



JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING

44th Session

Virtual

5 – 8 May and 14 May 2025

REVIEW OF METHODS OF ANALYSIS IN CXS 234: FRUIT JUICES WORKABLE PACKAGE

(Prepared by Germany)

Codex Members and Observers wishing to submit comments on the recommendations in this document should do so as instructed in CL 2025/16-MAS available on the Codex webpage/Circular Letters: <https://www.fao.org/fao-who-codexalimentarius/resources/circular-letters/en/>

INTRODUCTION

1. The 42nd Session of the Codex Committee on Methods of Analysis and Sampling (CCMAS42) (2023) agreed to start the review of methods in the fruit juices package as part of its ongoing work on the review and update of the *Recommended methods of analysis and sampling* (CXS 234-1999). CCMAS42 agreed to establish an electronic working group (EWG) chaired by Germany, and working in English, to review the package and proposals for consideration by CCMAS43 (2024).¹
2. The EWG was not timely initiated for CCMAS43, did not meet and therefore, no further results were presented to that session.
3. CCMAS43 therefore agreed to re-establish the EWG chaired by Germany, and working in English, to review the package and prepare proposals for consideration by CCMAS44 (2025).¹
4. CCMAS42 recalled that the work of the review of methods in CXS 234-1999 is to remove inconsistencies, make editorial corrections, check if the methods are still fit for purpose and to look at the typing. To ease the work, new methods should not be considered in the EWG unless directly related to finding replacement methods for those no longer fit-for-purpose.
5. CCMAS reminded Members and Observers that:
 - they could present new methods for provisions in standards to active commodity committees for their consideration and submission to CCMAS as part of the endorsement process; or
 - if the committee is adjourned *sine die*, new methods could be submitted directly to CCMAS for review by the physical working group (PWG) on endorsement.

EWG PROCESS AND DISCUSSION

6. The EWG was initiated in June 2024. 24 Members and one Observer registered for the EWG and the list of participants is presented in Appendix III.
7. In preparing for the EWG, the Chair of the EWG elaborated working documents based on the following steps:
 - Listing methods for fruit juices from the CXS 234-1999.
 - Checking the methods for updates and changes.
8. CEN/TC 174 - fruit and vegetables juices – methods of analysis responsible for the EN methods listed (30 in total) in CXS 234-1999 is inactive and was disbanded. No other TC in CEN was able to take up the work on the EN standards for fruit juices and nectars. Therefore, in November 2023, CEN voted to disband/inactivate the methods. Therefore, the methods are no longer being maintained by the background technical committee.

¹ REP24/MAS paragraph 29

9. Currently the methods are still available for purchase at different standard setting bodies.
10. An updated table of methods was prepared on the basis of the *General standard for fruit juices and nectars* (CXS 247-2005). The table was updated and presented to the EWG members for comments.
11. The comments were reviewed and included in Appendices I and II, under the comment column of the method tables. Appendix I contains proposed changes that are ready for consideration by CCMAS with a view for endorsement. Appendix II contains proposed changes for which further discussion is needed with the working group on endorsement of methods of analysis and sampling and CCMAS .
12. The year of the methods is currently included in the table for transparency. As per the format already adopted, CXS 234-1999 lists methods without date of release. Therefore, the year of release would be removed from the methods and will not be included in CXS 234-1999 upon adoption of the methods.

ITEMS FOR FURTHER CONSIDERATION

13. The methods ENV 12142 (1996) for determining the stable hydrogen isotope ratio of water and ENV 12141 (1996) for determining the stable oxygen isotope ratio of water (Sections 3.2 Quality Criteria and 3.3 Authenticity) have been withdrawn because the committee(s) responsible have been disbanded. Therefore, these relevant provisions to determine the quality and authenticity of fruit juices and nectars are no longer represented by an available method. But IFU will shortly publish methods based on the CEN-method. CCMAS should decide if the provision needs to be deleted, can be put on hold until the IFU methods are published, or new methods should be endorsed via the method endorsement process.
14. The method IFU 42 (1976) for determining the carbon dioxide content (Section 4 Additives and Section 5 Processing aids) is no longer available by IFU. CCMAS should decide if the provision needs to be deleted, or a new method should be endorsed via the method endorsement process.

