

CODEX ALIMENTARIUS COMMISSION



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Agenda Item 4

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING
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REVIEW AND UPDATE OF METHODS IN CXS 234
Recommended methods of analysis for milk and milk products
(Prepared by AOAC/IDF/ISO)

INTRODUCTION

At its 38th session, CCMAS agreed to continue efforts on the workable packages for the review and update of CODEX STAN 234-1999 (CXS 234-1999) as described in CX/MAS 17/38/6. The Committee also agreed to pilot this effort through an update of all methods related to milk and milk products with the assistance of IDF, ISO and AOAC (REP 17/MAS, §58-59).

AOAC, IDF and ISO welcome the opportunity to present to CCMAS their review of the “dairy products package”. AOAC/IDF/ISO have reviewed all methods relating to milk and milk products, and have identified some issues that require attention by the Committee (see Recommendations and Table below).

For commodities/provisions in the Table with no comments, AOAC/IDF/ISO confirm that the current information is correct.

RECOMMENDATIONS

In the preamble of CXS 234 or other suitable place, CCMAS to

- Clarify rules for determining when a defining method should be Type I or Type IV method. For example:
 - Is it necessary to have precision figures for a Type I method?
 - If a defining method has been subjected to an international collaborative study involving dairy commodities A, B and C, and the method is generally known to work on commodity D, but this commodity was not included in the study, should the method then be listed as Type I or Type IV in CXS 234 for commodity D?
- Clarify for the situation where there are two defining methods (from different organisations) and the degree of validation differs (i.e. one method has been subjected to an international collaborative study, whereas the other method has not), whether one method be Type I and the other method Type IV, or only one (the best validated) method should be accepted and be listed as Type I.
- Clarify for those cases where a provision is not specifically listed in the Commodity Standard, what decision process is to be followed to determine whether or not to include such provision in CXS 234 (e.g., see provisions for iron in milk products, lead in edible casein products, and MSNF in cream in the table below).
- Apply a consistent approach in listing provisions that require a calculation based on two or more analyses. In some cases, all concerned methods are listed; in other cases only a single method (see example of inconsistency below).

Cottage cheese	Fat-free dry matter	ISO 5534 IDF 4 and ISO 1735 IDF 5	Calculation from dry matter content and fat content Gravimetry, drying at 102 °C Gravimetry (Schmid-Bondzynski- Ratzlaff)	I
Cheeses in brine	Milk fat in dry matter (FDM)	ISO 1735 IDF 5	Gravimetry (Schmid-Bondzynski- Ratzlaff)	I

Milk and Milk Products

Milk products	Iron	NMKL139AOAC999.11 (Codex general method)	Atomic absorption spectrophotometry	II
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Comment:

There is no standard for milk products and no provision for iron in nutrition labelling nor GSTCFF. There are provisions for iron in butter, milk fat products, whey powders and edible casein products. AOAC 999.11 as written has only been validated in milk powder, does not contain precision data or specify applicability to milk products.

A separator is needed between NMKL 139 AOAC 999.1, forward slash or vertical line as appropriate.

Milk products	Iron	NMKL161/ AOAC999.10	Atomic absorption spectrophotometry	III
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Comment:

There is no standard for milk products and no provision for iron in nutrition labelling nor GSTCFF. There are provisions for iron in butter, milk fat products, whey powders and edible casein products. AOAC 999.10 as written is not applicable to foods $\geq 40\%$ fat, specifically states not applicable to milk powder, does not contain precision data or specify applicability to milk products.

Milk products	Iron	AOAC984.27	Inductively Coupled Plasma optical emission spectrophotometry	III
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Comment:

There is no standard for milk products and no provision for iron in nutrition labelling nor GSTCFF. There are provisions for iron in butter, milk fat products, whey powders and edible casein products. AOAC 984.27 as written has only been validated in infant formula and does not include precision data or specify applicability to milk products.

Milk products	Iron	ISO6732 IDF103	Photometry (bathophenanthroline)	IV
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Comment:

There is no standard for milk products and no provision for iron in nutrition labelling nor GSTCFF. There are provisions for iron in butter, milk fat products, whey powders and edible casein products.

