I	CCMMP	The ISO method mentions moisture.
Named Animal Fats	CODEX STAN 211	GLC ranges of fatty acid composition	ISO 5508 and ISO 12966-2 or AOCS Ce 2-66 and Ce 1e-91 or Ce 1f-96	Gas chromatography of methyl esters	II	CCFO	The methods in CODEX STAN 211 are IUPAC 2.301, 2.302 and 2.304 or ISO 5508/5509. The method AOCS Ce 1e-91 is not available ISO 5508/5509 was withdrawn Only the AOCS Ce 1f-96 method is available
Named Animal Fats	CODEX STAN 211	Refractive index	ISO 6320 or AOCS Cc 7-25	Refractometry	II	CCFO	The methods mentioned in CODEX STAN 211 are IUPAC 2.102 or ISO 6320.

Named Animal Fats	CODEX STAN 211	Relative density (40 0C/water at 20 0C)	ISO/AOCS method for apparent density to be inserted	Pycnometry	II	CCFO	CODEX STAN 211 mentions the IUPAC 2.101, with the appropriate conversion factor.
Named Vegetable Oils	CODEX STAN 210	GLC ranges of fatty acid composition	ISO 5508 and ISO 12966-2; or AOCS Ce 2-66 and Ce 1--62 or Ce 1h-05	Gas chromatography of methyl esters	II	CCFO	There are methods in CODEX STAN 210: ISO 5508: 1990 and 5509: 2000; or AOCS Ce 2-66 (97), Ce 1e-91 (01) or Ce 1f-96 (02). The method 5508 and 5509 were withdrawn. The AOCS Ce 2-66 (97), Ce 1e-91 (01) were not found
Named Vegetable Oils	CODEX STAN 210	Relative density	IUPAC 2.101 with the appropriate conversion factor	Pycnometry	I	CCFO	The IUPAC is not updating methods anymore
Olive Oils and Olive Pomace Oils	CODEX STAN 033	Halogenated solvents, traces	COI/T.20/Doc. no. 8	Gas chromatography	II	CCFO	This method was not found.
Olive Oils and Olive Pomace Oils	CODEX STAN 33	Relative density	IUPAC 2.101, with the appropriate conversion factor	Pycnometry	I	CCFO	The iupac method was not readily available
Peanuts (Cereals, shell-fruits and derived products (including peanuts))	CODEX STAN 193	Sum of aflatoxins B1, B2, G1 and G2	EN 12955 ISO 16050	HPLC with post column derivatization and immunoaffinity column clean up	III	CCCF	BS EN 12955:1999 - Superseded, Withdrawn, Replaced By : BS EN ISO 16050:2011
Pearl millet flour	CODEX STAN 170	Colour	Modern Cereal Chemistry, 6th Ed., D.W. Kent-Jones and A.J. Amos (Ed.), pp. 605-612, Food Trade Press Ltd, London, 1969.	Colorimetry using specific colour grader	IV	CCCPL	The article is not readily available
Pearl millet flour	CODEX STAN 170	Fat, Crude	AOAC 945.38F AOAC 920.39C	Gravimetry (ether extraction)	I	CCCPL	The CODEX STAN 170 mentions these methods and ISO 5986 which is withdrawn. The method AOAC 920.39 is applicable to animal feed