RECOMMENDATIONS

15. CCMAS44 is invited to consider:
 - i. Appendix I and endorse the proposed changes to CXS 234-1999; and
 - ii. the items for further consideration in Appendix II and in paragraphs 13 – 14; and to provide guidance on the points raised under this section.

PROPOSED CHANGES TO CXS 234-1999 FOR CCMAS' ENDORSEMENT

For comments through CL 2025/16-MAS

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Ascorbic acid-L	CXS 247-2005 (section 4 Additives)	IFU 17a (1995) (2022);	High performance liquid chromatography (HPLC)	II	Updated version
Fruit juices and nectars	Ascorbic acid-L	CXS 247-2005 (section 4 Additives)	AOAC 967.21 (1967)	Indophenol method	III	unchanged
Fruit juices and nectars	Ascorbic acid-L	CXS 247-2005 (section 4 Additives)	ISO 6557-1:1995	Fluorescence spectrometry (reference method)	IV I	Unchanged
Fruit juices and nectars	Cellobiose	CXS 247-2005	IFU Recommendation No. 4 October 2000	Capillary gas chromatography	IV	Unchanged
Fruit juices and nectars	Citric acid	CXS 247-2005 (section 4 Additives)	AOAC 986.13 (1996)	High performance liquid chromatography (HPLC)	II	Unchanged
Fruit juices and nectars	Citric acid	CXS 247-2005 (section 4 Additives)	IFU 22 (1985) (2005)	Enzymatic determination	III	Updated version of IFU Method
Fruit juices and nectars	Glucose-D and fructose-D	CXS 247-2005 (Section 3.1.2 Permitted ingredients)	EN 1140 IFU 55 (1985) (2005)	Enzymatic determination	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Malic acid (additives)	CXS 247-2005 (Sections 4 Additives)	AOAC 993.05 (1997)	Enzymatic determination and High performance liquid chromatography (HPLC)	III	Unchanged
Fruit juices and nectars	Malic acid-D	CXS 247-2005	EN 12138 IFU 64 (1995) (2005)	Enzymatic determination	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Malic acid-L	CXS 247-2005	EN 1138 IFU 21 (1985) (2004) (2005)	Enzymatic determination	II	EN method withdrawn, Updated version of IFU Method

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Pectin	CXS 247-2005 (Section 4 Additives)	IFU 26 (1964/1996) (2012)	Precipitation/photometry	I	Updated version of IFU Method
Fruit juices and nectars	Benzoic acid and its salts; sorbic acid and its salts	CXS 247-2005	IFU 63 (1995) (2005) NMKL 124 (1997)	High performance liquid chromatography (HPLC)	II	Updated version of IFU Method
Fruit juices and nectars	Saccharin	CXS 247-2005	NMKL 122 (1997)	Liquid chromatography	II	unchanged
Fruit juices and nectars	Sucrose	CXS 247-2005 (Section 3.1.2 Permitted ingredients)	EN 12146 IFU 56 (1985/1998) (2005)	Enzymatic determination	III	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Sucrose	CXS 247-2005 (Section 3.1.2 Permitted ingredients)	EN 12630 IFU 67 (1996) (2005) NMKL 148 (1993)	High performance liquid chromatography (HPLC)	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Sulphur dioxide	CXS 247-2005 (Section 4 Additives)	NMKL 135 (1990)	Enzymatic determination	III	Unchanged
Fruit juices and nectars	Tartaric acid in grape juice	CXS 247-2005 (Section 4 Additives)	EN 12137 (1997) IFU 65 (1995) (2005)	High performance liquid chromatography (HPLC)	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Total nitrogen	CXS 247-2005	EN 12135 IFU 28 (1991) (2005)	Digestion/titration	I	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Acetic acid (acetate)	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12632 IFU 66 (1996) (2016) (2019)	Enzymatic determination	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Alcohol (ethanol)	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 52 (1996) (2005)	Enzymatic determination	II	Updated version of IFU Method

