CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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**Agenda item 3**

**MAS44/CRD05**
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**ORIGINAL LANGUAGE ONLY**

**JOINT FAO/WHO FOOD STANDARDS PROGRAMME**

**CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING**

**44th Session**
**Virtual**
**5-8 May and 14 May 2025**

**Information submitted by AOAC, IDF and ISO**

## Information submitted on infant and follow-up formula products

### Executive Summary

This document presents recommendations and supporting information from AOAC INTERNATIONAL (AOAC), the International Standardization Organization (ISO), and the International Dairy Federation (IDF) regarding infant and follow-up formula methods of analysis topics to be discussed during the 44th Session of the Codex Committee on Methods of Analysis and Sampling (CCMAS44).

Recommendations to CCMAS44

AOAC/ISO/IDF recommends CCMAS44 to take the following actions:

1. endorse the methods listed in Table 4 as Type II/Type III methods for the determination of nutrients in infant formula (CXS 72-1981, Section A) and follow-up formula (CXS 156-1987, Section A).
2. revoke/retypef methods for follow-up formula currently listed in CXS 234-1999 as summarized in Table 5.

**Agenda Item #3: Endorsement of Methods of Analysis Provisions and Sampling Plans in Code Standards**

**Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU44)**

**Methods of analysis in the CXS 72-1981, Section A and CXS 156-1987, Section A**

1. CCNFSDU44 agreed to request CCMAS to:

Endorse the methods listed in Table 1 for review, (re)typing, revocation and endorsement as Type II/Type III methods for the determination of nutrients in infant formula (CXS 72-1981, Section A) and follow-up formula (CXS 156-1987, Section A).

Since 2015, the Codex Alimentarius Commission has adopted multiple analytical methods for inclusion in CXS 234-1999 to verify compliance with provisions for nutrients in infant formula as referred to in CXS 72-1981, section A, on infant formula. Table 1 includes the links to the CCMAS reports where these methods have been endorsed. As agreed by the AOAC SPIFAN Nutrient Expert Review Panel in June 2024, these methods are also fit for purpose to verify compliance of these nutrients in follow-up formula as referred to in CXS 156-1987 because of similarities between infant and follow-up formulas, specifically regarding definition and composition.

2. CCNFSDU44 agreed to request CCMAS to endorse the method for crude protein in follow-up formula as Type I method.

The Standard for follow-up formula for older infants and product for young children (CXS 156-1987) contains a provision for protein with reference to a nitrogen-to-protein conversion factor but the Recommended Methods of Analysis and Sampling (CXS 234-1999) does not refer to any method for follow-up formula. Table 1 includes a link to the CCMAS report where methods have been endorsed for a provision on crude protein in CXS 72-1981, section A, on infant formula. considering the similarities between infant and follow-up formulas, specifically regarding definition and composition, it is recommended to endorse the same methods for the provision on crude protein in follow-up formula (CXS 156-1987, Section A).

Table 1: Methods for review, (re)typing, revocation and endorsement as Type II/Type III methods for the determination of nutrients in infant formula (CXS 72-1981, Section A) and follow-up formula (CXS 156-1987, Section A) with links to the CCMAS reports where methods in the past have been endorsed for provisions on nutrients in infant formula as referred to in CXS 72-1981, section A.

| Commodity | Provision | Method | Principle | Type | Endorsed by CCMAS for Infant formula |
|---|---|---|---|---|---|
| Follow-up formula | Vitamin A | AOAC 2012.10 / ISO 20633 | HPLC-UV | II | CCMAS37 REP16/MAS |
| | Vitamin E | AOAC 2012.10 / ISO 20633 | HPLC | II | CCMAS37 REP16/MAS |
| | Vitamin D | AOAC 2016.05 / ISO 20636 | LC-MS | II | CCMAS39 REP18/MAS |
| | Thiamine | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II | CCMAS41 REP21/MAS |
| | Riboflavin | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II | CCMAS41 REP21/MAS |
| | Niacin | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II | CCMAS41 REP21/MAS |
| | Vitamin $B_6$ | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II | CCMAS41 REP21/MAS |
| | Vitamin $B_{12}$ | AOAC 2011.10 / ISO 20634 | HPLC | II | CCMAS37 REP16/MAS |
| | | AOAC 2014.02 | LC-UV | III | CCMAS42 REP23/MAS |
| | Pantothenic acid | AOAC 2012.16 / ISO 20639 | UHPLC-MS/MS | II | CCMAS37 REP16/MAS |
| | Folic Acid# | AOAC 2011.06/ ISO 20631 | LC-MS/MS | II | CCMAS40 REP19/MAS |
| | Vitamin C | AOAC 2012.22 / ISO 20635 | HPLC-UV | II | CCMAS38 REP17/MAS |
| | Biotin | AOAC 2016.02 / ISO 23305 | HPLC-UV | II | CCMAS39 REP18/MAS CCMAS41 REP21/MAS |
| | Iron | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Calcium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |

