



## Review

## European food-based dietary guidelines: A comparison and update



Concetta Montagnese B.Sc., Ph.D.<sup>a,b,\*</sup>, Lidia Santarpia M.D., Ph.D.<sup>a</sup>,  
 Margherita Buonifacio Dietitian<sup>a</sup>, Arturo Nardelli Dietitian<sup>a</sup>,  
 Anna Rita Caldara Senior Dietitian<sup>a</sup>, Eufemia Silvestri Senior Dietitian<sup>a</sup>,  
 Franco Contaldo M.D.<sup>a</sup>, Fabrizio Pasanisi M.D., Ph.D.<sup>a</sup>

<sup>a</sup> Interuniversity Center for Obesity and Eating Disorders, Department of Clinical Medicine and Surgery, Federico II University, Naples, Italy

<sup>b</sup> CEINGE Biotecnologie Avanzate, Naples, Italy

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## ABSTRACT

**Objectives:** The aim of this study was to review and update information about food-based dietary guidelines (FBDGs) used by European countries.

**Methods:** FBDGs from 34 European countries were collected and their pictorial representations, food groupings, and associated messages of healthy eating and behavior were compared.

**Results:** FBDGs from 34 European countries were collected, representing 64% (34 of 53) of all European countries; 74% (28 of 34) are European Union members. Of these FBDGs, 67% (23 of 34) adopt the pyramid as a food guide illustration, and classify foods into five or six groups. The main food groups are grains, vegetables, fruits, and vegetables and fruits as a unified group. Some differences include the modality of food classification. Despite dietary pattern results from geographic conditions and cultural (ethnic) heritages, most nutritional key points are similar among the different European FBDGs. In particular, the basic message is to consume adequate amounts of grains, vegetables, and fruits with moderate intake of fats, sugars, meats, caloric beverages, and salt. Other healthy behaviors are frequently but not always indicated.

**Conclusions:** FBDGs still seem insufficient as far as ethnic peculiarities, agreement on how to group foods, and subgroup population nutritional requirements.

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## Introduction

Food and nutrition play a key role in the prevention and treatment of some of the most common chronic non-communicable diseases (NCDs) such as obesity, cardiovascular disease (CVD), diabetes, and some types of cancer. It is well known that these diseases derive, at least in part, from an excessive intake of some nutrients and a shortage of others, in particular of certain micronutrients [1,2]. Consumers often are confused by the information and advice continuously offered by different sources on nutrition and healthy lifestyles and sometimes even by the details on food labels about composition in

nutrients (carbohydrates, fat, protein, vitamins, and minerals). In order to spread simple and understandable nutritional information, scientific societies such as the Food and Agricultural Organization (FAO) and the World Health Organization (WHO) have produced and updated food-based dietary guidelines (FBDGs) since 1996 [3–5]. FBDGs were conceived to provide general indications of what a population should eat in terms of foods rather than of nutrients. They are written in an easy-to-understand language with illustrations, and address public health concerns, such as chronic NCDs, by providing a basic framework for use when planning meals or daily menus, to achieve a healthy balanced diet.

The aim of this study was to collect all the available national FBDGs from European countries identified according to WHO European-Member-States classification. The collected FBDGs were compared according to their pictorial representation, message on healthy eating, variety of food grouping (including

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\* Corresponding author. Tel.: +39 081 373 7887; fax: +39 081 373 7808.

E-mail address: [montagnese@ceinge.unina.it](mailto:montagnese@ceinge.unina.it) (C. Montagnese).

beverages), and eventually the recommended quantities for each food group. Finally, other healthy lifestyle suggestions were considered.

## Materials and methods

FBDGs from European countries identified according to the WHO European-Member-States classification and divided into eight geographic subregions to facilitate comparative analysis were collected (Appendix A). Sources of information were the Internet, the FAO website, embassies, and National Ministries of Health. Countries with <100 000 inhabitants (WHO website, 2012) were excluded. Data concerned the format of the FBDGs, additional texts such as leaflets, booklets providing further information and advice on the types and quantities to be consumed for each food group, as well as additional tips that also could include fluids, alcohol, physical activity, and body weight advice as well as individual healthy behaviors. After collecting data, FBDGs were compared according to graphic patterns, foods pictured, and food grouping composition. Other specific integrative recommendations on the type of beverage consumed, salt intake, healthy lifestyle (physical activity), and other healthy behavior items were also considered.

