HOW TO CALCULATE NUTRIENT CONTENT OF FOODS

A GUIDELINE FOR FOOD BUSINESS OPERATORS

A step-by-step guideline to calculation of nutrient content of foods for nutrition declaration according to the Regulation (EU) No 1169/2011 on the provision of food information to consumers.

Based on recommendations of the European Food Information Resource Association – EuroFIR AISBL (www.eurofir.org)

Introduction

Nutrition declaration or nutrition labelling means providing information on the presence of energy and certain nutrients on food labels [(1)].
The Regulation (EU) No 1169/2011[(1)] on the provision of food information to consumers (hereafter: "the Regulation") introduces rules for generation of mandatory (energy value, amounts of fat, saturates, carbohydrate, sugars, protein and salt) and supplementary (amounts of mono-unsaturated and, polyunsaturated fats, polyols, starch, fibre, and certain vitamins and minerals) nutrition declaration for labelling of foods. The declared values shall, according to the individual case, be average values based on:

1. "the manufacturer's analysis of the food;
2. a calculation from the known or actual average values of the ingredients used;
3. a calculation from generally established and accepted data. Calculation of energy value using the conversion factors listed in Annex XIV of this Regulation."[(1)]

Tolerances for nutrition labelling purposes were defined considering variations of nutrient levels labelled due to natural variations and variations from production and during storage[(2)].

A detailed procedure for calculation of nutrition values of foods (hereafter "recipe calculation") is not described in the Regulation.

The European Food Information Resource Association (EuroFIR AISBL- www.eurofir.org) has reviewed recipe calculation procedures used in European food composition databases [(3,4,5)]. Based on EuroFIR expertise and knowledge, a harmonized procedure for recipe calculation [(3,6)] that is applicable for calculation of nutrition values of foods was proposed.

General steps of a recipe calculation based on the EuroFIR proposal are presented in this guideline that is aimed as a tool for food manufacturers, retailers, caterers and others interested in nutrition labelling.

Recipe calculation is a legally accepted alternative to food analysis. Nevertheless it is only a model and cannot account for all processes occurring in foods during their preparation. Results obtained by calculation should be always regarded as approximations [(7)]. The suitability of recipe calculation for nutrition labelling is the responsibility of food businesses.

With respect to the limitations of recipe calculation it is recommended to determine nutrient content of foods for nutrition labelling purposes by laboratory analysis whenever possible.

Terminology of the guideline

Food [8]	Any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans.
Nutrient [1]	Protein, carbohydrate, fat, fibre, sodium, vitamins and minerals listed point 1 of Part A of Annex XIII of the Regulation, and substances which belong to or are components of one of those categories
Ingredient [1, 3]	Any substance or product, including flavourings, food additives and food enzymes, and any constituent of a compound ingredient, used in the manufacture or preparation of a food and still present in the finished product, even if in an altered form; residues shall not be considered as 'ingredients'. Foods with nutrition data obtained by recipe calculation can also be used as ingredients of a recipe.
Input ingredient	For the purpose of this guideline - any ingredient used in a recipe.
Recipe [3]	A description of preparation (manufacturing steps) and a list of ingredients, including the amounts, which are needed to prepare a composite food.
Edible portion [3]	Amount of edible material remaining after the inedible waste (e.g. bones, stones, peel) has been trimmed away.
Yield factor [3, 5]	The final weight of food that is retained after food preparation, processing or other treatment in relation to absolute weight of food before preparation. Weight may change due to losses or gains of water or/and fat.
Retention factor [3]	Content of nutrients retained after food preparation, processing or other treatment. Retention factors are available predominantly for processes involving heat treatment. In the Regulation, retention factors are not given. The Regulation mentions "conversion factors" (article 31, point 2). Commission my adopt conversion factors for vitamins and minerals in order to calculate more precisely their content in foods [1].
Food composition database	Organized data about chemical composition of foods.
Recipe calculation	A procedure of calculation of nutrition values of foods. Calculation methods are based on knowledge of the amount of ingredients in a recipe for a food product, dish, meal; data about nutrient composition of ingredients and special factors considering changes in nutrient content and weight of foods during their preparation.
Cooked (Final?) food	For the purpose of this guideline – food after heat or non-heat preparation, processing or treatment.
Raw weight	For the purpose of this guideline - total weight of input ingredients.
Cooked (Final?) weight	For the purpose of this guideline - total weight of final food after heat or non-heat preparation, processing or treatment.

