

## ORIGINAL ARTICLE

# Capacity development in food composition database management and nutritional research and education in Central and Eastern European, Middle Eastern and North African countries

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**Background/Objectives:** Capacity development (CD) in food and nutrition is much more than formal training and includes human resource development, and organisational, institutional and legal framework development with the aim of enhancing nutrition-relevant knowledge and skills to support infrastructural development. The goal of the European Food Information Resource (EuroFIR) Network of Excellence has been to develop and integrate food composition data throughout Europe. EuroFIR joined forces in CD with the United Nations (UN) University and UN System Standing Committee on Nutrition, the Network for Capacity Development in Nutrition in Central and Eastern Europe, the Central and Eastern European Countries Food Data Systems network and with the Middle East and North African Capacity Building Initiative. The aim of this paper is to discuss an inventory of the status of food composition databases (FCDBs) and the training needs of compilers in non-EuroFIR countries in Central and Eastern Europe (CEE) and in the Middle East and North Africa (MENA), and to present the CD achieved through EuroFIR and other network collaborations.

**Subjects/Methods:** Two online questionnaires were created addressing the FCDB status and specific training needs in countries of the targeted regions. Data were collected during 2006–2008 and then analysed. Subsequently, CD activities were organised.

**Results:** Contacts were established in 19 CEE and 7 MENA countries, of which several had national food composition tables, but no electronic versions. Education, training, workshops, networking and the sharing of experiences were uniformly requested. Subsequently, CD activities in EuroFIR were organised focussing on food composition courses, exchange visits, workshops and individual training for PhD students, junior scientists and other staff categories, as well as conferences linked to food composition research and food information. To facilitate CD activities, EuroFIR has signed a Memorandum of Understanding with the Czech Republic, Hungary, Slovenia, Croatia and Estonia.

**Conclusions:** EuroFIR has created training activities that complement national activities. Collaboration with other networks has provided an overview of FCDB status and training needs, providing directions for CD activities in those countries. This provides a platform for new funding and further development and networking for CD, which would be conducive to European Commission objectives and public health strategies for CD.

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## Introduction

Capacity development (CD) in food and nutrition is more than formal training. It also includes human resource development, and organisational, institutional and legal framework development with the aim of enhancing

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knowledge and skills (Lopes and Theisoehn, 2003). CD is a long-term, continuous process, which focusses on national priorities, plans, policies and processes. The European Food Information Resource (EuroFIR) Network of Excellence ([www.eurofir.net](http://www.eurofir.net)) aims to develop and integrate food composition data throughout Europe. To achieve this goal, CD in food and nutrition is essential. EuroFIR joined forces in CD with the United Nations (UN) University (UNU)/UN System Standing Committee on Nutrition (SCN), the Network for Capacity Development in Nutrition in Central and Eastern Europe (NCDNCEE, <http://www.srbnutrition.info/?page=Network>) (Pavlović *et al.*, 2009a), the Central and Eastern European Countries Food Data Systems (CEEFOODS) network and with the Middle East and North African Capacity Building Initiative (MENA-NA). An inventory was carried out to assess the status of food composition databases (FCDBs) and the need for training and CD in these countries (Porubska *et al.*, 2007; Pavlović *et al.*, 2009b).

EuroFIR has developed various training tools for the production and use of food composition data, quality assurance (evaluation), compilation and retrieval (Hollman *et al.*, 2009). The EuroFIR training programme consists of individual activities, supported by exchange grants, and tailor-made courses and workshops that are offered to participants. Since 2007, these opportunities have been available to members of the EuroFIR Network and, to a limited extent, to partners from officially recognised compiler institutions who were not members of the EuroFIR network. CD networks were recognised as important tools for the future development of FCDBs in Central and Eastern European (CEE) countries (Hollman *et al.*, 2009; Pavlović *et al.*, 2009b). As a consequence, the EuroFIR network also wanted to address CD needs in Middle Eastern and North African (MENA) countries by joining forces with the MENANA.