Milk and Milk Products	Melamine	ISO/TS15495 IDF/RM230	LC-MS/MS	IV
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Comment:

There is no standard for milk products.

Milk and Milk Products

Milk products (products not completely soluble in ammonia)	Milk fat	ISO8262-3 IDF124-3	Gravimetry (Weibull-Berntrop)	I
Comment: There is no standard for milk products.				
Blend of evaporated skimmed milk and vegetable fat	Total fat	ISO1737 IDF13	Gravimetry (Röse-Gottlieb)	I
Blend of evaporated skimmed milk and vegetable fat	Milk solids-not-fat ¹⁵ (MSNF)	ISO6731 IDF21andISO1737 IDF13	Calculation from total solids content and fat content Gravimetry (Röse-Gottlieb)	I
Blend of evaporated skimmed milk and vegetable fat	Milk protein in MSNF ¹⁵	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	IV
Blend of evaporated skimmed milk and vegetable fat	Milk protein in MSNF ¹⁵	AOAC991.20	Titrimetry (Kjeldahl)	IV
Reduced fat blend of evaporated skimmed milk and vegetable fat	Total fat	ISO1737 IDF13	Gravimetry (Röse-Gottlieb)	I
Reduced fat blend of evaporated skimmed milk and vegetable fat	Milk solids-not-fat ¹⁵ (MSNF)	ISO6731 IDF21 andISO1737 IDF13	Calculation from total solids content and fat content Gravimetry (Röse-Gottlieb)	I
Comment: Note 15 is needed				
Reduced fat blend of evaporated skimmed milk and vegetable fat	Milk protein in MSNF ¹⁵	ISO8968-1 IDF20-1 f	Titrimetry (Kjeldahl)	IV
Reduced fat blend of evaporated skimmed milk and vegetable fat	Milk protein in MSNF ¹⁵	AOAC991.20	Titrimetry (Kjeldahl)	IV
Blend of skimmed milk and vegetable fat in powdered form	Total fat	ISO1736 IDF9	Gravimetry (Röse-Gottlieb)	I
Blend of skimmed milk and vegetable fat in powdered form	Water ¹⁶	ISO5537 IDF26	Gravimetry, drying at 87°C	I
Blend of skimmed milk and vegetable fat in powdered form	Milk protein in MSNF ¹⁵	ISO8968-1 IDF20-1 f	Titrimetry (Kjeldahl)	IV
Blend of skimmed milk and vegetable fat in powdered form	Milk protein in MSNF ¹⁵	<u>AOAC991.20</u>	<u>Titrimetry (Kjeldahl)</u>	<u>IV</u>

¹⁵ Milk total solids and Milk solids-not-fat (MSNF) content include water of crystallization of lactose

¹⁶ Water content excluding the crystallized water bound to lactose (generally known as "moisture content")

Milk and Milk Products**Comment: The content of the line was missing**

Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	Total fat	ISO1736 IDF9	Gravimetry (Röse-Gottlieb)	I
Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	Water ¹⁶	ISO5537 IDF26	Gravimetry, drying at87°C	I
Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	Milk protein in MSNF ¹⁵	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	IV
Reduced fat blend of skimmed milk powder and vegetable fat in powdered form	Milk protein in MSNF ¹⁵	AOAC991.20	Titrimetry (Kjeldahl)	IV
Blend of sweetened condensed skimmed milk and vegetable fat	Total fat	ISO1737 IDF13	Gravimetry (Röse-Gottlieb)	I
Blend of sweetened condensed skimmed milk and vegetable fat	Sucrose	ISO2911 IDF35	Polarimetry	IV
Blend of sweetened condensed skimmed milk and vegetable fat	Milksolids-not-fat ¹⁵ (MSNF)	ISO6734 IDF15	Calculation from total solids content, fat content and sugar content	IV
Comment: note 15 needed.				
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	Milk protein in MSNF ¹⁵	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	IV
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	Milk protein in MSNF ¹⁵	AOAC991.20	Titrimetry (Kjeldahl)	IV
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	Total fat	ISO1737 IDF13	Gravimetry (Röse-Gottlieb)	I
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat t	Milksolids-not-fat ¹⁵ (MSNF)	ISO6734 IDF15	Calculation from total solids content and sugar content	IV