Recipe calculation in 10 steps

Based on the EuroFIR proposal for recipe calculation [6]

Step 1- List of ingredients

Make a list of input ingredients in the recipe.

Ingredient
Ingredient A
Ingredient B
Ingredient C

Note:

1. Do not include the amount of water used as cooking medium for cooking rice, pasta, potatoes, legumes, etc. in recipe calculation[9].
2. For calculation of water content follow recommendation on page 12 or practical examples of calculation (future WEB LINKS to them).

Step 2 –Weight of input ingredients

Fill in weight of input ingredients in g. Ingredients (raw or cooked) are in the ready-to-cook state (i.e. weight without inedible parts)

Ingredient	**Weight of ingredients g**
Ingredient A	A (g)
Ingredient B	B (g)
Ingredient C	C (g)

Notes:

1. If necessary, convert household measures (e.g. cups, spoons, litres) to weight in g.
2. In foods with fat used as a cooking medium (e.g. frying), insert only the amount of fat absorbed.
3. You may introduce correction for any wastage due to ingredients left on utensils and in the vessels used in preparation [10]

Step 3 – Total raw weight of input ingredients

Sum weight of input ingredients to determine raw weight of the food.

Ingredient	**Weight of ingredients g**
Ingredient A	A (g)
Ingredient B	B (g)
Ingredient C	C (g)
Raw weight	A + B + C (g)

Step 4- Weight of cooked food

Determine weight of cooked food.

Ingredient	**Weight of ingredients g**
Ingredient A	A (g)
Ingredient B	B (g)
Ingredient C	C (g)
Raw weight	A + B + C (g)
Cooked weight	(A+ B+ C)* YF (g)

Notes :

1. Some recipe books document cooked weight.
2. Use a cooking test to determine your own weight yield factor (YF) for your recipe. Document your own YFs for future use.

   Yield factor (YF) = Total cooked weight (g) /Total weight of raw ingredients (g)
3. You may apply a yield factor borrowed from literature (e. g. tables collected by Bognar [9] or Bergström [11]) for a similar food or dish.
4. Depending on the recipe requirements yield factors applied may be related to the edible part only or include waste (e.g. chicken thigh with bones).

Step 5- Food composition data of input ingredients

Search for nutrient content of input ingredients per 100 g edible part. Use data available in your national food composition database/table, whenever possible.

Ingredient	**Weight of ingredients g**	**Content of nutrient X in g per 100 g input ingredient**
Ingredient A	A (g)	X_A g/100g
Ingredient B	B (g)	X_B g/100g
Ingredient C	C (g)	X_C g/100g
Raw weight	A + B + C (g)	
Cooked weight	(A +B + C)* YF (g)	

1. Collect data for all nutrients you need for ingredients used in your recipe. Check compliance of the selected nutrients with the definitions as given in the Regulation[(1)]: specific definitions in the Annex I and definition of units of measurement for nutrition declaration as specified in Annex XIII (g, mg, μg).
2. In this example, unit of nutrient X in g is considered. Calculation with other units of measurement (mg or μg) is also possible.
3. In case of missing data:
    a. Borrow data from other national FCDs: http://www.eurofir.org/?page_id=96
    b. Ask your supplier of the ingredient for food composition data
    c. Search for other reliable sources of data (e.g. scientific papers, reports etc.). You may ask compliers of your National FCD or EuroFIR for help.
    d. Analyse the ingredient in laboratory
    e. Consider amount used in recipe and its impact on the final nutrition information [(12)]. If the ingredient is used in insignificant amounts and you evaluate that it has a negligible impact on nutrient value, you may omit the amount of this ingredient in the recipe calculation.
4. Be sure that all borrowed data comply with your needs with respect to units (e.g. g, mg, μg) and definition of nutrients (e.g. protein, carbohydrate, vitamins).
5. Data in food composition tables are usually presented per 100 g edible portion without inedible parts of foods. Depending on the recipe, data for foods with (e.g. chicken, whole) or without (chicken, meat only) waste may be used. You may calculate the content of food “as purchased” (with waste) by multiplying the 100 g edible portion composition by the value of the edible portion coefficient.
6. Data in food composition tables are presented as average values. They were collected at a particular period with a particular set of samples. Be aware that food is a biological matrix, in which composition can vary due to different factors (season, food processing, handling and different sources of ingredients) [(12)]. Composition of your ingredient may be thus different from data given in food composition databases/tables.
7. Do not borrow data on energy values. They should be always calculated (see Step 10).

