

Legislative Proposal Relating to Formula Products and Foods Intended for Infants and Young Children under the Age of 36 Months in Hong Kong

Test Methods

3rd Technical Meeting with Trade
17 July 2013

Test Methods of Nutrients

- Test methods of nutrients are based on the following Standards
 - Recommended Methods of Analysis and Sampling (Codex Stan 234-1999)
 - International Standard Methods (e.g. ISO Methods, AOAC Methods and EN Standard Methods)

Note: IF: Infant formula;
FF: Follow-up formula

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Protein	Crude protein	AOAC 991.20; ISO 8968-1/2 IDF 20-1/2: 2001 (Type I method, Kjeldahl titrimetry) [IF]	
Total carbohydrates	Moisture and ash	Total carbohydrates AOAC 986.25 (Type I method, Determination by difference) [IF] <u>Moisture or total solids</u> AOAC 990.19; AOAC 990.20; IDF 21B:1987 or ISO 6731:1989 (Type I method, Gravimetry) [IF] <u>Ash</u> AOAC 942.05 (Type I method, Gravimetry) [IF]	
Dietary fibre	Total dietary fibre	AOAC 991.43 (Type I, Gravimetry) [FF]	

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Total Fat		AOAC 989.05; ISO 8381 IDF 123:2008 (Type I Method, Gravimetry) [IF] ISO 8262-1 IDF 124-1:2005 (Type I Method Gravimetry) [IF]	
Fatty acids	Linoleic acid, α -linolenic acid	AOAC 996.06 (Gas chromatography) [IF] AOCS Ce 1h-05 (09) (Gas chromatography) [IF]	AOAC 2012.13 (GC)

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Vitamin A	All-trans-retinol and 13-cis-retinol	EN 12823-1:2000 (HPLC) [IF] AOAC 992.04 (HPLC) [FF] AOAC 992.06 (HPLC) [FF] AOAC 974.29 (Colorimetry) [FF]	AOAC 2011.07 (UPLC) AOAC 2011.15 (HPLC) AOAC 2012.09 (HPLC)
Vitamin D	Vitamin D3 (cholecalciferol) and/or D2 (ergocalciferol)	EN 12821:2000 (D2 & D3, HPLC)* [IF] NMKL 167:2000 (D2 & D3, HPLC) [IF] AOAC 992.26 (D2, HPLC) [IF] AOAC 995.05 (D2 & D3, HPLC) [IF]	AOAC 2011.11 (UPLC-MS/MS) AOAC 2011.12 (UPLC-MS/MS) AOAC 2011.13 (LC-MS/MS) EN 12821:2009 (HPLC method for all foodstuffs) AOAC 2012.11 (LC-MS/MS)
Vitamin E	α -tocopherol compounds	EN 12822: 2000 (HPLC) [IF] AOAC 992.03 (HPLC) [IF]	AOAC 2012.09 (HPLC)

Note: *The standard EN 12821:2000 is replaced by EN 12821:2009

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Thiamine	Thiamine	EN 14122:2003 (HPLC) [IF] AOAC 986.27 (Fluorimetry) [IF]	
Riboflavin	Riboflavin	EN 14152:2003 (HPLC) [IF] AOAC 985.31 (Fluorimetry) [IF]	AOAC 960.46 (Microbiological method)**
Niacin	Nicotinic acid and nicotinamide	prEN 15652:2009 (HPLC) [IF] AOAC 985.34 (Microbioassay and turbidimetry) [IF]	AOAC 960.46 (Microbiological Method)**

**AOAC 960.46 describes microbiological test method for B12, folic acid, niacin, pantothenic acid & riboflavin.

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Pantothenic acid	Pantothenic acid	AOAC 992.07 (Microbioassay) [FF]	AOAC 960.46 (Microbiological Method)** AOAC 2012.16 (UPLC-MS/MS)
Vitamin B6	Pyridoxine, pyridoxal and pyridoxamine	AOAC 2004.07; EN 14164:2008 (HPLC) [IF] AOAC 985.32 (Microbioassay) [IF] EN 14166:2009 (Microbioassay) [IF] EN 14663:2005 (HPLC) [IF]	
Vitamin K	Vitamin K1	AOAC 999.15 (HPLC) [FF] EN 14148:2003 (HPLC) [FF]	AOAC 992.27 (HPLC)