Processed Fruits and Vegetables	STAN 192 STAN 103 STAN 110 STAN 111 STAN 112 STAN 113 STAN 114 STAN 115 STAN 13 STAN 130 STAN 131 STAN 143 STAN 145 STAN 160 STAN 017 STAN 177 STAN 223 STAN 240 STAN 241 STAN 242 STAN 254 STAN 260 STAN 296 STAN 297 STAN 319 STAN 320 STAN 38 STAN 39 STAN 41 STAN 42 STAN 52 STAN 57 STAN 60 STAN 62 STAN 66 STAN 67 STAN 69 STAN 75 STAN 76 STAN 77 STAN 78 STAN 99	Sorbates	NMKL 103/AOAC983.16	Gas chromatography	III	CCPFV/CCFA	The method AOAC 983.16 is for Fish/Fish Homogenate.
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Processed Fruits and Vegetables	STAN 103-1981 STAN 110-1981 STAN 111-1981 STAN 112 - 1981 STAN 113-1981 STAN 114-1981 STAN 115-1981 STAN 13 – 1981/2013 STAN 130 - 1981 STAN 131 - 1981 STAN 143 - 1985 STAN 145 - 1985 STAN 160 - 1987 STAN 017 – 1981 - 2001 STAN 177 – 1991 - 2011 STAN 223 - 2001 STAN 240 - 2003 STAN 241 – 2003 - 2015 STAN 242 - 2003 STAN 254 – 2007 - 2013 STAN 260	Benzoic acid	NMKL 103 or AOAC 983.16	Gas chromatography	III	CCPFV/CCFA	The method AOAC 983.16 is for Fish/Fish Homogenate.
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	- 2007 - 2015 STAN 296 - 2009 STAN 297 - 2009 - 2015 STAN 319 - 2015 STAN 320 - 2015 STAN 38 - 1981 STAN 39 - 1981 STAN 41 - 1981 STAN 42 - 1981 - 1987 STAN 52 - 1981 STAN 57 - 1981 - 2013 STAN 60 - 1981 STAN 62 - 1981 STAN 66 - 1981-2013 STAN 67- 1981 STAN 69 - 1981 STAN 75 - 1981 STAN 76 - 1981 STAN 77 - 1981 STAN 78 - 1981 STAN 99 - 1981					
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Processed Tomato Concentrates	CODEX STAN 57	Lactic Acid	EN 2631	Enzymatic determination	II	CCPFV/CCFA	The EN 2631 method was not found.
Sorghum flour	CODEX STAN 173	Colour	Modern Cereal Chemistry, 6th Ed., D.W. Kent-Jones and A.J. Amos (Ed.), pp. 605-612, Food Trade Press Ltd, London, 1969.	Colorimetry using specific colour grader	IV	CCCPL	The article is not readily available
Sorghum flour	CODEX STAN 173	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	CCCPL	CODEX STAN 173 mentions ICC 105/1 and ISO 1871 The correct version is ICC 105/2
Sorghum grains	CODEX STAN 172	Fat, Crude	AOAC 945.38F, 920.39C	Gravimetry (ether extraction)	I	CCCPL	CODEX STAN 172 mentions the provision FAT and the methods: AOAC 945.38F and 920.39C and ISO 5986 – animal feedingstuff. The ISO 5986 was withdrawn The AOAC 920.39C is for animal feed
Sorghum grains	CODEX STAN 172	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	CCCPL	There are methods in CODEX STAN 172: there are the methods: ICC Method No 105/1 e ISO 1871 The correct version is ICC 105/2
Soy protein products	CODEX STAN 175	Protein	AOAC 955.04D (using factor 6.25)	Titrimetry, Kjeldahl digestion	II	CCVP	AOAC method is for fertilizer
Special foods		Ash	AOAC 942.05	Gravimetry	I	CCNFSDU	Method AOAC 942.05 described for Animal Feed.
Special foods		Calories by calculation	Method described in CAC/VOL IX-Ed.1, Part III	Calculation method	III	CCNFSDU	The method is not readily available This provision has no type II method
Special foods		Carbohydrates	Method described in CAC/VOL IX-Ed.1, Part III	Calculation	III	CCNFSDU	The method is not readily available
Special foods		Protein, crude	Method described in CAC/VOL IX-Ed.1, Part III	Titrimetry, Kjeldahl digestion	I	CCNFSDU	The method is not readily available
Special foods		Dietary fibre, total	AOAC 985.29	Gravimetry (enzymatic digestion)	I	CCNFSDU	There is no CODEX STAN for this commodity
Special foods		Folic acid	AOAC 944.12	Microbioassay	II	CCNFSDU	Method AOAC 944.12 described for Vitamin Preparations
Special foods		Linoleate (in the form of glycerides)	AOAC 922.06; 979.19	Acid hydrolysis and spectrophotometry	III	CCNFSDU/CCFA	Method AOAC 922.06 described for flour.