Milk and Milk Products**Comment: note 15 needed.**

Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	MilkproteininMSNF ¹⁵	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	IV
Reduced fat blend of sweetened condensed skimmed milk and vegetable fat	MilkproteininMSNF ¹⁵	AOAC991.20	Titrimetry (Kjeldahl)	IV
Butter	Copper	ISO5738 IDF76 AOAC960.40	Photometry, diethyldithiocarbamate	II

Comment: The IDF/ISO method and AOAC method are different and should be written in different lines. AOAC 960.40 as written does not contain precision data or specify applicability to butter.

Butter	Lead	AOAC972.25(Codex general method)	Atomic absorption spectrophotometry	II
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Comment: AOAC 972.25 as written does not contain precision data or specify applicability to butter.

Butter	Milksolids-not-fat ¹⁵ (MSNF)	ISO3727-2 IDF80-2	Gravimetry	I
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Comment: note 15 needed.

Butter	Milkfat	ISO17189 IDF194	Gravimetry Direct determination of fat using solvent extraction	I
Butter	Milkfat purity	ISO17678 IDF202	Calculation from determination of triglycerides by gas chromatography	I
Butter	Salt	ISO1738 IDF12/AOAC960.29	Titrimetry(Mohr:determinationofchloride,expressedassodiumchloride)	III
Butter	Salt	ISO15648 IDF179	Potentiometry (determination of chloride, expressed as sodium chloride)	II
Butter	Vegetable fat (sterols)	ISO12078 IDF159	Gaschromatography	II
Butter	Vegetable fat (sterols)	ISO18252 IDF200	Gaschromatography	III
Butter	Water ¹⁶	ISO3727-1 IDF80- <u>1</u>	Gravimetry	I

Milk and Milk Products**Comment: Correct references are ISO 3727-1|IDF 80-1**

Cheese	Citric acid	ISO/TS2963 IDF/RM34	Enzymatic method	IV
Cheese	Citric acid	AOAC976.15	Photometry	II

Comment: AOAC 976.15 as written does not include precision data.

Cheese	Milkfat	ISO1735 IDF5	Gravimetry (Schmid-Bondzynski-Ratzlaff)	I
Cheese	Moisture	ISO5534 IDF4	Gravimetry, drying at 102°C	I
Cheese (and cheese rind)	Natamycin	ISO9233-1 IDF140-1	Molecular absorption spectrophotometry	III
		ISO9233-2 IDF140-2	HPLC	II

Comment: Shall the two lines above be fully separated as the two methods have different types?

Cheese	Sodium chloride	ISO5943 IDF88	Potentiometry (determination of chloride, expressed as sodium chloride)	II
Cheeses, individual	Dry matter (Total solids)	ISO5534 IDF4	Gravimetry, drying at 102°C	I
Cheeses, individual	Milkfat in dry matter	ISO1735 IDF5	Gravimetry (Schmid-Bondzynski-Ratzlaff)	I
Cheeses, individual	Dry matter (Total solids) ¹⁵	ISO5534 IDF4	Gravimetry, drying at 102°C	I

Comment: The two lines above may need to be combined, as both ISO 1735|IDF5 and ISO 5534|IDF 4 are needed to determine milkfat in dry matter (see fat-free dry matter for cottage cheese for instance). CCMAS to clarify a consistent format when combination of several methods.

Cheeses in brine	Milkfat in dry matter (FDM)	ISO1735 IDF5	Gravimetry (Schmid-Bondzynski-Ratzlaff)	I
Cottage cheese	Fat-free dry matter	ISO5534 IDF4 and ISO1735 IDF5	Calculation from dry matter content and fat content Gravimetry, drying at 102°C Gravimetry (Schmid-Bondzynski-Ratzlaff)	I
Cottage cheese	Milkfat	ISO1735 IDF5	Gravimetry (Schmid-Bondzynski-Ratzlaff) (for samples containing lactose up to 5%)	I

Milk and Milk Products

		ISO8262-3 IDF124-3	Gravimetry (Weibull-Berntrop) (for samples containing lactose over 5%)	
Cottage cheese	Milkfat in dry matter	ISO8262-3 IDF124-3	Gravimetry (Weibull-Berntrop)	

Comment: ISO5534|IDF4 must be added for dry matter determination. Also, ISO 1735 | IDF 5 is preferable to ISO 8262-3 | IDF 124-3. ISO 1735 |IDF 5 is fully applicable to cottage cheese unless the cheese contains non-dairy ingredients like sugar, jam, muesli.... For these “added” products ISO 8262-3 | IDF 124-3 is more appropriate.