To accomplish this, a study was conducted aiming to increase the number of contacts with non-EuroFIR compilers in MENA countries in order to complete an inventory of FCDB status and to identify specific training needs as a basis for CD activities. Collaborations with these countries would also provide profitable opportunities. Furthermore, it was considered important to support CD in order to enhance the process of creating national FCDBs in these countries by identifying their specific training needs and by developing specialised training programmes. The aim of this paper is to describe this process and document some of the courses that have been provided with regard to CD.

## Methods

At the beginning of the project, contacts were established between the EuroFIR and non-EuroFIR countries from the targeted regions, and an agreement was reached to assess existing FCDBs and also to organise CD activities for

countries outside EuroFIR. As a first step, a detailed investigation was conducted with regard to existing FCDBs, their status and information about organisations and capacity to conduct food composition compilation activities. This was carried out by means of two online questionnaires (Pavlović *et al.*, 2009b), which addressed FCDB status and specific training needs in non-EuroFIR countries in CEE and MENA countries. Several workshops were also organised, which brought together experts with direct experience in collecting and processing data for FCDBs. Data from the questionnaire were collected during 2006–2008 and subsequently analysed. Training needs were identified and information obtained on the professional capacity background of the countries. On the basis of the assessment, specialised training programmes, courses, individual training and workshops were developed and implemented to support CD, and the initiation or progress in national FCDB or food table production (Hollman *et al.*, 2009; Pavlović *et al.*, 2009b).

## Results

Training needs in food and nutrition in non-EuroFIR countries were identified. As shown in Table 1, a number of countries were involved in CD activities up until 2009. Contacts in the non-EuroFIR countries, as potential new partners of the EuroFIR network, were established. These countries included Albania, Armenia, Bosnia and Herzegovina, Croatia, the Czech Republic, Georgia, Hungary, Macedonia, Montenegro, Romania and Slovenia from the CEE region (Pavlović *et al.*, 2009b). MENA countries were also contacted, including Egypt, Jordan, Iran, Lebanon, Oman, Palestine and Sudan. Several countries did not have adequate information to respond to all questions of the online questionnaire (Pavlović *et al.*, 2008). None of the countries had electronic versions of FCDBs. Nine countries answered that they had national food composition tables, but there was a considerable need for additional equipment for nutrient analysis. Only two countries from the CEE region said that they were familiar with the steps required in establishing FCDBs. These results were a serious signal underpinning the need for more CD activities, either locally, regionally or internationally.

Formal education, training workshops, networking and experience sharing (all part of CD) were uniformly requested, and, as mentioned earlier, some of the activities were organised to meet those expressed needs. To support national FCDB development according to EuroFIR standards, EuroFIR has signed Memorandums of Understanding with several countries, including the Czech Republic, Hungary, Slovenia, Croatia and Estonia (Table 1). The CD activities included food composition courses; courses on production and use of food composition data; joint courses in capacity strengthening, and courses by EuroFIR, CEEFOODS and the Food and Agriculture Organization of the UN; the CD

**Table 1** Capacity development achievements through EuroFIR and other network collaborations, including EuroFIR training activities provided to non-EuroFIR countries from CEE, and MENA