Special foods		Vitamin A in foods in which carotenes has been added as a source of vitamin A	AOAC 941.15	Spectrophotometry	III	CCNFSDU/CCFA	Method AOAC 941.15 described for Plants/Silages, Plants/Fresh Plant Materials This provision has no type II method
Sugars (fructose)	CODEX STAN 212	Conductivity ash	ICUMSA GS 2/3-17	Conductimetry	I	CCS	The correct method is ICUMSA GS 2/3/9-17
Sugars (fructose)	CODEX STAN 212	pH	ICUMSA GS 1/2/3/4/7/8-23	Potentiometry	I	CCS	Correct method: ICUMSA GS 1/2/3/4/7/8/9-23
Sugars (fructose)	CODEX STAN 212	sulphur dioxide	ISO 5379	ACIDIMETRIC AND NEPHELOMETRY	IV	CCS	Method for Starches and derived products This provision has no type II method
Sugars (glucose syrup and dried glucose syrup)	CODEX STAN 212	sulphur dioxide	ISO 5379	ACIDIMETRIC AND NEPHELOMETRY	IV	CCS	The ISO method is for Starches and derived products This provision has no type II method
Sugars (plantation or mill white sugar)	CODEX STAN 212	Loss on drying	ICUMSA GS 2/1/3-15	Gravimetry	I	CCS	The correct method is ICUMSA GS 2/1/3/9-15
Sugars (powdered sugar)	CODEX STAN 212	Conductivity ash	ICUMSA GS 2/3-17	Conductimetry	I	CCS	The correct method is ICUMSA method GS2/3/9-17
Sugars (powdered sugar)	CODEX STAN 212	Loss on drying	ICUMSA GS 2/1/3-15	Gravimetry	I	CCS	The correct icumsa method is ICUMSA GS 2/1/3/9-15
Sugars (soft brown sugar)	CODEX STAN 212	Sulphated ash	ICUMSA GS 1/3/4/7/8-11	Gravimetry	I	CCS	The correct method is GS 3/4/7/8-11
Sugars (soft white sugar and soft brown sugar)	CODEX STAN 212	Loss on drying	ICUMSA GS 2/1/3-15	Gravimetry	I	CCS	The correct icumsa method is ICUMSA GS 2/1/3/9-15
Sugars (white sugar)	CODEX STAN 212	Conductivity ash	ICUMSA GS 2/3-17	Conductimetry	I	CCS	The correct method is ICUMSA method GS2/3/9-17
Sugars (white sugar)	CODEX STAN 212	Invert sugar	ICUMSA GS 2/3-5	Titrimetry	I	CCS	The correct method is ICUMSA GS2/3/9-5
Sugars (white sugar)	CODEX STAN 212	Loss on drying	ICUMSA GS 2/1/3-15	Gravimetry	I	CCS	The correct ICUMSA method is ICUMSA GS 2/1/3/9-15
Table olives	CODEX STAN 66 CODEX STAN 193	Tin	NMKL 190  EN 15764	AAS (Flame absorption)	II	CCPFV/CCCF	CODEX STAN 66 mentions only the AOAC 980.19 method (AAS, type II)
Vegetable protein products	CODEX STAN 174	Fibre, crude	AACC 32-17	Ceramic fiber filtration	I	CCVP	The AACC method was not found.

Vegetable protein products	CODEX STAN 174	protein	AOAC 955.04D (using factor 6.25)	Titrimetry, Kjeldahl digestion	II	CCVP	AOAC method is for fertilizer
Wheat flour	CODEX STAN 152	Fat acidity	AOAC 939.05	Titrimetry	I	CCCPL	CODEX STAN 152 mentions methods: ISO 7305 and AOAC 939.05
Wheat flour	CODEX STAN 152	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	CCCPL	CODEX STAN 152 mentions the method: ICC 105/1 Method for the Determination of Crude Protein in Cereals and Cereal Products for Food and for Feed (Type I Method) Selenium/Copper catalyst. - or - ISO 1871:1975 The correct version is ICC 105/2
Wheat protein products including wheat gluten	CODEX STAN 163	Fibre, crude	AOAC 962.09	Ceramic fiber filtration	I	CCCPL	CODEX STAN 163 mentions the same method: AOAC 962.09. AOAC method is for animal feed and pet food
Whey powders	CODEX STAN 289	Copper	AOAC 985.35	Atomic absorption spectrophotometry	II	CCMMP	Methods applicable for Baby Foods/Infant Formula, Pet Foods, Baby Foods/Enteral Products The CODEX STAN 289 does not mention this provision
Whey powders	CODEX STAN 289	Moisture, "Free"	ISO 2920 IDF 58	Gravimetry (drying at 88 °C ±2°C)	IV	CCMMP	CODEX STAN 289 doesn't mention "Moisture free", just "Water". The ISO method mentions dry matter in whey cheese. This provision has no type II method
Whole and Decorticated Pearl Millet Grains	CODEX STAN 169	Fat, Crude	AOAC 945.38F AOAC 920.39C	Gravimetry (ether extraction)	I	CCCPL	The CODEX STAN 169 mentions these methods and the ISO 5986 (withdrawn)
Whole maize (corn) meal	CODEX STAN 154	Protein	ICC 105/1	Titrimetry, Kjeldahl digestion	I	CCCPL	The correct is ICC 105/2 CODEX STAN 154 also mentions ISO 1871. The principle mentioned is "Titrimetry, Kjeldahl digestion", type I
All foods	CODEX STAN 228 Codex Stan 193	Lead, cadmium, copper, iron and zinc	NMKL 161 AOAC 991.10	AAS after microwave digestion	III	CCCF/CCMAS	A) Codex general methods B) The provision should be separated because the method principle is different depending on the analyte. C) The method AOAC 991.10 in CODEX STAN 228 is not for food (Cholinesterase Activity in Whole Blood)

