Food components, INFOODS tagnames and recommended units

Adapted table from Annex 1 of the FAO/INFOODS Guidelines for Checking Food Composition Data prior to the Publication of a User Table/Database, version 1.0. (FAO, 2012; available at: http://www.fao.org/infoods/infoods/standards-guidelines/en/) and presents an extract of food components, recommended units and INFOODS tagnames (and corresponding EuroFIR component identifiers plus additional fields needed to identify corresponding tagname)

The table below presents a selection of the INFOODS food components identifiers, also called tagnames. For more information and additional tagnames, see INFOODS (2013), Klensin et al. (1989), and Charrondiere et al. (2011, Module 4b).

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)

Edible portion	**EDIBLE:** edible portion coefficient.		• It is recommended that values for the edible part (or the inedible part/refuse) be recorded in the user FCT/FCDB for each food entry (if information is available).
			• These values are needed:
			  ○ for a good food description;
			  ○ to transform the weight of foods as purchased to the edible parts of the food;
			  ○ to facilitate a correct food matching.
			• Different terms (e.g. edible portion, inedible portion/refuse) and modes of expression (e.g. percentage %, or coefficient) exist.
				EDIBLE

[1] Recommended unit

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
			Examples on how to calculate edible coefficients for cooked foods based on raw foods (for foods where the inedible part is not discarded e.g. meat and fish with bones) are given in *Annex 3* of FAO/INFOODS Guidelines for checking food composition data prior to publication of a user table/database (2012).	
Energy	**ENERC**: energy, total metabolisable; calculated from the energy-producing food components. More tagnames exist, but are generally not used in user tables/DB.	kJ (kcal)	• Energy values of foods presented in the FCT/FCDB should always be calculated in ones´ own DB, by applying the `metabolisable energy` conversion factors from Atwater. Different `metabolisable energy` conversion factors are listed in *Annex 3*. INFOODS recommends using the ´General Atwater factors including for dietary fibre´ for use in user FCT/FCDB. It is not advisable to calculate kJ energy values from energy values in kcal, because this may introduce bias. Energy conversion factors in kJ are neither exactly 4.184 nor 4.2 times higher than energy conversion factors in kcal; it may just give an indication.	**ENERC**
Water	**WATER**: water. Synonyms: moisture.	g	• Values for water are required at all levels of data management including archival, reference and user FCT/FCDB. Water is the most important component to check and be published in user FCT/FCDB. • Water is required to calculate the nutrient values to per 100 g fresh weight of edible portion (EP) when, in the literature, nutrient values were reported on dry matter basis (DM). • DM values are not published in user FCT/FCDB, but in the scientific literature nutrient values are often reported per 100 g DM. Values reported in DM can be recalculated to fresh weight, if the DM value or the water value of the fresh food is given. Example:	**WATER**

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
			Calculate values from per DM to per 100 g EP: Nutrient value (NV) (g/100 g EP) = NV(g/100 g DM) x (100-water)/100.	
Protein and nitrogen components	**PROTCNT:** protein, total; calculated from total nitrogen. **XN:** conversion factor for calculating total protein from total nitrogen. **NNP:** non-protein nitrogen. **PROTCNP**: protein, total; calculated from protein nitrogen. **NT**: nitrogen, total.	g	• Values for protein are required at all levels of the data system (archival, reference and user DB). • Protein is usually a calculated value derived from total nitrogen value multiplied by nitrogen conversion factors. • Nitrogen to protein conversion factors (XN) are given in *Annex 3*. Nitrogen, total (NT) should be part of archival, reference and comprehensive user FCT/FCDB, but must not necessarily be part of a concise/abridged user FCT/FCDB. PROTCNT and PROTCNP were originally published in 1989 as PROCNT and PROCNP.	**- PROT**+MI -Conversion factors are Method Parameters -no correspondence for NNP - **PROT**+MI **NT**

