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Field of Testing :: Chemical Testing

Chemical Testing

Products	Specific Tests	Method Reference
I. Foods		
01.0 Milk and Dairy Products		
01.1 Milk powder and cream powder	Moisture	Gravimetric Method AOAC 927.05/ 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
01.2 Whey and whey products	Ash	Gravimetric Method AOAC 945.46/ 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
01.3 Condensed milk		
01.4 Liquid Milk (evaporated and Cream (UHT/sterilized)	Crude Protein	Modified Kjeldahl Method AOAC 981.10/928.08, 18 th Ed. (PIPAC AP 017)
01.5 Pasteurized milk		
01.6 Pasteurized cream	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 932.06/ 922.06, 18 th Ed. (PIPAC AP 016)
01.7 Yogurt and other fermented milk		
01.8 Milk and buttermilk	Omega-3 (EPA/DHA)	Gas Chromatography AOAC 991.39/922.06, 18 th Ed. (PIPAC 029)
01.9 Cheese and cheese products (Cottage cheese, soft and semi-soft cheese		
01.10 Processed cheese spread		
01.11 All raw milk cheese		

02.0 Fats and oils, and fat emulsions		
02.1 Fats and oils essentially free from water (vegetable oils and fats, lard, tallow, fish oil and other animal fats) 02.2 Fat emulsions mainly of type water-in-oil (butter, margarine)	Moisture	Gravimetric Method AOAC 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetric Method AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 935.58/ 981.10/ 928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 950.54/ 922.06, 18 th Ed. (PIPAC AP 016)
	Moisture Content by Karl Fischer	Karl Fischer "Water Determination" <921>. USP 37-NF 32 (2014) (PIPAC AP 022)
03.0 Edible ices, including sherbet and sorbet		
03.1 Ice cream and sherbet 03.2 Ice cream with added ingredients 03.3 Flavored Ice	Moisture	Gravimetric Method High-sugar samples: AOAC 925.45/ 934.06. Other samples: AOAC 934.01/920.155, 18 th Ed.
	Ash	Gravimetric Method High-sugar samples: AOAC 900.02/940.26. Other samples: AOAC 920.153/923.03, 18 th Ed.
	Crude Protein	Modified Kjeldahl Method AOAC 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 932.06/ 922.06, 18 th Ed. (PIPAC AP 016)
4.0 Confectioneries		

04.1 Cocoa powder 04.2 Chocolate products; chocolate confectioneries 04.3 Sugar confectioneries (hard and soft candy, nougats, etc.) 04.5 Decorations a, toppings (non-fruit), and sweet sauces	Moisture	Vacuum Drying Gravimetric Method AOAC 925.49/ 925.45/ 934.06, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetric Method AOAC 925.49/ 900.02/ 940.26, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 920.176/ 981.10/ 928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016)
05.0 Fruits and vegetables, seaweeds, nuts and seeds		
05.1 Frozen vegetables and fruits 05.2 Fermented fruits and vegetables 05.3 Fruits and vegetable products in hermetically sealed container 05.4 Dried fruits and vegetables, seaweeds, nuts and seeds 05.5 Coconut (desiccated) 05.6 Nut and seed purees and spreads (e.g., peanut butter) 05.7 Jams, jellies, marmalades and fruit fillings for pastries 05.8 Fruit preparations (pulp, purees, fruit toppings and coconut milk)	Moisture	Gravimetry High-sugar samples: AOAC 934.06/925.45. Other samples: AOAC 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetry High-sugar samples: AOAC 940.26/900.02. Other samples: AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 920.152/ 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis (if needed) / Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016)