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Anthocyanins	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 71 (1998) (2023)	High performance liquid chromatography (HPLC)	I	Updated version of IFU Method
Fruit juices and nectars	Beet sugar	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 995.17 (1998)	SNIF-NMR	II	Unchanged
Fruit juices and nectars	Carotenoid, total/individual groups	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12136 IFU 59 (1994) (2008)	Spectrophotometry	I	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Centrifugable pulp	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12134 IFU 60 (1994) (2005)	Centrifugation / % value	I	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Chloride (expressed as sodium chloride)	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12133 IFU 37 (1994) (2005)	Electrochemical titrimetry	III	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Essential oils	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 968.20 (1969) IFU 45 (2005)	(Scott) distillation, titration	I	Unchanged; But are methods identical?
Fruit juices and nectars	Fermentability	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 18 (1974) (1998)	Microbiological method	I	Updated version of IFU Method
Fruit juices and nectars	Formol number	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1133 IFU 30 (1984) (2005)	Potentiometric titration	I	EN method withdrawn, Updated version of IFU Method

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Free amino acids	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12742 IFU 57 (1989) (2005)	Liquid chromatography	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Fumaric acid	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 72 (1998)	High performance liquid chromatography (HPLC)	II	Unchanged
Fruit juices and nectars	Gluconic acid	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 76 (2004) (2006)	Enzymatic determination	II	Updated version of IFU Method
Fruit juices and nectars	Glycerol	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 77 (2001) (2005)	Enzymatic determination	II	Updated version of IFU Method
Fruit juices and nectars	Hesperidin and naringin	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12148 IFU 58 (1991) (2005)	High performance liquid chromatography (HPLC)	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Hydroxymethylfurfural	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 69 (1996) (2005)	High performance liquid chromatography (HPLC)	II	Updated version of IFU Method
Fruit juices and nectars	Hydroxymethylfurfural	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	ISO 7466:1986	Spectrometry	III	unchanged
Fruit juices and nectars	Isocitric acid-D	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 54 (1984) (2005)	Enzymatic determination	II	Updated version of IFU Method

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Lactic acid-D and L	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12634 IFU 53 (1983/1996) (2005)	Enzymatic determination	II	EN method withdrawn, Updated version of IFU Method
Apple juice	L-malic/total malic acid ratio – to detected added D-malic acid	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 993.05 (1997)	Enzymatic determination and High performance liquid chromatography (HPLC)	II	Unchanged, but only validated for apple juice
Fruit juices and nectars	pH-value	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	NMKL 179 (2005)	Potentiometry	II	unchanged
Fruit juices and nectars	Phosphorus/phosphate	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1136 IFU 50 (1983) (2005)	Photometric determination	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Proline	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1144 IFU 49 (1983) (2005)	Photometry	I	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Relative density	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1134 IFU 1 (1989) (2005) & IFU Method No. General sheet (1971)	Pycnometry	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Sodium, potassium, calcium, magnesium	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1134 IFU 33 (1984) (2005)	Atomic Absorption Spectroscopy	II	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Sorbitol-D	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 62 (1995) (2005)	Enzymatic determination	II	Updated version of IFU Method

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Starch	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 925.38 (1925) IFU 73 (2000)	Colorimetric	I	unchanged
Fruit juices and nectars	Titrateable acids	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12147 IFU 03 (1968) (2017) ISO 750:1998	Titrimetry	I	EN method withdrawn, Updated version of IFU Method; ISO method has 2 methods: Potentiometry for reference method Titrimetry for the routine method
Fruit juices and nectars	Total dry matter at 70°C	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 12145 IFU 61 (1991) (2005)	Gravimetric determination Gravimetry	I	EN method withdrawn, Updated version of IFU Method
Fruit juices and nectars	Total solids (Microwave oven drying)	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 985.26 (2001)	Gravimetric determination Gravimetry	I	unchanged
Fruit juices and nectars	Vitamin C	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 14130 (2003)	High performance liquid chromatography (HPLC)	II	EN method withdrawn
Fruit juices and nectars	Vitamin C (dehydro-ascorbic acid and ascorbic acid)	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 967.22 (1968)	Microfluorometry	III	unchanged