Fish and Fishery Products	CODEX STAN 193	Mercury	AOAC 977.15	Flameless atomic absorption spectrophotometry	III	CCFFP/CCCF	CODEX STAN 193 mentions methylmercury in fish
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### WORKABLE PACKAGE 5- Provisions without a Type II method

**ACTIONS SUGGESTED: Check the methods information, identify other methods when necessary and amend the Codex documents accordingly.**

Commodities	CODEX STAN	Provision	Method/ version	Principle	Type	Committee	Remarks
Blend of evaporated skimmed milk and vegetable fat	CODEX STAN 250	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 8968-1 IDF 20-1	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Blend of evaporated skimmed milk and vegetable fat	CODEX STAN 250	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	AOAC 991/20	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method CODEX STAN 234 mentions incorrectly the AOAC method . The correct one is AOAC 991.20
Blend of skimmed milk and vegetable fat in powdered form	CODEX STAN 251	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 8968-1 IDF 20-1	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Blend of skimmed milk and vegetable fat in powdered form	CODEX STAN 251	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	AOAC 991.20	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Blend of sweetened condensed skimmed milk and vegetable fat	CODEX STAN 252	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 8968-1 IDF 20-1	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method

Blend of sweetened condensed skimmed milk and vegetable fat	CODEX STAN 252	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	AOAC 991.20	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Edible casein products	CODEX STAN 290	Acids, free	ISO 5547 IDF 91	Titrimetry (aqueous extract)	IV	CCMMP	This provision has no type II method
Edible Casein Products	CODEX STAN 290	Lactose	ISO 5548 IDF 106	Photometry (phenol and H2SO4)	IV	CCMMP	This provision has no type II method
Edible casein products	CODEX STAN 290	pH	ISO 5546 IDF 115	Electrometry	IV	CCMMP	This provision has no type II method
Edible Casein Products	CODEX STAN 290	Sediment (scorched particles)	ISO 5739 IDF 107	Visual comparison with standard disks, after filtration	IV	CCMMP	This provision has no type II method
Emmental	CODEX STAN 269	Calcium	ISO 8070 IDF 119	Flame atomic absorption	IV	CCMMP	This provision has no type II method
Fish oils	CODEX STAN 19	Fatty acid composition	ISO 12966-2	Gas chromatography	III	CCFO	This provision has no type II method
Fish oils	CODEX STAN 19	Fatty acid composition	AOCS Ce 1b-89	GLC	III	CCFO	This provision has no type II method
Fish oils	CODEX STAN 19	Fatty acid composition	AOCS Ce 1-07	Capillary GLC	III	CCFO	This provision has no type II method The AOCS Ce 1-07 method was not found
Fish oils	CODEX STAN 19	Fatty acid composition	AOCS Ce 2b-11	Alkali hydrolysis	III	CCFO	This provision has no type II method This method is for sample preparation and must be associated with a GC to quantificate the Fatty acid composition. CCMAS should evaluate if this method should be mentioned in a separated line.
Fish oils	CODEX STAN 19	Fatty acid composition	AOCS Ce 1a-13	Capillary GLC	III	CCFO	This provision has no type II method
Fish oils	CODEX STAN 19	Fatty acid composition	AOCS Ce 2-66	Preparation of methyl esters by fatty acids	III	CCFO	This provision has no type II method

Fish oils	CODEX STAN 19	Vitamin A	European Pharmacopeia Monograph on Cod Liver Oil (Type A), monograph 01/2005:1192, with LC end-point 2.2.29	LC	III	CCFO	This provision has no type II method
Fish oils	CODEX STAN 19	Vitamin A	EN 12823-1 (Determination of vitamin A by high performance liquid chromatograph– Part 1: Measurement of all-E-retinol and 13-Z-retinol	LC	III	CCFO	This provision has no type II method
Fish oils	CODEX STAN 19	Vitamin D	EN 12821 (Determination of vitamin D by high performance liquid chromatography – Measurement of cholecalciferol (D3) or ergocalciferol (D2))	LC	III	CCFO	This provision has no type II method
Fish oils	CODEX STAN 19	Vitamin D	NMKL 167 (Cholecalciferol (vitamin D3) and Ergocalciferol (vitamin D2). Determination by HPLC in foodstuffs	LC	III	CCFO	This provision has no type II method

