



EuroFIR Guideline on calculation of nutrient content of foods for food business operators



Marie Machackova^{a,*}, Anna Giertlova^b, Janka Porubská^{b,c}, Mark Roe^d, Carlos Ramos^e, Paul Finglas^{d,e}

^a Institute of Agricultural Economics and Information, Manesova 1453/75, 120 00 Prague 2, Czech Republic

^b National Agricultural and Food Centre, Food Research Institute, Priemyselna 4, 824 75 Bratislava, Slovak Republic

^c University of Presov, Faculty of Humanities and Natural Sciences, Department of Ecology, 17. novembra 1, 081 16 Presov, Slovak Republic

^d Institute of Food Research, Norwich Research Park, Colney, Norwich NR4 7UA, United Kingdom

^e EuroFIR AISBL, Rue Washington, 40, 1050 Brussels, Belgium

ARTICLE INFO

Article history:

Received 22 July 2016

Received in revised form 27 February 2017

Accepted 18 March 2017

Available online 21 March 2017

Keywords:

Nutrition declaration

EU regulation

EuroFIR harmonised recipe calculation procedure

Guideline for calculating nutrient content

Food business operators

EuroFIR

ABSTRACT

This paper presents a Guideline for calculating nutrient content of foods by calculation methods for food business operators and presents data on compliance between calculated values and analytically determined values. In the EU, calculation methods are legally valid to determine the nutrient values of foods for nutrition labelling (Regulation (EU) No 1169/2011). However, neither a specific calculation method nor rules for use of retention factors are defined. EuroFIR AISBL (European Food Information Resource) has introduced a Recipe Calculation Guideline based on the EuroFIR harmonized procedure for recipe calculation. The aim is to provide food businesses with a step-by-step tool for calculating nutrient content of foods for the purpose of nutrition declaration. The development of this Guideline and use in the Czech Republic is described and future application to other Member States is discussed. Limitations of calculation methods and the importance of high quality food composition data are discussed.

© 2017 Published by Elsevier Ltd.

1. Introduction

The most reliable method to obtain data on nutrient content of foods is by direct analysis of foods using accredited laboratories. However, food analyses are relatively expensive, especially for components that are more complex and time consuming to analyse. Increasing abundance and variety of composite foods available to consumers makes it impractical to analyse them all (Reinivuo, Bell, & Ovaskainen, 2009).

A procedure for obtaining nutrient content of foods by calculation methods (thereafter as recipe calculation) is used as an alternative approach to determine nutrient values of multi-component foods (Rand, Pennington, Murphy, & Klensin, 1991). Common recipe calculation is based on the amount of ingredients given in a recipe for a food, nutrient composition of ingredients and factors that consider changes in nutrient content (retention factors, Bognár, 2002; Vázquez-Cañedo, Bell, & Hartmann, 2008) and weight (yield factors, Bergström, 1994; Bognár, 2002; Showell et al., 2012) during preparation.

An inventory performed within the EU FP6 EuroFIR (European Food Information Resource Network of Excellence, 2005–2010) project revealed several different recipe calculation procedures and varied retention and yield factors in use by European food composition database compilers (Bell, Becker, Vázquez-Cañedo, Hartmann, Møller, & Buttriss, 2006; Reinivuo, 2007; Reinivuo & Laitinen, 2007; Reinivuo et al., 2009). Outputs of the EuroFIR inventory, experience gained from previous European harmonization activities (Bognár & Piekarski, 2000; Unwin, 2000), a brief history of activities (Reinivuo et al., 2009) and discussions within the community of EuroFIR experts resulted in a proposal for a harmonized recipe calculation procedure, which applies the yield factor at the recipe level (i.e. equally to all ingredients) and the retention factors to each individual ingredient (Vázquez-Cañedo et al., 2008). This procedure was suggested for use including a set of standardized EuroFIR retention factors for vitamins and minerals based on the EuroFIR food group classification system and by cooking method using LanguaL™ Thesaurus facets (Vázquez-Cañedo et al., 2008). Applying this method “plus common retention factors in European food composition data results in a harmonized approach and reduces artificial errors and individual interpretations” (Westenbrink, Roe, Osereczuk, Castanheira, & Finglas, 2016). However, yield factors are not standardized and are selected from

* Corresponding author.

E-mail address: machackova.marie@uzei.cz (M. Machackova).

sources that are appropriate for the food or from direct measurements.