Type of capacity development and training activity	Number of participants/countries
<i>Specialised EuroFIR courses</i>	
7th International Postgraduate Course on the Production and Use of Food Composition Data, Wageningen, the Netherlands, 31 October–16 November 2005	26 participants from 25 countries (14 from European countries, including 3 from CEE countries)
EuroFIR Course on Production of Food Composition Data in Nutrition, Bratislava, Slovakia, 16–8 October 2006	30 participants from 23 European countries (12 from CEE and from NCDNCEE non-EuroFIR countries)
8th International Graduate Course on Production and Use of Food Composition Data in Nutrition, Wageningen, the Netherlands, 1–3 October 2007	28 participants from 24 countries (14 from Europe including 2 from CEE countries)
EuroFIR course on Production and Use of Food Composition Data in Nutrition, Bratislava, Slovakia, 6–7 October 2008	25 participants from 18 countries (14 from Europe including 3 from CEE countries, 2 from MENA, 5 from non-EuroFIR CEE with MoU, 4 from other non-EuroFIR CEE countries)
9th International Graduate Course on Production and Use of Food Composition Data in Nutrition, Wageningen, the Netherlands, 11–24 October 2009	21 participants from 18 countries (10 from European countries, including 2 from CEE)
<i>Workshops, meetings</i>	
Joint EuroFIR/CEEFOODS/FAO food composition database workshop, Sofia, Bulgaria, 26–27 July 2005	Participants from 12 non-EuroFIR countries
Workshop on strengthening capacity in CEE countries, Bratislava, Slovakia, 28 October 2006	17 participants from 8 CEE non-EuroFIR countries
2nd UNU/SCN Network meeting for Capacity Development in Nutrition in Central and Eastern Europe, Budapest, Hungary, 16–17 November 2006	18 participants from 9 CEE non-EuroFIR
3rd UNU/SCN Network meeting for Capacity Development in Nutrition in Central and Eastern Europe, Belgrade, Serbia, 1–2 November 2007	22 participants from 10 CEE non-EuroFIR countries
EuroFIR workshop Training and Capacity Building for non-EuroFIR CEE Countries, Belgrade, Serbia, 5 June 2007	20 participants, 11 from CEE non-EuroFIR countries
4th UNU/SCN Network meeting for Capacity Development in Nutrition in Central and Eastern Europe, Belgrade, Serbia, 10–12 November 2008	31 participants from 15 CEE non-EuroFIR countries
BaSeFood Food Indexing Training Course, Belgrade, Serbia, 9–11 November 2009	25 participants, 4 from CEE non-EuroFIR countries
5th Meeting of the UNU/SCN Network for Capacity Development in Nutrition in Central and Eastern Europe, Belgrade, Serbia, 11–12 November, 2009	32 participants from 10 CEE non-EuroFIR countries
<i>EuroFIR has signed MoUs</i>	Czech Republic, Hungary, Slovenia, Croatia and Estonia
<i>Individual training grants for</i>	
Participation in 'Food indexing' course	3: Estonia, Georgia, Hungary
Training exchange visit 'Analysis of fat-soluble and B vitamins by HPLC'	1: Macedonia
Participation in course on 'Slovak FC technology and use of the Slovak data set'	2: Czech Republic
Participation at Australian/OCEANIA food composition course 2009	1: Philippines
Training exchange visit 'Assessment and development of a food folate database'	1: Spain
Training exchange visit 'Analysis of anthocyanins in food'	1: Macedonia
Training exchange visit 'Determination of fatty acids in oil and baby food'	1: Macedonia
Partial contribution to attendance of 3rd international EuroFIR Congress 2009	1: Egypt
<i>E-learning module for education in Food Composition Data</i>	Covering analysis of fat and fatty acids, carbohydrates and fibre, protein and amino acids, minerals and trace elements. The educational principles to achieve competence are based on: student motivation, authentic learning context, active learning and visualisation of important concepts and reduction of unnecessary cognitive load

Abbreviations: BaSeFood, sustainable exploitation of bioactive components from the Black Sea Area traditional foods; CEE, Central and Eastern Europe; CEEFOODS, Central and Eastern European Countries Food Data Systems; EuroFIR, European Food Information Resource; FAO, Food and Agriculture Organization of the United Nations; HPLC, high-performance liquid chromatography; MENA, Middle East and North Africa; MoU, Memorandum of Understanding; NCDNCEE, Network for Capacity Development in Nutrition in Central and Eastern Europe; UNU/SCN, United Nations University/Standing Committee on Nutrition.

network within the UNU/UN SCN system (Pavlović *et al.*, 2006, 2007; Gurinović *et al.* 2008, 2009); food indexing courses; and a course on analysis of specific nutrients (Table 1). Methods for nutrient analyses, food sampling, data quality and data evaluation, food nomenclature systems, database management and recipe calculations were identified as the main training needs in all countries. Since 2006, the training opportunities have been available to members of the EuroFIR network, as well as, gradually, to compiler institutions in non-EuroFIR member countries.