## Results

WHO identifies 53 European countries, divided into eight geographic subregions; 28 countries are federated as the European Union (EU) for a total population of 904,168,000. Official FBDGs, such as any supportive dietary-related information, were requested from the 53 European countries. Andorra, Monaco, and San Marino states were excluded from the analysis due to a population rate <100 000 inhabitants. We were unable to obtain official data from 16 countries, most of which did not belong to the EU (Appendix A). Therefore, final data analysis regarded 34 European countries for a total of 746,440,000 European citizens (83% of the entire European population according to WHO criteria).

### Geographic distribution of studied countries

Data from all western, northern, southern and eastern European (Slovakia excluded) and Baltic country subregions were collected (Appendix A). No subregion data were available for countries of the Central Asian Republics; few data were obtained from southeastern European countries (data available only for Albania, Croatia, and Slovenia) and Commonwealth of Independent States (only Russian Federation). In conclusion, data on 64% (34 of 53) of European countries food guides were available; for 32 countries, information was exhaustive (as FBDG formats and various supportive information: Web pages, leaflets, and booklets). For Lithuania, no graphics were obtained, whereas for the Moldavian Republic only a graphical representation was available.

### EU countries

Twenty-eight of 34 (82%) European countries recruited in the study were official members of the EU. We obtained complete data for 26 of them. We were unable to obtain official information for Cyprus (southern Europe) and Slovakia (central-eastern Europe), the two remaining states members of the EU.

### Languages

Sixteen of the 34 countries had data and supportive information (Web pages, leaflets, and booklets) both in English and in the local language, whereas data were available only in the local language for the remaining 17 countries. Finally, Swiss FBDGs

were available both in the local German language and in Italian, due to the different regional cultural settings.

### Food guide illustration shapes

As far as shapes of food guide illustrations (Table 1), most European countries (97%) had a visual aid with exception of Lithuania, which lacked a FBDGs graphical representation.

The pyramid was the most frequently (67%) adopted food guide illustration. Foods representing the largest portions of a recommended healthy diet are at the base of the pyramid, whereas foods to be eaten more sparingly are at the top.

Germany uses a three-dimensional food pyramid that combines quantitative advice (nutrition circle) with qualitative advice on food consumption in a single model (Fig. 1A). The four faces of the pyramid provide a qualitative classification of food primarily based on energy density and nutrient content, as well as other nutritional physiological criteria: foods of plant origin, foods of animal origin, dietary fats and oils, and beverages. Colors on the left side of the pyramid indicate the nutritional value of foods and give advice on the amount to be consumed. The base of the three-dimensional food pyramid is the Deutsche Gesellschaft für Ernährung (DGE; German Nutrition Society) nutrition circle in which the size of each segment is a measure of the quantity of food in the daily plan [6,7]. Plant-based foods, milk, and dairy products occupy a much larger proportion of the circle than other animal-based foods. Fats are reduced to a very small proportion of the whole and water fills the center.

Eight of the 33 (24%) countries used a circle as a food guide pictorial representation. The circle is divided into different sections, each representing a food group; the area of the food section is proportional to the recommended amount. The Swedish circle (Fig. 1B), despite emphasis on cereals consumption, is divided in equal sections: Consequently no information on the recommended quantity for each food group is present.

**Table 1**  
Food guide shapes used in European FBDGs

Pyramid (n = 22)	Circle (n = 7)	Others* (n = 3)	No food guide graphic (n = 1)
Albania	Denmark	France	Lithuania
Austria	Iceland	Hungary	
Belgium	The Netherlands	Turkey	
Bulgaria	Norway		
Croatia	Portugal		
Czech Republic	Sweden		
Estonia	United Kingdom		
Germany†			
Greece			
Ireland			
Israel			
Italy			
Latvia			
Luxembourg			
Malta			
Moldovan Republic			
Poland			
Romania			
Russian Federation			
Slovenia			
Spain			
Switzerland			

FBDG, food-based dietary guideline

\* Other food guide forms included the house for Hungary, four-leaf clover for Turkey, and stairs for France.

† Germany is defined as a three-dimensional pyramid even if it combines circle and pyramid models.

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