Total fat, fatty acids and lipid components	**FAT**: fat, total. Sum of triglycerides, phospholipids, sterols and related compounds. The analytical method is a mixed solvent extraction.
	Synonym: total lipid.
	FATCE: fat, total; derived by analysis using continuous extraction. The Soxhlet method has often been used to analyse for total fat using continuous extraction.
		g	**Fat**
			• Fat values are required at all levels of the database management (archival, reference and user DB).
			• Fat values are highly method depended:
			  ○ FAT is the preferred method;
			  ○ FATCE: fat, total, Soxhlet, should be avoided since it leads to incomplete extraction and therefore results in lower values in particular for foods with high amounts of polar and bound lipids.
			• Fat and water values are important to check the food description and
				FAT+MI
				
				FAT+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	This method tends to underestimate the total fat value of a food. **FAMS**: fatty acids, total monounsaturated. **FAPU**: fatty acids, total polyunsaturated. **FASAT**: fatty acids, total saturated. **FATRN**: fatty acids, total trans. **FAPUN3**: fatty acids, total n-3 polyunsaturated. **FAPUN6**: fatty acids, total n-6 polyunsaturated.		the concordance between foods. Fat contents of foods need to be compared when estimating values for fat-soluble components (e.g. fat-soluble vitamins, fatty acids) from other sources. If the difference in fat values between the food in one's own DB and in the referenced source is higher than 10 %, the values for fat soluble components need to be adjusted. **Fatty acids** • Individual fatty acids should be included in the reference DB. In concise user tables/DB the fatty acids may be grouped in total saturated, total monounsaturated and total polyunsaturated fatty acids. Fatty acid should be expressed in mg/100 g fresh weight of the edible portion (EP). In the literature fatty acids are often expressed differently including per g or 100 g fatty acids or fat. See the FAO/INFOODS Guidelines on Conversion among different Units, Denominators and Expressions (FAO/INFOODS, 2012a) for further information.	**FAMS** **FAPU** **FASAT** **FATRS** **FAPUN3** **FAPUN6**
Carbohydrates	**CHOAVL**: carbohydrates, available. This value includes the free sugars plus dextrins, starch, and glycogen. **CHOAVLM**: carbohydrates, available; expressed in monosaccharide equivalents. This value includes the free sugars plus dextrin, starch and glycogen. **CHOAVLDF**: carbohydrates, available; calculated by difference. This values is calculated:	g	**Carbohydrates** • Values for carbohydrates are required throughout the entire database system (archival, reference and user DB) . • The main difference in carbohydrates relates to: ○ whether or not fibre is included, ○ if it is analysed or calculated by difference, ○ if the value is expressed in anhydrous form or monosaccharide equivalents. • Generally, available carbohydrates are always preferred to total carbohydrates, because available carbohydrates represent only the carbohydrates available to the human body.	**CHO**+MI **CHO**+MI+unit **CHO**+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	100 - (weight in grams [water + protein + fat + ash + alcohol + dietary fibre] in 100 g of food). **CHOCDF**: carbohydrates, total; calculated by difference. This value is calculated: 100 - (weight in grams [water + protein + fat + ash + alcohol] in 100 g of food). **CHOCSM**: carbohydrates, total; calculated by summation. This value is the sum of the sugars, starches, oligosaccharide, and dietary fibre.		• The most recommended expression is available carbohydrates by summation (CHOAVL). This method, however, demands analytical values; in case analytical data are not available for most foods, it is recommended to use ´carbohydrates, available by difference´ (CHOAVLDF) (FAO, 2003). **Starch** • Starches including glycogen and polysaccharides should be part of a comprehensive user DB . **Oligosaccharides** • Are defined as carbohydrates with 3 to 9 monomeric units. • Some oligosaccharides can be included in dietary fibre, if they are resistant to digestion in the intestine. • In many foods oligosaccharides are in small amounts and are, therefore, not included in user tables/DB. **Sugars total** • In many user tables/DB sugars are defined as mono-and disaccharides. Sugars should be part of a concise user FCT/FCDB and individual mono, di -and oligosaccharides as well as polyols should be part of a comprehensive user FCT/FCDB.	**CHOT**+MI **CHOT**+MI