Following engagement with EuroFIR, many professionals from non-EuroFIR countries attended a EuroFIR Food Composition Course on Production and Use of Food Composition Data in Nutrition. A web application for the creation of new FCDBs has been presented at training sessions and has proved to be a useful training tool for the initiation of new FCDB creation and development, following EuroFIR criteria (Glihetić *et al.*, 2009). This web application tool created and used in Serbia was developed according to EuroFIR technical criteria, but it can be used in other European regions, including West Balkan countries (Gurinović *et al.*, 2009). An e-learning module for education in FCDBs (Hulshof *et al.*, 2009) is currently under evaluation before final preparation.

## Discussion

The results highlight both positive dimensions and weaknesses in the collaboration between the EuroFIR network and non-EuroFIR countries. Positive achievements include the ongoing CD in FCDBs in the CEE region, and more advanced systems in many countries. This was partly achieved through EuroFIR workshops, training activities and meetings. Another positive outcome was that, by linking various activities, such as within the UNU and CEE CD Network, many participants within this network could harvest benefits from EuroFIR CD activities and thus many of the training needs identified for those countries could be met. The situation regarding the development of FCDBs and related training in the MENA countries is more complex than that in the EuroFIR participating countries.

Despite many achievements, not all the training needs required by professionals in the targeted regions could be met, as many of the issues raised in non-EuroFIR countries were context-specific and would require resources beyond what was available within EuroFIR. Part of the reason for not achieving the goals is a lack of funding. However, the decision by EuroFIR to support CD in non-EuroFIR countries was highly appreciated.

The context-specific needs for CD seem to be high in the MENA area; this is of significant importance for the development of FCDBs in the entire region, and the opportunities for further CD seem to be considerable. The existence of information for local produce and traditional food/dishes must be taken into account. However, CD is a

long-term process for which national or regional funding is needed. The training itself must be a continuous professional activity. With programmes such as EuroFIR, much can be achieved in CD in the entire European region and beyond. Collaboration between EuroFIR and other networks has provided an excellent overview of the current status of FCDBs and linked training needs, and thus pointed towards the need for future CD in FCDBs.

During the 5th Meeting of the UNU/SCN NCDNCEE in Belgrade in November 2009, a new initiative emerged with the aim of creating a regional FCDB specific for the Balkan region using the FCDB web application tool (Gurinović *et al.*, 2009).

The cooperation between EC-funded projects and networks will contribute to FCDB research and development and will become a platform for further networking opportunities; it will initiate new funding and long-term sustainability, and will contribute to European research.

CD activities are in line with the objectives for research and CD in food and nutrition for better public health, set by the European Commission and the World Health Organization (WHO). The WHO's Second European Action Plan for Food and Nutrition Policy 2007–2012 (WHO, 2008) aims to combat micronutrient deficiency and promote healthy eating. Food labelling and monitoring of food and nutrient intake are important tools to reach the overall aim, and therefore CD in FCDB development has a major role within this food and nutrition action plan.

## Conclusions

Collaboration between the EuroFIR Network of Excellence and other networks (NCDNCEE, CEEFOODS and MENANA) has provided excellent opportunities for CD in FCDB creation, use and maintenance. The EuroFIR network has thus created CD activities that complement national activities. Trainees reported training activities to have been successful, with respect to reaching both individual/national aims and EuroFIR goals. CD networks can be useful tools in addressing needs in various countries and in streamlining regional involvement and collaboration, and can increase capacity to address food, health and nutritional challenges, including FCDB development.

## Conflict of interest

The authors declare no conflict of interest.

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