Cheese, Unripened Including Fresh Cheese	Milk Protein	ISO8968-1 IDF20-1	Titrimetry, Kjeldahl	
Cream and Prepared Creams	Milk protein	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	
Cream	Milkfat	ISO2450 IDF16	Gravimetry (Röse-Gottlieb)	
Cream	Solids ¹⁵	ISO6731 IDF21	Gravimetry (drying at 102°C)	

Comment: note 15 needed.

Creams Lowered in Milkfat Content	Milkfat	ISO2450 IDF16/AOAC995.19	Gravimetry(Röse-Gottlieb)	
Creams, Whipped Creams and Fermented Creams	Milksolids-not-fat (MSNF) ¹⁵	ISO3727-2 IDF80-2 AOAC920.116	Gravimetry	

Comment: There appears to be no requirement for MSNF in CXS 288 for creams and prepared creams, therefore CCMAS to confirm the need for this provision in CXS 234.

**AOAC 920.116 is not equivalent to the ISO|IDF method, therefore the method should be listed in separate lines
Neither the ISO|IDF method nor the AOAC method have been validated for this commodity.**

Cream cheese	Dry matter	ISO5534 IDF4	Gravimetry drying at102°C (forced air oven)	
Cream cheese	Moisture on fat free basis	ISO5534 IDF4	Calculation from fat content and moisture content Gravimetry drying at102°C(forced air oven)	
Dairy fat spreads	Milkfat purity	ISO1735 IDF5 ISO17678 IDF202	Gravimetry (Schmid-Bondzynski-Ratzlaff) Calculation from determination of triglycerides by gas chromatography	
Dairy fat spreads	Total fat	ISO17189 IDF194	Gravimetry Direct determination of fat using solvent extraction	

Milk and Milk Products

Dairy fat spreads	Vegetable fat (sterols)	ISO12078 IDF159	Gas chromatography	II
Dairy fat spreads	Vegetable fat (sterols)	ISO18252 IDF200	Gas chromatography	III
Edible casein products	Acids, free	ISO5547 IDF91	Titrimetry (aqueous extract)	IV
Edible casein products	Ash(includingP ₂ O ₅)	ISO5545 IDF90 or ¹⁷ ISO5544 IDF89	Gravimetry (ashingat825°C)	I
Edible casein products	Copper	AOAC985.35	Atomic absorption spectrophotometry	II
Edible casein products	Copper	ISO5738 IDF76	Colorimetry(diethyldiethiocarbamate)	III
Edible casein products	Lactose	ISO5548 IDF106	Photometry(phenol and H ₂ SO ₄)	IV
Edible casein products	Lead	NMKL139 (Codex general method) AOAC999.11	Atomic absorption spectrophotometry	II
<i>Comment: There is no provision for lead in CXS 290 for edible casein products. AOAC 999.11 as written has only been validated in milk powder and does not contain precision data or specify applicability to edible casein products.</i>				
Edible casein products	Lead	NMKL161/AOAC999.10	Atomic absorption spectrophotometry	III
<i>Comment: There is no provision for lead in CXS 290 for edible casein products. AOAC 999.10 as written does not contain precision data or specify applicability to edible casein products.</i>				
Edible casein products	Lead	AOAC972.25(Codex general method)	Atomic absorption spectrophotometry	III
<i>Comment: There is no provision for lead in CXS 290 for edible casein products. AOAC 972.25 as written does not contain precision data or specify applicability to edible casein products.</i>				
Edible casein products	Lead	AOAC982.23(Codex general method)	Anodic stripping voltanmetry	III
<i>Comment: There is no provision for lead in CXS 290 for edible casein products. AOAC 982.23 as written does not contain precision data or specify applicability to edible casein products.</i>				