Fibre	**FIBTG**: fibre, total dietary; determined gravimetrically by the AOAC total dietary fibre method. (Prosky method) Sum of the water-soluble components and the water-insoluble components of dietary fibre.	g	• Dietary fibre values are required at all levels of the database system (archival, reference and user DB). • The values for fibre are method-depended and therefore need to be identified by the method used. Any calculation including fibre (e.g. sum of proximates, or carbohydrates calculated by difference) will be impacted by how the fibre content was determined. • New methods for dietary fibre have been developed which include all	**FIBT**+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	FIBTS: fibre, total dietary; sum of non-starch polysaccharide components and lignin (Southgate method) . **PSACNS/NSP**: non-starch polysaccharide, (Englyst fibre). This includes non-starch polysaccharides but excludes lignin, resistant starch and resistant oligosaccharides. **FIBAD**: fibre; determined by acid detergent method. Includes cellulose, lignin and some hemicellulose. **FIBADC**: fibre, acid detergent method, Clancy modification. **FIBINS**: fibre, water-insoluble. Sum of insoluble components from the AOAC total dietary fibre method; includes primarily lignin, cellulose, and most of the hemicelluloses. **FIBSOL**: fibre, water-soluble. **FIBND**: fibre; determined by neutral detergent method. Includes lignin, cellulose, and insoluble hemicellulose. **FIBC**: fibre, crude.		residual starch and resistant oligosaccharides. As these methods are still under development, it is suggested to wait for finalization before including those values in the FCDB. As Codex definition for dietary fibre may include resistant oligosaccharides they may have to be included in FCDB in future. • INFOODS recommends using total dietary fibre by AOAC Prosky (FAO, 2003). • Dietary fibre by Prosky (FIBTG) captures most completely the components with dietary fibre functions, followed by FIBTS and PSACNS/NSP. It would be best to phase out the use of FIBAD, FIBADC, FIBND and FIBC in favour of one of the other methods for determining total dietary fibre, such as FIBTG. New fibre methods are being developed including non-digestible oligosaccharides for which new tagnames will be needed, once fully approved and used in FCTs.	**FIBT**+MI **NSP**+MI **FIBT**+MI **FIBT**+MI **FIBINS**+MI **FIBSOL**+MI **FIBT**+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
				FIBC+MI
Ash	**ASH**: ash.	g	**Ash** • Ash values are used in internal checks on the sum of proximates, in the calculation of available or total carbohydrates, by difference. Therefore, it should be part of the archival and reference DB but is often not included in a concise user FCT/FCDB. Ash values should be reported, if carbohydrates are calculated by difference. If no ash value is available an ash value needs to be estimated from a similar food. • Ash values give an approximation of the total inorganic material. **Inorganic constitutes** Sodium, potassium, calcium, magnesium, iron, zinc etc. should be part of a concise use FCT/FCDB. Iodine and selenium should be included if they are a public health concern.	**ASH**
Vitamin A and pro-vitamins	**VITA_RAE**: vitamin A; calculated by summation of the vitamin A activities of retinol and the active carotenoids. Total vitamin A activity expressed in µg retinol activity equivalent (RAE) = µg retinol + 1/12 µg ß- carotene + 1/24 µg other pro-vitamin A carotenoids (or RAE = µg retinol + 1/12 µg ß- carotene equivalent).	µg	**Vitamin A** • Total Vitamin A (VITA_RAE), or total vitamin A (VITA) are the recommended definitions to be used in user tables/DB. • Vitamin A expressed in international units IU are obsolete and should not be used anymore; however, if IU are used, it must be explicitly stated. • For conversion from International Units (IU) to µg retinol, β-carotene or other pro-vitamin A carotenoids and vitamin A in RE and RAE see FAO/INFOODS Guidelines on Conversion among different units, denominators and expressions (FAO/INFOODS, 2012a) . **Retinol**	**VITA**+MI+unit