Fish sauce	CODEX STAN 302	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	CCFFP	This provision does not has type II method
Fish sauce	CODEX STAN 302	sodium chloride	AOAC 937.09	Titrimetry	IV	CCFFP	There are methods mentioned in CODEX STAN 302: "determination of sodium chloride: FAO 1981, Technical Paper 219 AOAC 937.13 or 976.18 or 976.19." This provision has no type II method
Fish sauce	CODEX STAN 302	sodium chloride	AOAC 976.18	potentiometry	II	CCFFP	CODEX STAN 302 mentions the methods FAO 1981, Technical Paper 219 AOAC 937.13 or 976.18 or 976.19. This provision has no type II method
Food grade salt	CODEX STAN 150 CODEX STAN 193	Arsenic	EuSalt/AS 015	ICP-OES	IV	CCFA/CCCF	This provision has no type II method
Food grade salt	Codex Stan 193 Codex Stan 150	cadmium	EuSalt/AS 014	Atomic absorption spectrophotometry	IV	CCCF	This provision has no type II method
Food grade salt	CODEX STAN 193 CODEX STAN 150	cadmium	EuSalt/AS 015	ICP-OES	III	CCCF	This provision has no type II method
Food grade salt	Codex STAN 150 CODEX STAN 193	lead	EuSalt/AS 013	Atomic absorption spectrophotometry	IV	CCFA/CCCF	This provision has no type II method
Food grade salt	Codex STAN 150 Codex Stan 193	lead	EuSalt/AS 015	ICP-OES	III	CCFA/CCCF	This provision has no type II method

Foods with low-sodium content (including salt substitutes)	Codex Stan 53	Silica (colloidal, calcium silicate)	AOAC 950.85N	Gravimetry	IV	CCNFSDU	This provision has no type II method Method AOAC 950.85 described for cosmetics/face powders.
Fruit juices and nectars	CODEX STAN 247	Benzoic acid as a marker in orange juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	AOAC 994.11	HPLC	III	TFFJ/CCFA	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Carbon dioxide (additives and processing aids)	IFU Method No 42	Titrimetry (back-titration after precipitation)	IV	TFFJ/CCFA	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Cellobiose	IFUMA 4	Capillary gas chromatography	IV	TFFJ	This provision has no type II method.
Fruit Juices and Nectars	CODEX STAN 247	HFCS & HIS in apple juice (permitted ingredients)	Determination of HFCS & HIS by Capillary GC method JAOAC 84, 486 (2001)	CAP GC Method	IV	TFFJ	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Malic acid (additives)	AOAC 993.05	Enzymatic determination and HPLC	III	TFFJ/CCFA	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Naringin and neohesperidin in orange juice (Sections 3.2 Quality criteria and 3.3 Authenticity)	AOAC 999.05	HPLC	III	TFFJ	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Preservatives in fruit juices (sorbic acid and its salts)	ISO 5519	Spectrometry	III	TFFJ	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Proline by photometry – non-specific determination (Sections 3.2 Quality criteria and 3.3 Authenticity)	EN 1141; IFUMA 49	Photometry	I	TFFJ	This provision has no type II method