Step 6 – Calculation – content of nutrients in cooked food without using retention factors

In this stage of calculation, results are not adjusted to changes of nutrients during cooking or food preparation. So called "retention factors" indicating retention of nutrients during cooking or food preparation are not applied.

Calculate the content of nutrient (Y) **-** per 100 g of final weight **WITHOUT** retention factors taken into account**:**

$$\textbf{Nutrient X per 100 g (Y)} = \textbf{Nutrient content X per 100 g ingredient} * \frac{\textbf{Raw weight of ingredient (g)}}{\textbf{Total cooked weight (g)}}$$

Apply this calculation for each ingredient.

The total content of nutrient X in the cooked food is the sum of its content in each ingredient ($Y_A+Y_B+Y_C$).

Ingredient	**Weight of ingredients g**	**Content of nutrient X in g per 100 g input ingredient**	**Content of nutrient X in g per 100 g of cooked food before using retention factor (Y)**
Ingredient A	A (g)	X_A g/100g	**Y_A g**
Ingredient B	B (g)	X_B g/100g	**Y_B g**
Ingredient C	C (g)	X_C g/100g	**Y_C g**
Raw weight	A+B + C (g)		
Cooked weight	(A+B+C)* YF (g)		**($Y_A+Y_B+Y_C$) g**

Notes:

1) Retention factors for the purpose of recipe calculation are not given in the Regulation. Introduction of "conversion factors" for vitamins and minerals may be adopted by the Commission (article 31, point 2) [(1)]. It could be only anticipated that the term "conversion factors" refers to "retention factors".
2) Future use of "conversion factors" for other nutrients (e.g. protein, fat, etc.) is not mentioned in the Regulation.
3) For the purpose of nutrition labelling, retention factors are not likely to be used in practice very often, because not many foods will declare content of vitamins or minerals.
4) If you consider that you do not need to use retention factors, you may stop your calculation at this step and round the calculated data (Step 9).
5) If you need to consider the influence of cooking or food preparation on nutrient content of a particular nutrient, continue the calculation with retention factors (Step 7).

Step 7- Retention factors

Retention factors indicate content of nutrients retained after food preparation, processing or other treatment.
The main sources of retention factors are tables collected within the EuroFIR project (retention factors for vitamins and nutrients) [6] and so called "Bognar tables" [9] (retention factors for a broad list of nutrients – protein, fat, fibre, minerals (incl. cooking salt), vitamins etc.).
In the case you need to calculate your recipe with retention factors, evaluate your recipe and treatments applied. Collect data about the appropriate retention factors for your selected nutrients.

Ingredient	**Type of heat treatment/s (H) depending on recipe**	**Retention factor for nutrient X**
Ingredient A	H1	RF_{AH1}
Ingredient A	H2	RF_{AH2}
Ingredient B	H1	RF_{B}
Ingredient C	H1	RF_{C}

Notes:

1) Retention factors were collected predominantly for cooking methods used for preparation of dishes at home or by catering services.
2) Retention factors are not available for all cooking methods and all foods.
3) In the case of a missing factor for a food, try to find factors for a similar food.
4) EuroFIR experts evaluated the existing retention factors and recommend the following general rules according to the group of retention factors [6].

Retention factor group	General description of heat treatment	Use for cooking method
Cooked by dry heat	Cooked at moderate to high levels of heat (140-350°C), no liquid added or only small amounts of fat to prevent sticking	Baked or roasted, broiled or grilled, charcoal broiled, popping, toasting, reheating by dry heat.
Cooked by moist heat	Cooked in varying amount of water, water – based liquid or steam (100-125°C)	Cooked in steam, boiled (drained or undrained), braised, simmered, steeped, microwave cooking, cooked in water/steam bath, reheated (microwave, in bag, in pan or cooking utensil)
Cooked with fat and oil	Fried, 140-200°C	Fried, deep fried

5) Information about retention factors for industrial processes and manufactured foods is predominantly missing. For some processes the above retention factors groups may be used.