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	VITA: vitamin A; calculated by summation of the vitamin A activities of retinol and the active carotenoids. Total vitamin A activity expressed in µg retinol equivalent (RE) = µg retinol + 1/6 µg ß- carotene + 1/12 µg other pro-vitamin A carotenoids (or RE = µg retinol + 1/6 µg ß- carotene equivalent). **CARTA**: alpha-carotene. All-trans alpha-carotene only. **CARTB**: beta-carotene. All-trans beta-carotene only. **CRYPXB**: beta-cryptoxanthin. **CARTBEQ**: beta-carotene equivalents. This value is the sum of the beta-carotene + 1/2 quantity of other carotenoids with vitamin A activity. β-carotene equivalent = 1 β-carotene + 0.5 α-carotene + 0.5 β –cryptoxanthin.		• In the United Kingdom, for retinol 'All-trans retinol equivalent' in µg is used = µg all-trans retinol + 0.75 µg 13-cis retinol + 0.90 µg retinaldehyde. **β- carotene/ β- carotene-equivalent** • It would be best to phase out β- carotene equivalents in favour of reporting individual carotenes and vitamin A. • In archival and reference DB, β- carotene equivalent should not be listed alone in the DB, but together with all contributing components. • In the user tables, (CARTBEQ) might be better to state, as it is more comprehensive and, in user DB, (CARTBEQ) should be accompanied by α- carotene, β-carotene and β- cryptoxanthin. • Components that are needed to calculate Vitamin A values: retinol, β-carotene, α-carotene, β- cryptoxanthin, their conversion factors to calculate VITA, VITA_RAE and CARTBEQ (β -carotene equivalent is not needed, if values for the single pro-vitamins are given in the DB). Lutein, lycopene and zeaxanthin do not have vitamin A activity.	**VITA**+MI+unit **CARTA** **CARTB** **CRYPXB** **CARTBEQ**
Vitamin D	**VITD**: vitamin D; calculated by summation of ergocalciferol and cholecalciferol. This definition is mostly used.	µg	• VITD is mostly used; some DBs also use VITDEQ (e.g. Danish or British food composition databases). • Vitamin D expressed in IU is not preferred; however, if used IU must be explicitly stated.	**VITD**+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	VITDEQ: vitamin D; Vitamin D3 + D2 + 5 x 25-hydroxycholecalciferol. **VITDA**: vitamin D; determined by bioassay. The nutrient values are generally higher than the values determined chemically. **ERGCAL**: ergocalciferol (D2); occurs in plant foods. **CHOCAL**: holecalciferol (D3); occurs in animal foods. **CHOCALOH**: 25-hydroxycholecalciferol.		IU divided by 40 should be the value for vitamin D reported in µg (1 IU vitamin D = 0.025 µg vitamin D (VITD)/vitamin D3 (CHOCAL). See also FAO/INFOODS Guidelines on Conversion among different units, denominators and expressions (FAO/INFOODS, 2012a).	**VITD**+MI **VITD**+MI **ERGCAL** **CHOCAL** **CHOCALOH**
Vitamin E	**VITE**: vitamin E; calculated by summation of the vitamin E activities of the active tocopherols and tocotrienols; expressed as α-tocopherol equivalents = α-tocopherol + 0.4 ß-tocopherol + 0.1 γ-tocopherol+ 0.01 δ-tocopherol+ 0.3 α-tocotrienol + 0.05 α-tocotrienol + 0.01 γ-tocotrienol **(mostly used)** = α-tocopherol + 0.5 ß-tocopherol + 0.1 γ-tocopherol+ 0.3 α-tocotrienol = α-tocopherol + 0.4 ß-tocopherol + 0.1 γ-	mg	• Generally user tables/DB use VITE. However, some user tables/DB report TOCPHA (e.g. USDA) In archival and reference DB, vitamin E (VITE) should not be listed alone in the DB, but together with all contributing components. It should be noted that the latest version of the DRIs published by NAS/IOM state that α- tocopherol is the active form of vitamin E and that the use of α- tocopherol equivalents is discontinued.	**VITE**+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	tocopherol + 0.01 δ-tocopherol **VITEA**: vitamin E; determined by bioassay. **TOCPHA**: α-tocopherol.			**VITE**+MI **TOCPHA**
Niacin	**NIA**: niacin, preformed. **NIAEQ**: niacin equivalents, total. Preformed niacin plus niacin equivalents from tryptophan . **NIATRP**: niacin equivalents, from tryptophan. 1/60 x tryptophan.	mg	Total niacin equivalent (NIAEQ) = niacin preformed (NIA) + 1/60 tryptophan (TRP).	**NIA** **NIAEQ**+MI+unit **NIATRP**
VIT B6	**VITB6C**: vitamin B-6, total; calculated by summation. Pyridoxal plus pyridoxamine plus Pyridoxine. **VITB6A**: vitamin B-6, total; determined by analysis.	mg		**VITB6**+MI **VITB6**+MI
Folate	**FOL**: folate, total. Includes both conjugated and free folate (determined by microbiological assay). Folate, total: food folates + fortified folic acid (if any) in processed food. **FOLSUM**: folate, sum vitamers. It includes mostly tetrahydrofolate, 5-	µg	• FOL is the recommended expression and generally yields higher values than FOLSUM. • FOLFD is to be used if FOL, FOLAC and/or FOLDFE are also reported. This is to distinguish the folate content in the food from the fortificant amount.	**FOL**+MI **FOL**+MI