Fruit juices and nectars	CODEX STAN 247	Quinic, malic & citric acid in cranberry juice cocktail and apple juice (permitted ingredients and additives)	Determination of quinic, malic and citric acid in cranberry juice cocktail and apple juice AOAC 986.13	HPLC	III	TFFJ/CCFA	This provision has no type II method
Fruit juices and nectars	CODEX STAN 247	Vitamin C (dehydro-ascorbic acid and ascorbic acid) (Sections 3.2 Quality criteria and 3.3 Authenticity)	AOAC 967.22	Microfluorometry	III	TFFJ	This provision has no type II method
Halwa Tehenia	CODEX STAN 309R	Acidity	AOAC 924.53, AOAC 942.15	Titrimetry	IV	CCNEA	This provision has no type II method The AOAC 924.53 method was not found.
Halwa Tehenia	CODEX STAN 309R	Sugars	ISI 28-1e	Titrimetry	IV	CCNEA	This provision has no type II method
Honey	CODEX STAN 12	Diastase activity	IHC Method for Determination of Diastase activity with Phadebas, 2009 except that the incubation time should be increased from 15 to 30 minutes. AOAC 958.09	Spectrophotometry	IV	CCS	This provision has no type II method CODEX STAN 234 does not mention the AOAC 958.09 method
Infant formula	CODEX STAN 72	Total phospholipids	AOCS Ja7b-91	Gas chromatography with suitable extraction and preparation procedures	III	CCNFSDU	This provision has no type II method This method is for Determination of Lecithin Phospholipids by HPLC
Infant formula	CODEX STAN 72	Chloride	AOAC 986.26	Potentiometry	III	CCNFSDU	This provision has no type II method
Meat Products	CODEX STAN 192	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	CCPMPP/CCFA	This provision has no type II method
Meat Products	CODEX STAN 192	Nitrates and/or Nitrites	EN 12014-4 NMKL 165	Ion-exchange chromatographic method	III	CCPMPP/CCFA	This provision has no type II method



Milk powders and cream powders	CODEX STAN 207	Scorched particles	ISO 5739 IDF 107	Visual comparison with standard disks, after filtration	IV	CCMMP	This provision has no type II method
Natural Mineral Waters	CODEX STAN 108	sulphates	ISO 9280	Gravimetry	III	CCNMW	This provision has no type II method CODEX STAN 108 does not mention this provision. labelling purpose?
Natural Mineral Waters	CODEX STAN 108	sulphide	Handb. Spurenanal. 1974		IV	CCNMW	This provision has no type II method CODEX STAN 108 does not mention this provision. Method available?
Reduced fat blend of evaporated skimmed milk and vegetable fat	CODEX STAN 250	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 8968-1 IDF 20-1	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Reduced fat blend of evaporated skimmed milk and vegetable fat	CODEX STAN 250	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	AOAC 991.20	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	CODEX STAN 251	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 8968-1 IDF 20-1	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	CODEX STAN 251	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	AOAC 991.20	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	CODEX STAN 252	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	ISO 8968-1 IDF 20-1	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method

Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	CODEX STAN 252	Milk protein in MSNF ("Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose")	AOAC 991.20	Titrimetry (Kjeldahl)	IV	CCMMP	This provision has no type II method
Smoked Fish, Smoke-Flavoured fish and Smoke-dried fish	CODEX STAN 311	Water activity	NMKL 168 ISO 21807	Electrometry	III	CCFFP	This provision has no type II method
Special foods	not found	Calcium	AOAC 984.27	ICP emission spectrometry	III	CCNFSDU	This provision has no type II method
Special foods		Calories by calculation	Method described in CAC/VOL IX-Ed.1, Part III	Calculation method	III	CCNFSDU	The method is not readily available This provision has no type II method
Special foods	not found	Linoleate (in the form of glycerides)	AOAC 922.06; 969.33; 963.22	Acid hydrolysis, preparation of methyl esters and gas chromatography	II	CCNFSDU/CCFA	Multiple type II method Method AOAC 922.06 described for flour. Method AOAC 969.33 described for Oils and Fats. Method AOAC 963.22 described for Oils and Fats.
Special foods	not found	Vitamin A in foods in which carotenes has been added as a source of vitamin A	AOAC 941.15	Spectrophotometry	III	CCNFSDU/CCFA	Method AOAC 941.15 described for Plants/Silages, Plants/Fresh Plant Materials This provision has no type II method
Sugars (fructose)	CODEX STAN 212	sulphur dioxide	ISO 5379	ACIDIMETRIC AND NEPHELOMETRY	IV	CCS	Method for Starches and derived products This provision has no type II method
Sugars (glucose syrup and dried glucose syrup)	CODEX STAN 212	sulphur dioxide	ISO 5379	ACIDIMETRIC AND NEPHELOMETRY	IV	CCS	The ISO method is for Starches and derived products This provision has no type II method
Whey powders	CODEX STAN 289	Ash	ISO 5545 IDF 90	Gravimetry (ashing at 825 °C )	IV	CCMMP	This provision has no type II method
Whey powders	CODEX STAN 289	Moisture, "Free"	ISO 2920 IDF 58	Gravimetry (drying at 88 °C ±2°C)	IV	CCMMP	CODEX STAN 289 doesn't mention "Moisture free", just "Water". The ISO method mentions dry matter in whey cheese. This provision has no type II method

## APPENDIX IV

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