	Betacarotene	High-Performance Liquid Chromatography EN 12823-2 ICS 67.040 (2000) (PIPAC AP 018)
06.0 Egg and egg products		
06.1 Egg products 06.1.1 Liquid egg products 06.1.2 Frozen egg products 06.1.3 Dried and/or heat coagulated egg product 06.2 Preserved eggs, including alkaline, salted, and canned eggs 06.3 Egg-based desserts (e.g. custard)	Moisture	Gravimetry High-sugar samples: AOAC 934.06/925.45. Other samples: AOAC 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetry High-sugar samples: AOAC 940.26/900.02. Other samples: AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 935.58/ 981.10/ 928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 925.32/ 922.06, 18 th Ed. (PIPAC AP 016)
	Omega-3 (EPA/DHA)	Gas Chromatography AOAC 991.39/922.06, 18 th Ed. (PIPAC 029)
07.0 Cereals and cereal products		
07.1 Breakfast cereals 07.2 Cereal/cereal grains 07.3 Cultured seeds and grains	Moisture	Gravimetric Method AOAC 926.07/ 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetric Method AOAC 925.11/923.03, 18 th Ed. (PIPAC AP 015)

07.4 Soya flours concentrates and isolates 07.5 Flour, corn meal, corn grits, semolina 07.6 Frozen entrees containing rice or corn flour 07.7 Soy protein 07.8 Tofu 07.9 Pasta products and noodles (e.g. rice paper, rice vermicelli, soybean pastas and noodles) 07.10 Starch 07.11 Cereal and starch- based desserts (e.g., rice pudding, tapioca pudding) 07.12 Batters (e.g., for breading or batters for fish or poultry)	Crude Protein	Modified Kjeldahl Method AOAC 979.09/ 920.87/ 930.25/ 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 922.06/ 925.12, 18 th Ed. (PIPAC AP 016)
	Betacarotene	High-Performance Liquid Chromatography EN 12823-2 ICS 67.040 (2000) (PIPAC AP 018)
	Dietary Fiber	Enzymatic-Gravimetric Method AOAC 992.16/985.29, 18 th Ed. (PIPAC AP 041)
	Minerals (Ca, Mg, Fe, Na, K, Zn)	Inductively Coupled Plasma Spectrometry AOAC 984.27, 18 th Ed. (PIPAC AP 055)
08.0 Bakery Products		
08.1 Frozen bakery products (ready to eat and to be cooked) 08.2 Frozen and refrigerated dough 08.3 Breads and rolls 08.4 Crackers, excluding sweet crackers 08.5 Cakes, cookies and pies, doughnuts 08.6 Other ordinary bakery products (e.g., bagels, pita, English muffins) 08.7 Steamed breads and buns	Moisture	Gravimetric Method AOAC 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetric Method AOAC 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 935.39/ 920.87/ 981.10/ 928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 950.36/ 922.06, 18 th Ed. (PIPAC AP 016)

09.0 Ready-to-eat savouries

09.1 Snacks foods - potato, cereal, flour or starch based	Moisture	Gravimetry High-sugar samples: AOAC 934.06/925.45. Other samples: AOAC 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetry High-sugar samples: AOAC 940.26/900.02. Other samples: AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016)
	Ash	Gravimetric Method AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Soxhlet Method ISO 1443: 1973-04-15 (Codex STAN method) (PIPAC 016)
	Omega-3 (EPA/DHA)	Gas Chromatography AOAC 991.39/922.06, 18 th Ed. (PIPAC 029)
11.0 Fish and fish products		
	Moisture	Gravimetric Method AOAC 920.155/ 934.01 18 th Ed. (PIPAC AP 015)