Significance of the harmonized recipe calculation procedure in Europe has increased in relation to EU legislation for food labelling – Regulation (EU) No 1169/2011 of the European Parliament and the Council of 25 October 2011 on the provision of food information to consumers [2011] OJ L304/18 (Regulation (EU) No 1169/2011). The Regulation introduces rules for generation of mandatory (energy value, amounts of fat, saturates, carbohydrate, sugars, protein and salt) and supplementary (content of mono and poly unsaturated fats, polyols, starch, fibre and certain vitamins and minerals) nutrition declarations for food labelling. The declaration of mandatory nutrients on pre-packed foods entered into force on 13th December 2016. Tolerances considering variations of nutrient levels in foods were also defined for food labelling, taking into account natural variations and variations from production and during storage of foods (European Commission, 2012). The Regulation (EU) No 1169/2011 permits a calculation procedure as an alternative to manufacturer's analysis of the food for obtaining values for nutrient labelling. However, neither specific calculation method nor rules for use of retention factors are given in the Regulation. Many food producers, particularly SMEs, have no experience of nutritional calculations or food composition data and could easily produce incorrect data, even if they make use of commercial nutritional software.

In this paper, the EuroFIR Guideline for recipe calculation is described and an evaluation of compliance between calculated and analysed values according to permitted tolerances is discussed. Implementation of the Guideline at national level in the Czech Republic and use in other Member States is discussed.

2. Materials and methods

2.1. Development of the Guideline

Experts from EuroFIR AISBL (www.eurofir.org), an international non-profit association whose mission is to ensure sustained advocacy for food information in Europe, undertook an initiative to develop a Guideline for calculation of nutrient values aimed at food business operators (food manufacturers, retailers, caterers and other stakeholders). The Guideline is based on the harmonized recipe calculation procedure proposed by EuroFIR as published in the report by Vásquez-Cacedo et al. (2008). The main goal of the Guideline is to provide food business operators with a step-by-step tool for calculating nutrient content for the purpose of nutrition declaration.

Definition of the Guideline concept was the initial step in its development. The key elements of the concept comprised:

- The calculation procedure based on the EuroFIR proposal for a harmonized recipe calculation procedure, involving application of a yield factor applied at recipe level and use of standardized EuroFIR retention factors at ingredient level;
- Organization of the Guideline into two parts:
 - General description of the calculation;
 - Practical examples of calculation using pre-programmed spreadsheet tables for mandatory and selected supplementary nutrients for nutrition labelling;
- Peer review of the Guideline by EuroFIR AISBL experts prior to its publication;
- Adoption of EuroFIR recommendations by the target group – food business operators using the Guideline as a step-by-step guide to the calculation procedure;
- English as the main language of the Guideline with a possibility of translation into local languages;

- Free access to the Guideline on the EuroFIR web site (www.eurofir.org) and possibly on other relevant websites, e.g. websites providing national food composition databases.

The EuroFIR Recipe Guideline entitled “How to calculate Nutrient Content of Foods – a Guideline for Food Business Operators” is organised into two parts – Part I, A general description and Part II, Examples of calculations and was published on the EuroFIR web site (<http://www.eurofir.org/?p=5946>) in December 2015.

2.2. Comparison of calculated values with analysed values

The calculation method described by the Guideline was tested on a range of foods and the values calculated were compared with analysed values produced for the same products. In the practical part of the Guideline, checking of calculated values against analytical values and tolerances allowed by the EU guidance document on control of compliance (European Commission, 2012) are demonstrated for a Czech traditional food Bramborak. Analytical values of Bramborak were obtained by standardized methods as described by Holasova et al., 2008. The Bramborak recipe was obtained from the Czech recipe book for public catering services (Runstuk et al., 2004).

Nutrient contents of 36 food products available in the UK were calculated using the guideline method and were compared with values that were produced by direct analysis. Analytical values were produced by laboratories contracted by the product manufacturers and the analytical values were supplied to IFR in the form of product specification documents. The analytical values were all produced by accredited laboratories using standard analytical methods for each component, e.g. Kjeldahl or Dumas method for protein; mixed solvent extraction methods for total fat; polarimetry, HPLC or enzymatic colorimetric methods for carbohydrates; AOAC methods for dietary fibre; ICP-MS for sodium. The food products tested included: ice cream, sponge cake, sausage rolls, pasta products, cooked meat products, cereal based snack bars, granola, muesli, crispbread, savoury crackers and other savoury snacks.

3. Results and discussion

3.1. Content of the Guideline

Part I presents a general description of the EuroFIR harmonized calculation procedure arranged into ten steps (Table 1). An extra step for calculation of water content is also included, because even though water is not on the list of nutrients permitted for nutrition declaration it is an important parameter of a food. Calculation of

Table 1
Procedural steps for calculating nutrient content of recipes according to the EuroFIR Recipe Calculation Guideline.

Step	Procedure
1.	List of ingredients
2.	Weight of input ingredients
3.	Total raw weight of input ingredients
4.	Weight of cooked food
5.	Food composition data of input ingredients
6.	Calculation – content of nutrients in cooked food without retention factors
7.	Retention factors
8.	Calculation – content of nutrients in cooked food with retention factors
9.	Rounding of final values
10	Calculation of energy value
Additional step	Calculation of water

Download English Version:

<https://daneshyari.com/en/article/5132663>

Download Persian Version:

<https://daneshyari.com/article/5132663>

[Daneshyari.com](https://daneshyari.com)