Component	INFOODS tagnames	Unit[1]	Comments	EuroFIR component identifiers (MI= method indicator)
	methyltetrahydrofolate, 5-formyltetrahydrofolate, 10-formylfolic acid, 10-formyldihyrdofolate and folic acid (determined by HPLC). **FOLAC**: folic acid, synthetic folic acid used in fortification. **FOLFD**: folate food, naturally occurring food folates (determined by microbiological assay). **FOLDFE**: folate, dietary folate equivalents = food folate + 1.7 x synthetic folic acid.			**FOLAC** **FOL**+MI **FOL**+MI
Vitamin C	**VITC**: vitamin C. L-ascorbic acid plus L-dehydro-ascorbic acid. Usually analysed by HPLC. **ASCL**: L-ascorbic acid. Titrimetry can only analyse L-ascorbic acid. **ASCDL**: L-dehydro-ascorbic acid (= oxidized form of VITC).	mg	• VITC generally yields highest values. In fresh food however, VITC and ASCL should give comparable results, since the oxidized form of VITC, if existing, is very low. • In fresh foods the reduced form (ASCL) is the major one present but the amount of the dehydro-form (ASCDL) increases during cooking and processing.	**VITC** **ASCL** **ASCDL**

Sources for more information and additional tagnames:
INFOODS (2013). Tagnames for Food Components. Available at: http://www.fao.org/infoods/infoods/standards-guidelines/food-component-identifiers-tagnames/en/
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http://www.fao.org/fileadmin/templates/food_composition/images/Klensin_et_al_1989_Identification_of_food_components_for_I%E2%80%A6.pdf
Charrondiere UR, Burlingame B, Berman S, Elmadfa I (2011) Food Composition Study Guide – Questions and Exercises (volume 1) and Answers (volume 2). 2nd version. FAO, Rome. Modules 10 and 10.a. Available at: http://www.fao.org/infoods/infoods/training/en/