11.1 Processed fish and fish products, including molluscs, crustaceans, and echinoderms 11.2 Semi-preserved fish and fish products, including molluscs, crustaceans, and echinoderms 11.3 Fully preserved, including canned or fermented fish and fish products, including molluscs, crustaceans, and echinoderms	Ash	Gravimetric Method AOAC 938.08/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 940.25/ 955.04/ 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 948.15/ 922.06, 18 th Ed. (PIPAC AP 016)
	Omega-3 (EPA/DHA)	Gas Chromatography AOAC 991.39/922.06, 18 th Ed. (PIPAC 029)
	Histamine	Fluorometry <i>Journal of Food Science</i> 41, 1282 (1976) (PIPAC AP 002)
	Mercury	Cold-Vapor Atomic Absorption Spectrophotometry AOAC 977.15, 18 th ed. (PIPAC AP 005)
	Heavy Metals (Pb, Cd, Cr, Mn, Mg, Zn, Fe, Cu, Ni)	Inductively Coupled Plasma Spectrometry AOAC 972.23 18 th ed./ EN 14082:2003 PIPAC AP 006)
12.0 Salts, spices, soups, sauces, salads and protein products		
12.1 Salt and salt substitutes 12.2 Herbs, spices, seasonings, and condiments (e.g., seasoning for instant noodles) 12.3 Vinegars 12.4 Mustards 12.5 Soups and broths 12.6 Sauces and like products 12.6.1 Emulsified sauces and dips (e.g.,	Moisture	Gravimetry High-sugar samples: AOAC 934.06/925.45. Other samples: AOAC 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetry High-sugar samples: AOAC 940.26/900.02. Other samples: AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)

<p>mayonnaise, salad dressing, onion dips)</p> <p>12.6.2 non-emulsified sauces (e.g., ketchup, cheese sauce, cream sauce, brown gravy)</p> <p>12.6.3 Mixes for sauces and gravies</p> <p>12.6.4 Clear sauces (e.g., fish sauce)</p> <p>12.7 Salads (e.g., macaroni salad, potato salad) and sandwich spreads excluding cocoa-and nut-based preads of food categories</p> <p>12.8 Yeast and like products</p> <p>12.9 Soybean-based seasonings and condiments</p> <p>12.9.1 Fermented soybean paste (e.g., miso)</p> <p>12.9.2 Soybean sauce</p> <p>12.9.2.1 Fermented soybean sauce</p> <p>12.9.2.2 non-fermented soybean sauce</p> <p>12.9.2.3 Other soybean sauces</p> <p>12.10 Protein products other than from soybeans</p>	Crude Protein	Modified Kjeldahl Method High-fat samples: AOAC 935.58/981.10/928.08. Other samples: AOAC 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Acid Hydrolysis (if needed) / Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016)
	Betacarotene	High-Performance Liquid Chromatography EN 12823-2 ICS 67.040 (2000) (PIPAC AP 018)
<p>12.9 Soybean-based seasonings and condiments</p> <p>12.9.2 Soybean sauce</p>	3-MCPD (3-Monochloropropane-2-diol)	Gas Chromatography-Mass Spectrometric Detection AOAC 2000.01, 18 th Ed/ CEN/TC 275 N 396 add (2000) (PIPAC AP 024)

12.9.2.1 Fermented soybean sauce		
13.0 Beverages		
13.1 Non-alcoholic beverages (Canned /Bottled Fruit and vegetable juices/nectars, Energy drinks and particulated drinks, Carbonated and Non-carbonated water- based flavoured drinks and concentrates (liquid or solid) for water-based flavoured drinks) 13.2 Frozen juice concentrate 13.3 Powdered beverages 13.4 Coffee, coffee substitutes, tea, herbal infusions, and other hot cereal and grain beverages 13.5 Alcoholic beverages (Beer and malt beverages, cider and perry, grape wines and wines, mead, distilled spirits containing more than 15% alcohol and aromatized alcoholic beverages)	Moisture	Gravimetry High-sugar samples: AOAC 934.06/925.45. Other samples: AOAC 935.29/ 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetry High-sugar samples: AOAC 950.14/ 940.26/ 920.54/ 900.02. Other samples: AOAC 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 920.53/ 981.10/928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016).
	Glutathione	High-Performance Liquid Chromatography Official Monographs: Glutathione. USP 37-NF 32 (2014) (PIPAC AP 019)