**AOAC 960.46 describes microbiological test method for B12, folic acid, niacin, pantothenic acid & riboflavin.

Method reference for nutrients

Nutrients	Definition	Codex Recommended Method	Other Standard Method
Folic acid	Folic acid	AOAC 992.05 (Microbioassay) [IF] EN 14131:2003 (Microbioassay) [IF]	AOAC 2011.05 (Optical biosensor assay) AOAC 2011.06 (UPLC-MS/MS) AOAC 960.46 (Microbiological Method)**
Vitamin C	Ascorbic acid and dehydroascorbic acid	EN 14130:2003 (HPLC) [IF]	AOAC 985.33 (Titrimetric) AOAC 2012.21 (HPLC) AOAC 2012.22 (UPLC)

**AOAC 960.46 describes microbiological test method for B12, folic acid, niacin, pantothenic acid & riboflavin.

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Vitamin B12	Vitamin B12	AOAC 986.23 (Turbidimetric Method) [IF]	AOAC 2011.01 (Surface Plasmon Resonance) AOAC 2011.08 (HPLC) AOAC 2011.09 (HPLC) AOAC 2011.10 (HPLC) AOAC 2011.16 (Surface Plasmon Resonance) AOAC 960.46 (Microbiological Method)**
Biotin	d-biotin	EN 15607:2008 (HPLC) [IF]	EN 15607:2009 (HPLC)

**AOAC 960.46 describes microbiological test method for B12, folic acid, niacin, pantothenic acid & riboflavin.

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Calcium	Calcium	ISO 8070 IDF 119: 2007 (Flame atomic absorption spectrophotometry) [IF] AOAC 985.35 (Flame atomic absorption spectroscopy) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)
Chloride	Chloride	AOAC 986.26 (Potentiometry) [IF]	
Iodine	Iodine	AOAC 992.24 (Ion-selective potentiometry) [IF] [FF]	EN 15111:2007 (ICP-MS) ISO 14378-2009 (HPLC) AOAC 992.22 (HPLC) AOAC 2012.14 (ICP-MS) AOAC 2012.15 (ICP-MS)

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Iron	Iron	AOAC 999.11 NMKL139:1991 (AAS after dry ashing) [IF] AOAC 985.35 (Flame atomic absorption spectrophotometry) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)
Magnesium	Magnesium	ISO 8070 IDF 119: 2007 (Flame atomic absorption Spectrophotometry) [IF] AOAC 985.35 (Flame atomic absorption Spectroscopy) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Phosphorus	Phosphorus	AOAC 986.24 (Spectrophotometry) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)
Sodium and Potassium	Sodium and potassium	ISO 8070 IDF 119:2007 (Flame atomic absorption spectrophotometry) [IF] AOAC 984.27 (ICP emission spectrometry) [IF]	AOAC 2011.14 (ICP-OES)
Zinc	Zinc	AOAC 985.35 (Flame atomic absorption spectroscopy) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Copper	Copper	AOAC 985.35 (Flame atomic absorption Spectroscopy) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)
Manganese	Manganese	AOAC 985.35 (Flame atomic absorption spectrophotometry) [IF] AOAC 984.27 (ICP emission spectroscopy) [IF]	AOAC 2011.14 (ICP-OES)

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Selenium	Selenium	EN 14627:2005 (Hydride generation atomic absorption spectrometry) [IF] AOAC 996.16 or AOAC 996. 17 (Continuous hydride generation Flame atomic absorption spectrometry) [IF] AOAC 2006.03 (ICP emission spectroscopy) [IF]	AOAC 2011.19 (ICP-MS)

Method reference for nutrients

Nutrients	Scope of analysis	Codex Recommended Method	Other Standard Method
Choline	Choline	AOAC 999.14 (Enzymatic Colorimetric Method) [IF]	AOAC 2012.18 (UPLC-MS/MS) AOAC 2012.20 (IC)
Myo-Inositol	Myo-Inositol		AOAC 2011.18 (HPLC) AOAC 2012.12 (IC)
L-Carnitine	L-Carnitine		AOAC 2012.17 (LC-MS/MS)

Thank You