Step 8- Calculation – content of nutrients in cooked food with retention factors

Calculation with retention factors adjusts effects of cooking or processing on nutrient content of foods.

Apply the corresponding retention factor/s (RF) for the nutrient X for each ingredient and calculate nutrient content (Z) after cooking/processing.

$$\textbf{Nutrient X per 100 g (Z)} = \textbf{Nutrient content per 100 g ingredient} * \frac{\textbf{Raw weight of ingredient (g)}}{\textbf{Total cooked weight (g)}} * \textbf{Retention factor}_{H1} * \textbf{Retention factor}_{H2}$$

Use this calculation for each ingredient.

The total content of nutrient X in cooked food is the sum of its content in each ingredient **($Z_A+Z_B+Z_C$).**

Round the obtained data (Step 9).

Ingredient	**Raw weight g**	**Content of nutrient X in g per 100 g input ingredient**	**Content of nutrient X in g per 100 g of cooked food before using retention factor (Y) – Step 6**	**Retention factor for nutrient X**	**Content of nutrient X in g per 100 g of final food after using retention factor (Z)**
Ingredient A	A (g)	X_A g/100g	Y_A g	RF_{AH1}	$(Y_A)*(RF_{AH1})*(RF_{AH2}) = \mathbf{Z_A}$
Ingredient A	A (g)	X_A g/100g	Y_A g	RF_{AH2}	
Ingredient B	B (g)	X_B g/100g	Y_B g	RF_B	$(Y_B)*(RF_B) = \mathbf{Z_B}$
Ingredient C	C (g)	X_C g/100g	Y_C g	RF_C	$(Y_C)*(RF_C) = \mathbf{Z_C}$
Total raw weight of ingredients	A+B + C (g)				
Total cooked weight	(A+B+C)* YF (g)		$(Y_A+Y_B+Y_C)$ g		**$(Z_A+Z_B+Z_C)$ g**

Notes:

1) Some processes may involve more than one heat treatment method. In this case, use an appropriate number of retention factors for a nutrient. The order of the factors used does not make a difference.
2) Not all manufacturing processes can be simulated by recipe calculation. Evaluate suitability of recipe calculation for nutrition declaration of your products.

Step 9- Rounding final values

Round your final values in compliance with the Guidance Document [2] to the Regulation (EU) No 1169/2011: (http://ec.europa.eu/food/food/labellingnutrition/nutritionlabel/guidance_tolerances_december_2012.pdf)

Table 4: Rounding guidelines for the nutrient declaration in nutrition labelling of foods

Nutritional element	Amount	Rounding
Energy		to nearest 1 kJ/kcal (no decimals)
Fat*, Carbohydrate*, sugars*, Protein*, fibre*, polyols*, starch*	≥10 g per100 g or ml	to nearest 1 g (no decimals)
	<10 g and > 0.5 g per 100 g or ml	to nearest 0.1 g
	no detectable amounts is present or concentration is ≤ 0.5 g per 100 g or ml	"0 g" or "<0.5 g" may be declared
Saturates*, Mono-unsaturates*, Polyunsaturates*	≥10 g per 100 g or ml	to nearest 1 g (no decimals)
	<10 and > 0.1 g per 100 g or ml	to nearest 0.1 g
	no detectable amounts is present or concentration is ≤ 0.1 g per 100 g or ml	"0 g" or "<0.1 g" may be declared
Sodium	≥1 g per 100 g or ml	to nearest 0.1 g
	<1 g and > 0.005 g per 100 g or ml	to nearest 0.01 g
	no detectable amounts is present or concentration is ≤ 0.005 g per 100 g or ml	"0 g" or "<0.005 g" may be declared
Salt	≥1 g per 100 g or ml	to nearest 0.1 g
	<1 g and > 0.0125 g per 100 g or ml	to nearest 0.01 g
	no detectable amounts is present or concentration is ≤ 0.0125 g per 100 g or ml	"0 g" or <0.01 g" may be declared
Vitamins and minerals	vitamin A, folic acid, chloride, calcium, phosphorus, magnesium, iodine, potassium	3 significant figures
	All other vitamins and minerals	2 significant figures

*Not applicable to sub-categories

Note: The rounding rules in the Guidance Document consider rounding up values ending with digit 5 (e.g. 11.5 is to be rounded to 12, 8.5 to be rounded to 9).