Carbonated and Non-carbonated water-based flavoured drinks and concentrates (liquid or solid) for water-based flavoured drinks) 13.2 Frozen juice concentrate	Dietary Fiber	Enzymatic-Gravimetric Method AOAC 992.16/985.29, 18 th Ed. (PIPAC AP 041)
13.5 Alcoholic beverages (Beer and malt beverages, cider and perry, grape wines and wines, mead, distilled spirits containing more than 15% alcohol and aromatized alcoholic beverages)	Moisture Content by Karl Fischer	Karl Fischer USP <921>. USP 37-NF 32 (2014) (PIPAC AP 022)
14.0 Foodstuffs intended for particular nutritional uses		
14.1 Infant formulae, follow-on formulae, and formulae for special medical purposes for infants	Moisture	Gravimetric Method AOAC 927.05/ 934.01/ 920.155, 18 th Ed. (PIPAC AP 015)
14.2 Complementary foods for infants and young children	Ash	Gravimetric Method AOAC 945.46/ 920.153/ 923.03, 18 th Ed. (PIPAC AP 015)
14.3 Dietetic foods intended for special medical purposes (excluding products of food category 14.1)		
14.4 Dietetic formulae for slimming purposes and weight reduction	Crude Protein	Modified Kjeldahl Method AOAC 981.10/928.08, 18 th Ed. (PIPAC AP 017)
14.5 Dietetic foods (e.g. supplementary foods for dietary use) excluding products of food categories 14.1- 14.4 and 14.6	Total Fat	Acid Hydrolysis/ Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016).
14.6 Food supplements		

14.6 Food supplements	Betacarotene	High-Performance Liquid Chromatography EN 12823-2 ICS 67.040 (2000) (PIPAC AP 018)
	Glutathione	High-Performance Liquid Chromatography Official Monographs: Glutathione. USP 37-NF 32 (2014) (PIPAC AP 019)
	Omega-3 (EPA/DHA)	Gas Chromatography AOAC 991.39/922.06, 18 th Ed. (PIPAC 029)
	Dietary Fiber	Enzymatic-Gravimetric Method AOAC 992.16/985.29, 18 th Ed. (PIPAC AP 041)
	Minerals (Ca, Mg, Fe, Na, K, Zn)	Inductively Coupled Plasma Spectrometry AOAC 984.27, 18 th Ed. (PIPAC AP 055)
15.0 Sweeteners, including honey		
15.1 Refined and raw sugars 15.2 Brown sugar 15.3 Honey 15.4 Other sugars and syrups (e.g. xylose, maple syrup, sugar toppings) 15.5 Table-top sweeteners, including those containing high-intensity sweeteners	Moisture	Vacuum Drying Gravimetric Method AOAC 925.45, 18 th Ed. (PIPAC AP 015)
	Ash	Gravimetric Method AOAC 900.02, 18 th Ed. (PIPAC AP 015)
	Crude Protein	Modified Kjeldahl Method AOAC 920.176/ 981.10/ 928.08, 18 th Ed. (PIPAC AP 017)
	Total Fat	Ether Extraction/ Gravimetry AOAC 922.06, 18 th Ed. (PIPAC AP 016)
IV. WATER		
01.0 Bottled Water	pH	pH meter SMEWW 4500-H ⁺ B , 22 nd Ed./ PNS 23:2002 (PIPAC AP 007)
	Arsenic	Atomic Absorption Spectrophotometry SMEWW 3114B, 22 nd Ed. (PIPAC AP 011)

	Conductivity	Conductivity Meter SMEWW 2510B, 22 nd Ed. (PIPAC AP 008)
	Total Solids Total Suspended Solids Total Dissolved Solids	Gravimetry SMEWW 2540 B,C, D, 22 nd Ed. (PIPAC 013)
	Hexavalent Chromium	UV-Vis Spectrophotometry SMEWW 3500-Cr B, 22 nd Ed. (PIPAC 014)
	Heavy Metals (Ca, Cd, Cr, Cu, Fe, K, Mn, Mg, Na, Ni, Pb, Zn)	Inductively-Coupled Spectrometry SMEWW 3030A, E/ 3120B, 22 nd Ed. (PIPAC 026)

Legend to Reference Methods

AOAC – Association of Official Analytical Chemists

SMEWW - Standard Methods for Examination of Water and Wastewater

***** Nothing Follows *****