| Commodity | Provision | Method | Principle | Type | Endorsed by CCMAS for Infant formula |
|---|---|---|---|---|---|
| | Phosphorus | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Magnesium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Sodium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Chloride | AOAC 2016.03 / ISO 21422 \| IDF 242 | Potentiometry | II | CCMAS39 REP18/MAS |
| | Potassium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Manganese | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Iodine | AOAC 2012.15 / ISO 20647 \| IDF 234 | ICP-MS | II | CCMAS37 REP16/MAS |
| | Selenium | AOAC 2011.19 / ISO 20649 \| IDF 235 | ICP-MS | II | CCMAS38 REP17/MAS |
| | Copper | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Zinc | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II | CCMAS40 REP19/MAS |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III | CCMAS41 REP21/MAS |
| | Total nucleotides | AOAC 2011.20 / ISO 20638 | LC | II | CCMAS37 REP16/MAS |
| | Choline | AOAC 2015.10 / ISO 21468 | UHPLC-MS/MS | II | CCMAS41 REP21/MAS |
| | Myo-inositol | AOAC 2011.18 / ISO 20637 | LC-pulsed amperometry | II | CCMAS37 REP16/MAS |
| | L-carnitine | AOAC 2015.10 / ISO 21468 | UHPLC-MS/MS | II | CCMAS41 REP21/MAS |

| Commodity | Provision | Method | Principle | Type | Endorsed by CCMAS for Infant formula |
|---|---|---|---|---|---|
| | Total amino acids (excluding taurine and tryptophan) for use according to section 3.1.3 (a) notes 2) and 3) of CXS 156-1987 | AOAC 2018.06 / ISO 4214 \| IDF 254 /AACC 07-50.01 | UHPLC-UV | II | CCMAS42 REP23/MAS |
| | Tryptophan | AOAC 2017.03 | HPLC | II | CCMAS42 REP23/MAS |
| | Total fatty acids | AOAC 2012.13 / ISO 16958 \| IDF 231 | Gas chromatography | II | CCMAS38 REP17/MAS |
| | Crude protein | ISO 8968-1 \| IDF 20-1 | Titrimetry (Kjeldahl) | I | CCMAS36 REP15/MAS |
| Infant formula | Folic acid# | AOAC 2011.06#/ISO 20631 | LC-MS/MS | II | CCMAS40 REP19/MAS |

# AOAC 2011.06 already endorsed in the past, while identical ISO 20631 needs to be endorsed by CCMAS44.

3. CCNFSDU44 agreed to request CCMAS to:

- consider revoking/retyping of methods for follow-up formula currently listed in CXS 234-1999 as follows and listed in Table 2:
    - retype/revoke AOAC 974.29, AOAC 992.04, AOAC 992.06 for vitamin A;
    - retype AOAC 992.07 for pantothenic acid; and
    - retype/revoke AOAC 992.24 for iodine.

Table 2: Methods currently listed in CXS-234-1999 for review, (re)typing, revocation for the determination of nutrients in follow-up formula (CXS 156-1987, Section A)

| Commodity | Provision | Method | Principle | Type | Note |
|---|---|---|---|---|---|
| Follow-up formula | Vitamin A | AOAC 992.04 | HPLC | II | Retype or Revoke |
| | | AOAC 992.06 | HPLC | III | Retype or Revoke |
| | | AOAC 974.29 | Colorimetry | IV | Retype or Revoke |
| | Pantothenic acid | AOAC 992.07 | Microbioassay | ~~II~~ III | Retype |
| | Iodine | AOAC 992.24 | Ion-selective potentiometry | II | Retype or Revoke |

AOAC, ISO and IDF proposes the following actions for CCMAS' consideration:

- Revoke AOAC 992.24 for iodine:

  CCMAS37 indicated that AOAC 992.24 is not fit for purpose to verify compliance with the provision on iodine for infant formula according to CXS 72-1981. AOAC 992.24 is quantifying the amount of iodide and not total iodine as assayed with the proposed method AOAC 2012.15 / ISO 20647 \| IDF 234. According to CXS 156-1987 the provision for iodine needs to be verified.