¹⁷ Refer to scope of the methods

Milk and Milk Products				
Edible casein products	Lead	ISO/TS6733 IDF/RM133	Spectrophotometry(1,5-diphenylthiocarbazone)	IV
Comment: There is no provision for lead in CXS 290 for edible casein products.				
Edible casein products	Milkfat	ISO5543 IDF127	Gravimetry (Schmid-Bondzynski-Ratslaff)	I
Edible casein products	pH	ISO5546 IDF115	Electrometry	IV
Edible casein products	Milk Protein(totalNx6.38indrymatter)	ISO8968-1 IDF20-1	Titrimetry, Kjeldahl	I
Edible casein products	Sediment(scorched particles)	ISO5739 IDF107	Visual comparison with standard disks, after filtration	IV
Edible casein products	Water ¹⁶	ISO5550 IDF78	Gravimetry (dryingat102°C)	I
Emmental	Calcium ≥800mg/100g	ISO8070 IDF119	Flame atomic absorption	IV
Evaporated milks	Milkfat	ISO1737 IDF13	Gravimetry (Röse-Gottlieb)	I
Evaporated milks	Milk Protein in MSNF ¹⁵	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	I
Evaporated milks	Solids, total ¹⁵	ISO6731 IDF21	Gravimetry (drying at 102°C)	I
Fermented milks	Colony-forming units of yeasts and/or moulds	ISO6611 IDF94	Colony-count at 25°C	IV
Fermented milks	Dry matter (total solids) ¹⁵	ISO13580 IDF151	Gravimetry (drying at102°C)	I
Comment: note 15 needed.				
Fermented milks	Total acidity expressed as percentage of lactic acid	ISO/TS11869 IDF/RM150	Potentiometry,titrationtopH8.30	I
Fermented milks	<i>Lactobacillus acidophilus</i>	ISO20128 IDF192	Colonycountat37°C	I

Milk and Milk Products

Fermented milks - Yoghurt and yoghurt products	<i>Lactobacillus delbrueckii</i> subsp <i>bulgaricus</i> & <i>Streptococcus</i> <i>thermophilus</i>	ISO7889 IDF117	Colony count at 37°C	I
Fermented milks - Yoghurt and yoghurt products	<i>Lactobacillus delbrueckii</i> subsp <i>bulgaricus</i> & <i>Streptococcus</i> <i>thermophilus</i>	ISO9232 IDF146	Test for strain identification	I
Fermented milks	Microorganisms constituting the starter culture	ISO27205 IDF149 (Annex A)	Colony count at 25°C, 30°C, 37°C and 45°C according to the starter organism in question	IV
Fermented milks	Milkfat	ISO1211 IDF1/AOAC989.05	Gravimetry (Röse-Gottlieb)	I
Comment: The IDF/ISO and AOAC methods are different and neither have been specifically validated for fermented milks.				
Fermented milks	Milk Protein	ISO8968-1 IDF20-1	Titrimetry(Kjeldahl)	I
Milk powders and cream powders	Acidity, titratable	ISO6091 IDF86	Titrimetry,titrationtopH8.4	I
Milk powders and cream powders	Milkfat	ISO1736 IDF9	Gravimetry (Röse-Gottlieb)	I
Milk powders and cream powders	Milk Protein	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	I
Milk powders and cream powders	Scorched particles	ISO5739 IDF107	Visual comparison with standard disks, after filtration	IV
	Solubility Index	ISO8156 IDF129	Centrifugation	I
Milk powders and cream powders	Water ¹⁶	ISO5537 IDF26 18	Gravimetry (drying at 87°C)	I
Milkfat products	Copper	ISO5738 IDF76 AOAC960.40	Photometry, diethyldithiocarbamate	II
Comment: AOAC 960.40 as written does not contain precision data or specify applicability to milk fat products. The IDF/ISO method and AOAC method are different and should be written in different lines.				
Milkfat products	Fatty acids, free (expressed as oleic acid)	ISO1740 IDF6	Titrimetry	I

Milk and Milk Products

Milkfat products	Milkfat purity	ISO17678 IDF202	Calculation from determination of triglycerides by gas chromatography	I
Milkfat products (anhydrous milkfat)	Peroxide value (expressed as meq. of oxygen/kg fat)	ISO3976 IDF74	Photometry	I

Comment: Clarification to match provision in CXS 280 for Milkfat Products.