Appendix IIISSUES FOR FURTHER CONSIDERATION

For comments through CL 2025/16-MAS

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Ascorbic acid-L	CXS 247-2005 (section 4 Additives)	AOAC 967.21 (1967) ISO 6557-2:1995	A) Titrimetry B) (for strongly colored) Spectrometry	III?	Validation data is not available? Type of method?
Fruit juices and nectars	Ascorbic acid-L	CXS 247-2005 (section 4 Additives)	IFU 17b (2024)	Iodine method	III	Updated version of IFU Method; different from AOAC and ISO method, separate listing
Fruit juices and nectars	Carbon dioxide	CXS 247-2005 (section 4 Additives and 5 Processing aids)	IFU 42 (1976)	Titrimetry	IV	Not available anymore
Fruit juices and nectars	High Fructose Corn Syrup and Hydrolyzed Inulin Syrup in apple juice (permitted ingredients)	CXS 247-2005	Determination of HFCS & HIS by Capillary GC method AOAC 84, 486 (2001)	GC Method Gaschromatography	IV	Unchanged, but no official AOAC method
Apple juice	Malic acid-D in apple juice	CXS 247-2005	AOAC 995.06 (1998)	High performance liquid chromatography (HPLC)	II	Unchanged, but method is only validated for apple juice
Fruit juices and nectars	Benzoic acid and its salts	CXS 247-2005	ISO 5518:1978 2007-2011 ISO 6560:1983	Spectrometry	III	Updated ISO Method; Not identical methods, 6560 is for fruit/vegetable products with >200 mg/L (or kg). Which is Type II, or are these Type III, with NMKL/IFU in above line being identified as Type II? They are on different lines and do not have exactly the same provision. No validation information included

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Fruit juices and nectars	Preservatives in fruit juices (sorbic acids and its salts)	CXS 247-2005	ISO 5519:1978-2008 2011	Spectrometry	III	Updated ISO Method; No validation information, 2 techniques within the method
Fruit juices and nectars	Quinic, malic & citric acid in cranberry juice cocktail and apple juice (permitted ingredients and additives)	CXS 247-2005 (Section 3.2 Permitted ingredients and 4 Additives)	AOAC 986.13 (1986)	High performance liquid chromatography (HPLC)	III	Unchanged, but scope of method is cranberry juice cocktail and apple juice; Should it be Type II as indicated above for citric acid?
Fruit juices and nectars	Soluble solids	CXS 247-2005	AOAC 983.17 (2000) EN 12143 IFU 8 (1994) (2017) ISO 2173:2003-2011	Indirect by refractometry	I	EN method withdrawn, Updated version of IFU Method; need to verify if ISO, AOAC and IFU method are equivalent
Fruit juices and nectars	Sulphur dioxide	CXS 247-2005 (Section 4 Additives)	Optimized Monier Williams AOAC 990.28 (2005) IFU 7A (2000) (2018) NMKL 132 (1989)	Titrimetry after distillation	II	Updated version of IFU Method; need to verify if AOAC, NMKL and IFU method are equivalent
Fruit juices and nectars	Sulphur dioxide	CXS 247-2005 (Section 4 Additives)	ISO 5522:1984-1995 ISO 5523:1984-1995	Titrimetry after distillation	III	Updated version; Not identical, if disputes, ISO 5522 is supposed to be used as per ISO 5523
Fruit juices and nectars	Ash	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1135 IFU 9 (1989) (2005): 500-550°C AOAC 940.26 (1940): 525°C	Gravimetry	I	EN method withdrawn, IFU method updated –There are multiple temperatures for ash. IFU and AOAC are not identical given the different temperatures. Which is the Type I method?