- Revoke AOAC 974.29, AOAC 992.04, AOAC 992.06 for vitamin A:

CAC39 in 2016 adopted AOAC 2012.10 / ISO 20633 as Type II for provisions on infant formula in CXS 72-1981 (Section A), as proposed by CCNFSDU37 and endorsed by CCMAS37. AOAC 992.04 and AOAC 992.06 (endorsed as Type II and Type III respectively for provisions in CXS 72-1981 at CCMAS30 in 2009) were revoked from CXS 234-1999 for infant formula. Together with AOAC 974.29, these methods are no longer in CXS 234-1999 for infant formula and consequently should be revoked for provisions on follow-up formula. It should be noted that as compared to AOAC 974.29, AOAC 992.04, and AOAC 992.06, AOAC 2012.10 / ISO 20633 has been collaboratively studied using infant formula matrices representative of the wide range and diversity of current formulations for these product categories.

- Retype AOAC 992.07 for pantothenic acid:

  CAC39 adopted AOAC 2012.16 / ISO 20639 as Type II method, as proposed by CCNFSDU and endorsed by CCMAS for verification of the provision on pantothenic acid in infant formula in CXS 72-1981.

  In 2019, CCNFSDU41 agreed to retain microbiological methods for the determination of vitamins as they are still in use. It is therefore proposed to retype AOAC 992.07 as a Type III method for pantothenic acid in follow-up formula. It should be noted that results generated by AOAC 992.07 are not different from results generated by AOAC 2012.16 / ISO 20639, as confirmed by Andrieux et al., JAOAC 95, 2, 2012:143.

In summary, regarding the methods for Vitamin A, Pantothenic acid and Iodine the following actions are recommended.

Table 3: Proposed actions by CCMAS44 for methods currently listed in CXS 234-1999 for the determination of nutrients in follow-up formula (CXS 156-1987, Section A)

| **Commodity** | **Provision** | **Method** | **Principle** | **Type** | **Proposed actions By CCMAS44** |
|---|---|---|---|---|---|
| Follow-up formula | Vitamin A | AOAC 992.04 | HPLC | II | Revoke |
| | | AOAC 992.06 | HPLC | III | Revoke |
| | | AOAC 974.29 | Colorimetry | IV | Revoke |
| | Pantothenic acid | AOAC 992.07 | Microbioassay | ~~II~~ III | Retype |
| | Iodine | AOAC 992.24 | Ion-selective potentiometry | II | Revoke |

**Recommendations to CCMAS44**

AOAC/ISO/IDF recommends CCMAS44 to take the following actions:

1. Endorse methods as indicated in Table 4.

Table 4: Type II/Type III methods for the determination of nutrients in infant formula (CXS 72-1981, Section A) and follow-up formula (CXS 156-1987, Section A).

| **Commodity** | **Provision** | **Method** | **Principle** | **Type** |
|---|---|---|---|---|
| Follow-up formula | Vitamin A | AOAC 2012.10 / ISO 20633 | HPLC-UV | II |
| | Vitamin E | AOAC 2012.10 / ISO 20633 | HPLC | II |
| | Vitamin D | AOAC 2016.05 / ISO 20636 | LC-MS | II |
| | Thiamine | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II |
| | Riboflavin | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II |
| | Niacin | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II |

| Commodity | Provision | Method | Principle | Type |
|---|---|---|---|---|
| | Vitamin $B_6$ | AOAC 2015.14 / ISO 21470 | Enzymatic digestion and UHPLC-MS/MS | II |
| | Vitamin $B_{12}$ | AOAC 2011.10 / ISO 20634 | HPLC | II |
| | | AOAC 2014.02 | LC-UV | III |
| | Pantothenic acid | AOAC 2012.16 / ISO 20639 | UHPLC-MS/MS | II |
| | Folic Acid | AOAC 2011.06 / ISO 20631 | LC-MS/MS | II |
| | Vitamin C | AOAC 2012.22 / ISO 20635 | HPLC-UV | II |
| | Biotin | AOAC 2016.02 / ISO 23305 | HPLC-UV | II |
| | Iron | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Calcium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Phosphorus | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Magnesium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Sodium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Chloride | AOAC 2016.03 / ISO 21422 \| IDF 242 | Potentiometry | II |
| | Potassium | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Manganese | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Iodine | AOAC 2012.15 / ISO 20647 \| IDF 234 | ICP-MS | II |
| | Selenium | AOAC 2011.19 / ISO 20649 \| IDF 235 | ICP-MS | II |
| | Copper | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |
| | | AOAC 2011.14 / ISO 15151 \| IDF 229 | ICP emission spectroscopy | III |
| | Zinc | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP-MS | II |