Milkfat products (anhydrous milkfat)	Peroxide value	AOAC965.33	Titrimetry	I
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Comment: AOAC 965.33 as written does not contain precision data.

Milkfat products	Vegetable fat(sterols)	ISO12078 IDF159	Gas chromatography	II
		ISO18252 IDF200	Gas chromatography	III

Comment: Shall the two lines above be fully separated as the two methods have different types ?

Milk fat products	Water	ISO5536 IDF23	Titrimetry (KarlFischer)	II
Milk fat products (anhydrous milk fat)	Peroxide value	ISO3976 IDF74	Photometry	I
Milk fat products (anhydrous milkfat)	Peroxide value	AOAC965.33	Titrimetry	I

Comment: Duplicates of lines above.

Mozzarella	Milk fat in dry matter with high moisture	ISO1735 IDF5	Gravimetry after solvent extraction	I
Mozzarella	Milk fat in dry matter–with low moisture	ISO1735 IDF5	Gravimetry after solvent extraction	I
Sweetened Condensed Milks	Milkfat	ISO1737 IDF13	Gravimetry (Röse-Gottlieb)	I
Sweetened Condensed Milks	MilkProteininMNSF ¹⁵	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	I
Sweetened Condensed Milks	Solids ¹⁵	ISO6734 IDF15	Gravimetry,dryingat102°C	I

Comment: note 15 needed

Milk and Milk Products

Whey cheeses by coagulation	Milkfat	ISO1735 IDF5	Gravimetry (Schmid-Bondzynski-Ratzlaff)	I
Whey cheeses by coagulation	Milk fat in dry matter	ISO1735 IDF5 andISO5534 IDF4	Calculation from fat content and dry matter content Gravimetry (Schmid-Bondzynski- RatzlaffGravimetry,dryingat102°C	I
Whey cheeses by concentration	Milkfat	ISO1854 IDF59	Gravimetry (Röse-Gottlieb)	I
Whey cheeses by concentration	Milk fa in dry matter	ISO1854 IDF59andISO2920 ID F58	Calculation from fat content and dry matter content Gravimetry (Röse-Gottlieb) Gravimetry, drying at 88°C	I
Whey powders	Ash	ISO5545 IDF90	Gravimetry (ashingat825°C)	IV
Whey powders	Copper	AOAC985.35	Atomic absorption spectrophotometry	II
Whey powders	Copper	ISO5738 IDF76	Photometry(diethyldithiocarbamate)	III
Whey powders	Lactose	ISO5765-1/2 IDF79-1/2	Enzymaticmethod:Part1-GlucosemoietyorPart2- Galactosemoiety	II
Whey powders	Lead	AOAC972.25 (Codex general method)	Atomic absorption spectrophotometry	II
Comment: AOAC 972.25 as written does not contain precision data or specify applicability to whey powders.				
Whey powders	Milkfat	ISO1736 IDF 9	Gravimetry (Röse-Gottlieb)	I
Whey powders	Milk protein(totalNx6.38)	ISO8968-1 IDF20-1	Titrimetry (Kjeldahl)	I
Whey powders	Moisture, "Free"	ISO2920 IDF58	Gravimetry (drying at 88°C ±2°C)	IV
Whey powders	Water ¹⁶	ISO5537 IDF26	Gravimetry (drying at 87°C)	I

Proposed new methods

<u>Cheese</u>	<u>Propionic acid</u>	<u>ISO/TS 19046-1 IDF/RM 233-1</u>	<u>Gas chromatography</u>	<u>IV</u>
<u>Cheese</u>	<u>Propionic acid</u>	<u>ISO/TS 19046-2 IDF/RM 233-2</u>	<u>Ion exchange chromatography</u>	<u>IV</u>

Comment: CXS 283 General Standard for Cheese has a maximum level of 3000 mg/kg for propionic acid.