Step 10-Calculation of energy value

Calculate energy value of the cooked food or dish kJ and kcal using conversion factors for calculation of energy value given in the Annex XIV of the Regulation -(EU) No 1169/2011[(1)].

ANNEX XIV

CONVERSION FACTORS

CONVERSION FACTORS FOR THE CALCULATION OF ENERGY

The energy value to be declared shall be calculated using the following conversion factors:

— carbohydrate (except polyols),	17 kJ/g — 4 kcal/g
— polyols,	10 kJ/g — 2,4 kcal/g
— protein,	17 kJ/g — 4 kcal/g
— fat,	37 kJ/g — 9 kcal/g
— salatrims,	25 kJ/g — 6 kcal/g
— alcohol (ethanol),	29 kJ/g — 7 kcal/g
— organic acid,	13 kJ/g — 3 kcal/g
— fibre,	8 kJ/g — 2 kcal/g
— erythritol,	0 kJ/g — 0 kcal/g

Notes:

1. The range of nutrients included in calculation of energy value may vary depending on a type of food.
2. The following example considers contribution of four nutrients: protein (X_{PROT}), fat (X_{FAT}), carbohydrate (X_{CHO}), and fiber (X_{FIBT}).

   For calculation of energy value use the appropriate conversion factors:

   Energy (in kJ) = $17*(X_{PROT}) + 37*(X_{FAT}) + 17*(X_{CHO}) + 8*(X_{FIBT})$

   Energy (in kcal) = $4*(X_{PROT}) + 9*(X_{FAT}) + 4*(X_{CHO}) + 2*(X_{FIBT})$

An extra step: Calculation of water content

Content of water in foods is not mandatory for nutrition declaration. Nevertheless, content of water is an important parameter of food. Its calculation is optional but necessary for a general check of recipe calculation (see the End notes below).

The calculation procedure [10] comprises the following steps:

Steps 1-5 As described above
Step 6 Determine weight change on cooking: **Raw weight – cooked weight (g)**

Step 7 Determine content of water (g) in input ingredients (W): **Water content per 100 g ingredient ∗ Weight of input ingredient in the recipe /100** (g)
Apply to all ingredients.
Step 8 Determine content of total water in input ingredients: sum water content in each ingredient (W_A+W_B+W_C)

Ingredient	**Weight of ingredients g**	**Content of water in g per 100 g of input ingredient**	**Content of water in g in input ingredients**
Ingredient A	A (g)	X_A g/100g	W_A g
Ingredient B	B (g)	X_B g/100g	W_B g
Ingredient C	C (g)	X_C g/100g	W_C g
Raw weight	A+B + C (g)		
Cooked weight	(A+B+C)* YF (g)		**(W_A+W_B+W_C) g**
Weight change on cooking	Raw weight – cooked weight (g)		

Step 9 Determine water content in g per 100 g of cooked food

$$\textbf{Water content in g per 100 g of cooked food} = \frac{\textbf{total content of water in input ingredients – (weight change on cooking)}}{\textbf{Weight of cooked food}} * \textbf{100}$$

End notes

Document your recipe calculation carefully (recipe ingredients and procedure, sources of food composition data, retention factors, yield factors and method of calculation).

Verify results of recipe calculation expressed per 100 g edible portion by simple summation of values for the main nutrients and water. Sum values for fat, carbohydrate, fiber, protein, ash (salt), alcohol, and water. The preferable range of summation is 97 – 103 g, the acceptable range is 95-105 g.

You may use this procedure for checking of food composition data of your ingredients.

Examples of recipe calculations are given on the Internet at WEB LINK (a link to a page with examples)

Users of this guideline should be aware of the following:

Recipe calculation produces **estimates** of nutrient content [(7)]. Results should be always regarded as approximations. Changes occurring during processing of foods are very complex. It is not possible to consider them all by calculation of nutrition values of foods. Recipe calculation is to be used with caution.

Calculations are not applicable to all processes used in food industry (e.g. fermentation used for yoghurt production).

It is recommended to check outputs of a recipe calculation by chemical analysis of a product in order to make a decision whether calculation is an acceptable method for a particular type of food.

Nutrient composition of foods and ingredients can vary substantially because of a number of factors.