| Commodity | Provision | Method | Principle | Type |
|---|---|---|---|---|
| | | AOAC 2011.14 / ISO 15151\|IDF 229 | ICP emission spectroscopy | III |
| | Total nucleotides | AOAC 2011.20 / ISO 20638 | LC | II |
| | Choline | AOAC 2015.10 / ISO 21468 | UHPLC-MS/MS | II |
| | Myo-inositol | AOAC 2011.18 / ISO 20637 | LC-pulsed amperometry | II |
| | L-carnitine | AOAC 2015.10 / ISO 21468 | UHPLC-MS/MS | II |
| | Total amino acids (excluding taurine and tryptophan) for use according to section 3.1.3 (a) notes 2) and 3) of CXS 156-1987 | AOAC 2018.06 / ISO 4214\|IDF 254 /AACC 07-50.01 | UHPLC-UV | II |
| | Tryptophan | AOAC 2017.03 | HPLC | II |
| | Total fatty acids | AOAC 2012.13 / ISO 16958 \|IDF 231 | Gas chromatography | II |
| | Crude protein | ISO 8968 \|IDF 20-1 | Titrimetry | I |
| Infant formula | Folic acid | AOAC 2011.06/ISO 20631 | LC-MS/MS | II |

2. Revoke/Retype methods as indicated in Table 5.

Table 5: Methods currently listed in CXS-234-1999 for provisions in follow-up formula.

| Commodity | Provision | Method | Principle | Type | Note |
|---|---|---|---|---|---|
| Follow-up formula | Vitamin A | AOAC 992.04 | HPLC | II | Revoke |
| | | AOAC 992.06 | HPLC | III | Revoke |
| | | AOAC 974.29 | Colorimetry | IV | Revoke |
| | Pantothenic acid | AOAC 992.07 | Microbioassay | ~~II~~ III | Retype |
| | Iodine | AOAC 992.24 | Ion-selective potentiometry | II | Revoke |

**Information submitted on butter and cheese**

**Executive Summary**

This document provides information as per the template agreed on at CCMAS 2019 for the submission of new methods in the framework of the CCMAS eWG on endorsement.

AOAC, IDF and ISO recommend the WG on Endorsement and CCMAS to take the following actions:

1. Endorse AOAC 2016.03 / ISO 21422 | IDF 242 as Type II for the determination of sodium chloride in butter and cheese, due to better reproducibility,
2. Change ISO 15648 | IDF 179 to Type III for the determination of sodium chloride in butter,
3. Change ISO 5943 | IDF 88 as Type III for the determination of sodium chloride in cheese.
4. ISO 1738 | IDF 12/ AOAC 960.29 would remain as Type III for the determination of sodium chloride in butter.

**CCMAS Submission of revised methods for the determination of chloride expressed as sodium chloride for butter and cheese**

- AOAC, IDF and ISO published in 2018 the method AOAC 2016.03/ISO 21422|IDF 242 for determination of chloride in infant formula, adult nutritional products, milk, milk powder, whey powder, butter and cheese. This method is already included in CX 234 for determination of chloride in infant formula.
- Report is published in Journal of AOAC: Journal of AOAC INTERNATIONAL, Volume 102, Issue 2, 1 March 2019, Pages 564–569, https://doi.org/10.5740/jaoacint.18-0244
- Description of the principle:

  Chloride is extracted from samples by mixing in warm water, or directly from ready-to-feed (RTF) products. After (optional) precipitation of proteins, chloride ions are titrated with standardized AgNO3 solution potentiometrically, using a silver electrode to detect the end point.