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Orange juice	Benzoic acid	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 994.11 (1964)	High performance liquid chromatography (HPLC)	III	Unchanged, but method is only validated for orange juice; Could it be a Type II, given that it is only for orange juice? Benzoic acid and its salts using HPLC for fruit juices was Type II
Fruit juices and nectars	C ¹³ /C ¹² ratio of ethanol derived from fruit juices	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	JAOAC 79. No. 1 1996, 62-72	Stable isotope mass spectrometry	II	Unchanged; discuss calculation
Fruit juices and nectars	Carbon stable isotope ratio	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 981.09 (1997) JAOAC 64, 85 (1981)	Stable isotope mass spectrometry	II	Unchanged; discuss calculation
Fruit juices and nectars	Carbon stable isotope ratio	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 982.21 (1997)	Stable isotope mass spectrometry	II	Unchanged; discuss calculation
Vegetables juice	Chloride	CXS 247-2005	AOAC 971.27 (1976) ISO 3634:1979/1995	Titration	II	Unchanged; But are methods identical?
Citrus fruit	Essential oils in citrus fruit	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	ISO 1955:1982/1995	Distillation and direct reading of the volume determination	I	Unchanged, but method is only validated for citrus fruit; Can this remain as a separate Type I, since it is only for citrus? There was a note about multiple Type Is in CXS 247 for these methods
Fruit juices and nectars	Glucose, fructose, saccharose	CXS 247-2005 (Section 3.1.2 Permitted ingredients)	EN 12630 IFU 67 (1996) (2005) NMKL 148 (1993)	High performance liquid chromatography (HPLC)	II	EN method withdrawn, IFU method updated; need to verify if NMKL and IFU method are equivalent; Should this be revised to read: Glucose, fructose, sucrose?

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Apple juice	High Fructose Corn Syrup and Hydrolyzed Inulin Syrup	CXS 247-2005 (Section 3.1.2 Permitted ingredients)	JAOAC 84, 486 (2001)	Capillary gas chromatography (CAP GC Method) Gaschromatography	IV	Unchanged, but only validated for apple juice; Type of method? Journal reference not official method
Orange juice	Naringin and Neohesperidin	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 999.05 (2002)	High performance liquid chromatography (HPLC)	III	Unchanged, but only validated to orange juice; Type?
Fruit juices and nectars	pH-value	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	EN 1132 IFU 11 (1989) (2015) ISO 1842:1994-1995	Potentiometry	IV	EN method withdrawn; Updated version of IFU Method; need to verify if ISO and IFU method are equivalent
Fruit juices and nectars	Relative density	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	IFU 01A (2005)	Densitometry	III	Updated version of IFU Method; Relative density is Type I for fats and oils, need only one Type I method
Pulp of fruit juices and nectars	Stable carbon isotope ratio	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	ENV 13070 (1998) Analytica Chimica Acta 340 (1997)	Stable isotope mass spectrometry	II	EN method withdrawn; will shortly be published as IFU method (based on CEN); Calculation? Type?
Fruit juices and nectars	Stable carbon isotope ratio of sugars from fruit juices	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	ENV 12140 (1996) Analytica Chimica Acta 271 (1993)	Stable isotope mass spectrometry	II	EN method withdrawn; will shortly be published as IFU method (based on CEN); Calculation? Type?
Fruit juices and nectars	Stable hydrogen isotope ratio of water	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	ENV 12142 (1997)	Stable isotope mass spectrometry	II	EN method withdrawn, no method available; Calculation? Type?
Fruit juices and nectars	Stable oxygen isotope ratio of water	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	ENV 12141 (1997)	Stable isotope mass spectrometry	II	EN method withdrawn, no method available; will shortly be published as IFU method (based on CEN); Calculation? Type?

Commodity	Provision	Codex Standard	Method	Principle	Type	Comment
Orange juice	Sugar beet derived syrups in frozen concentrated orange juice	CXS 247-2005 (Sections 3.2 Quality Criteria and 3.3 Authenticity)	AOAC 992.09 (1997)	Oxygen isotope ratio analysis ($\delta^{18}\text{O}$ in water)	I	Unchanged; Journal reference; Calculation? Type?