Calculations should be performed by a person with appropriate skills in recipe calculation procedures and basic knowledge about food chemistry.

Chemical analysis of foods in laboratories is a preferred method for nutrition declaration, especially in products bearing health claims or declaring content of vitamins and minerals.

Make sure that National authorities and food inspection bodies accept the EuroFIR recipe calculation procedure.

Neither national food composition database center nor EuroFIR make any warranty that results obtained according to this guidance will be free from error. They undertake no liability to pay any damages neither direct nor indirect losses associated with using this guideline. ;

References (all links cited below were accessed on 12.8.2014)

1. Regulation (EU) No. 1169/2011 of the European Parliament and the Council of 25 October 2011 on the provision of food information to consumers. Official Journal of the European Union, L304, 22.11.2011, p. 18. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:304:0018:0063:EN:PDF
2. European Commission. (2012) Guidance document for competent authorities for the control of compliance with EU legislation on Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers … with regard to the setting of tolerances for nutrient values declared on a label. http://ec.europa.eu/food/food/labellingnutrition/nutritionlabel/guidance_tolerances_december_2012.pdf
3. Reinivuo, H., Laitinen, K. (2007) Proposal for the harmonization of recipe calculation procedures. WP2.2 Composite Foods. April 2007. EuroFIR http://www.langual.org/Download/RecipeCalculation/Final_recipe_calc_harmonisation.pdf
4. Reinivuo, H. (2007) Inventory of recipe calculation documentations of EuroFIR partners. An annex to the report of Proposal for the harmonisation of recipe calculation procedures (D2.2.12/M2.2.4), May 2007. EuroFIR http://www.fao.org/uploads/media/reinivuvo_2007_Eurofir_inventory_recipes_D2.2.12_M2.2.4_02.pdf
5. Bell et al. (2006) Report on Nutrient Losses and Gains Factors used in European Food Composition Databases. (D1.5.5), EuroFIR http://www.langual.org/Download/RecipeCalculation/Bell%20et%20al%20-%20Report%20on%20Nutrient%20Losses%20and%20Gains%20Factors%20used%20in%20European%20Food%20Composition%20Databases.pdf
6. Vásquez-Caicedo, A.L, Bell, S., Hartmann, B. (2008) Report on collection of rules on use of recipe calculation procedures including the use of yield and retention factors for imputing nutrient values for composite foods (D2.2.9), March 2008. EuroFIR http://www.eurofir.org/?page_id=2695
7. Rand, W.M., Pennington, J.A.T., et. al. (1991): Compiling data for food composition databases. Hong Kong, United Nations University Press. http://archive.unu.edu/unupress/unupbooks/80772e/80772E00.htm
8. Regulation (EC) No 178/2002 of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. Official Journal of the European Union, L31, 1.2.2002, p. 1 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002R0178
9. Bognar, A. (2002): Tables on weight yield of food and retention factors of food constituents for calculation of nutrient composition of cooked foods (dishes). Karlsruhe http://www.mri.bund.de/fileadmin/Veroeffentlichungen/Archiv/Schriftenreihe_Berichte/bfe-r-02-03.pdf.
10. McCance and Widdowson's The Composition of Foods. Sixth summary edition, 2002. Cambridge. Royal Society of Chemistry.
11. Bergström, L. (1994). Rapport 32/94: Nutrient Losses and Gains in the Preparation of Foods. National Food Administration, Sweden, p. 18; p. 37-41. http://www.slv.se/upload/dokument/rapporter/mat_naring/1994_32_Livsmedelsverket_nutrient_losses_and_gains.pdf
12. Food Standards Australia New Zealand. (2011).Nutrition Panel Calculator. Explanatory Notes. April 2011. Canberra. Food Standards Australia New Zealand. http://www.foodstandards.gov.au/industry/npc/Documents/Explanatory%20notes%20for%20the%20NPC%2011082011.pdf

The draft proposal of the guideline was prepared by compliers of the Czech Food Composition Database (http://www.nutridatabaze.cz) and the Slovak Food Composition Database (http://www.pbd-online.sk) on the basis of EuroFIR proposal for recipe calculation [(6)].

Marie Machackova (Institute of Agricultural Economics and Information, Prague, Czech Republic)
Anna Giertlova and Janka Porubska (Food Research Institute, Bratislava, Slovak Republic)

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