| | AOAC 2016.03 / ISO 21422 \| IDF 242 | ISO 15648 \| IDF 179 | ISO 1738 \| IDF 12/ AOAC 960.29 | ISO 5943 \| IDF 88 |
|---|---|---|---|---|
| Matrices, samples used in collaborative study | 25 matrices, including butter and cheese | Butter | Butter | Cheese and processed cheese products |
| Concentration range of dairy matrices validated | 0,35 mg chloride/100 g to 711,6 mg chloride/100 g product | 1.051 – 2.027 g/100g | 1.262 – 2.931 g/100g | 0.99 -1.88 g/100 g |
| Repeatability ‘r’ in g/100g product Butter | 0.01767 | 0.05 | 0.03 | / |
| Repeatability ‘r’ in g/100g product Cheese | 0.02366 | / | / | 0.02 |
| Reproducibility ‘R’ in g/100g products Butter | 0.03648 | 0.08 | 0.05 | / |
| Reproducibility ‘R’ in g/100g products Cheese | 0.04407 | / | / | 0.06 |

| | AOAC 2016.03 / ISO 21422 \| IDF 242 | ISO 15648 \| IDF 179 | ISO 1738 \| IDF 12/ AOAC 960.29 | ISO 5943 \| IDF 88 |
|---|---|---|---|---|
| Recovery range from SLV/MLT | N/A | N/A | N/A | N/A |
| Accuracy (Certified materials): NIST SRM 1849a:Infant/adult nutritional Formula (milk-based | N/A | | N/A | N/A |
| Limit of Quantitation | N/A | N/A | N/A | N/A |
| CXS 279 butter | Listed as permitted ingredient | | | |
| CXS 280 cheese | Listed as permitted ingredient | | | |

[Note: SLV refers to Single Laboratory Validation. MLT refers to Multi-Laboratory Testing studies (i.e., collaborative studies).]

**Proposed changes in CXS 234**

| **Commodity** | **Provision** | **Method** | **Principle** | **Codex STAN** | **Proposed Type** |
|---|---|---|---|---|---|
| **Butter** | **Salt** | **AOAC 2016.03 / ISO 21422 \| IDF 242** | **Potentiometry (Determination of chloride, expressed as sodium chloride)** | **279** | **II** |
| Butter | Salt | ISO 15648 \| IDF 179 | Potentiometry (Determination of chloride, expressed as sodium chloride) | **279** | ~~II~~ **III** |
| Butter | Salt | ISO 1738 \| IDF 12/ AOAC 960.29 | Titrimetry (Mohr: determination of chloride, expressed as sodium chloride) | **279** | III (no change) |
| **Cheese** | **Sodium Chloride** | **AOAC 2016.03 / ISO 21422 \| IDF 242** | **Potentiometry (Determination of chloride, expressed as sodium chloride)** | **283** | **II** |
| Cheese | Sodium chloride | ISO 5943 \| IDF 88 | Potentiometry (determination of chloride, expressed as sodium chloride) | **283** | I**I** |

**Information submitted on milk fat products**

- **Numeric performance criteria for methods of analysis for copper and iron in milk fat products and edible casein products**

IDF, ISO and AOAC International wish to remind CCMAS that a number of methods had been listed as examples for the criteria approach for copper and iron in milkfat products and in edible casein products. Not all methods currently listed in CXS 234 meet the criteria and CCMAS had an outstanding task to come back to review these methods.

- In order to address this at CCMAS44, the following changes are proposed in Table 5 of CXS 234 (page 54).

**Table 5 - Numeric performance criteria for methods of analysis for copper and iron in milk fat products**

| Commodity | Provision | ML (mg/kg) | LOD (mg/kg) | LOQ (mg/kg) | RSDR (%) | Recovery | Minimum Applicable Range | | Examples of applicable methods that meet the criteria | Principle |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Minimum | Maximum | | |
| Milk fat products | Copper | 0.05 | 0.010 | 0.020 | 44.0 | 60-115% | 0.028 | 0.072 | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP mass spectrometry |
| | | | | | | | | | ~~ISO 5738\|IDF 76~~ | ~~Photometry, (diethyldithiocarbamate)~~ |
| | | | | | | | | | ~~AOAC 960.40~~ | ~~Photometry, (diethyldithiocarbamate)~~ |
| Milk fat products | Iron | 0.2 | 0.020 | 0.040 | 40.8 | 80-110% | 0.08 | 0.32 | AOAC 2015.06 / ISO 21424 \| IDF 243 | ICP mass spectrometry |