LIST OF PARTICIPANTS**CHAIR****Germany**

Dr. Stephan G Walch
Chemisches und Veterinäruntersuchungsamt Karlsruhe

MEMBER NATIONS AND MEMBER ORGANIZATIONS
ÉTATS MEMBRES ET ORGANISATIONS MEMBRES
ESTADOS MIEMBROS Y ORGANIZACIONES MIEMBROS

ALGERIA - ALGÉRIE – ARGELIA

Nassira KHELLAFI
Ministry of Commerce

AUSTRALIA - AUSTRALIE

Richard COGHLAN
National Measurement Institute
Neil Shepherd

BRAZIL - BRÉSIL - BRASIL

Ligia Lindner Schreiner
Brazilian Health Regulatory Agency
Ana Claudia Marquim Firmo De Araujo
Brazilian Health Surveillance Agency

CANADA - CANADÁ

Thea RAWN
Health Canada

CHINA - CHINE

Wei Wang

COSTA RICA

Karla ROJAS
Servicio Nacional de Salud Animal
Melina Flores RODRIGUEZ
Ministry of Economy, Industry and Commerce

EGYPT - ÉGYPTE - EGIPTO

Mariam Barsoum Onsy

FRANCE - FRANCIA

Jean-Luc DEBORDE
Ministry of Agriculture

GHANA

Doreen Afi Gyau Koranteng
Ghana Standards Authority

GUATEMALA

Nelson Ruano

HUNGARY - HONGRIE - HUNGRÍA

Boglárka POCSAI
National Food Chain Safety Office
Nikoletta Farago

Krisztina Bakó-Frányó

INDIA - INDE

Anju THAKUR
Department of Science Technology &
Environment

Dr Ajit Dua
Department of Science Technology &
Environment

IRAN (ISLAMIC REPUBLIC OF) - IRAN
(RÉPUBLIQUE ISLAMIQUE D') - IRÁN
(REPÚBLICA ISLÁMICA DEL)

Samaneh Eghtedari

MOROCCO - MAROC - MARRUECOS

Dr. Lalla Chrif ALAOUI
Agro Analyzes Maroc

Mounir RAHLAOUI
MOROCCO FOOD EX

Bouchra MESSAOUDI
Office National de Sécurité Sanitaire Des Produits
Alimentaires

NEW ZEALAND - NOUVELLE-ZÉLANDE -
NUEVA ZELANDIA

Susann MORRIS
Ministry for Primary Industries

NIGERIA - NIGÉRIA

Ibrahim Yahaya

POLAND - POLOGNE - POLONIA

Agnieszka WANDEL
Agricultural and Food Quality Inspection
Laboratory in Poznan

PORTUGAL

Elsa M Gonçalves

REPUBLIC OF KOREA - RÉPUBLIQUE DE
CORÉE - REPÚBLICA DE COREA

Youngjun KIM
Ministry of Food and Drug safety

HyunJung Kim
Ministry of Agriculture, Food and Rural Affairs

Hwang Kiseon

SAUDI ARABIA - ARABIE SAOUDITE - ARABIA SAUDITA

Nimah M. Baqadir
Saudi Food and Drug Authority

Abdulaziz A. Al Qaud
Saudi Food and Drug Authority

Mubarak M. AL-Garaiwi
Saudi Food and Drug Authority

Abdullah A. Al Sayari
Saudi Food and Drug Authority

Mohrah A. Alenazi
Saudi Food and Drug Authority

SINGAPORE - SINGAPOUR - SINGAPUR

Ivan NG
Singapore Food Agency

Ken LEE
Singapore Food Agency

SPAIN - ESPAGNE - ESPAÑA

María Muñoz Izquierdo
Research and Quality Control Center – Ministry of Social Rights, Consumer Affairs and 2030 Agenda

THAILAND - THAÏLANDE - TAILANDIA

Rungrassamee Mahakhaphong
Ministry of Agriculture and Cooperatives

Kittiporn Phuangsuk
Ministry of Agriculture and Cooperatives

Chitrlada Booncharoen
Ministry of Agriculture and Cooperatives

UNITED STATES OF AMERICA ÉTATS-UNIS D'AMÉRIQUE - ESTADOS UNIDOS DE AMÉRICA

Patrick Gray

OBSERVERS - OBSERVATEURS – OBSERVADORES

**NON-GOVERNMENTAL ORGANIZATIONS –
ORGANISATIONS NON GOUVERNEMENTALES –
ORGANIZACIONES NO GUBERNAMENTALES**

INTERNATIONAL FRUIT AND VEGETABLE JUICE ASSOCIATION (IFU)

Tatiana Campos

Dr. David Hammond

Aintzane Esturo