

The DAFNE databank as a simple tool for nutrition policy

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Abstract

Objective: To identify, quantify and depict variation of food habits in Europe, using data from the DAFNE (Data Food NETWORKing) databank.

Setting: Household budget survey data of 12 European countries, namely Belgium, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain and the United Kingdom, around 1990.

Results: Data from the DAFNE databank are presented in simple pictorial presentations, which reveal considerable disparities in food habits. Furthermore, there appears to be nutritional variation within countries by socio-demographic groups, defined by their residence and educational level. The distribution patterns of food availability provide insights into the determinants of food preferences, as conditioned by current forces.

Conclusion: The factors influencing consumer choice are many and varied. Thus, in order to promote healthy eating, it is essential to identify the food habits of the target population. In this context, information derived from household budget surveys, used in the development of the DAFNE databank, could be very important.

Keywords
Household budget surveys
Food habits
Europe
The DAFNE data

Dietary patterns and nutritional intakes vary across Europe and within countries. This variability reflects the multitude of cultural, economic, geographic and psychosocial factors that can influence food behaviour. There is, however, increasing recognition that a comprehensive nutrition policy and action plan at the European level^{1–3} could facilitate national and regional policies.

The DAFNE (Data Food NETWORKing) databank may serve as a tool for identifying, quantifying and depicting variation of food habits in Europe⁴. The DAFNE data, presented in a simple pictorial form in this paper, document food habits in 12 European countries around 1990. These countries are: Belgium, Germany,[‡] Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain and the United Kingdom. Data from three additional countries (Croatia, France and Malta) are currently incorporated in the DAFNE databank. Considerable disparities are evident. Furthermore, there appears to be nutritional variation within countries by socio-demographic groups, defined by their residence and educational level. The distribution patterns of food availability provide insights into the socio-economic determinants of food preferences, as conditioned by market forces.

Methodology

From the food information available in the DAFNE databank, we have chosen to present and comment on 11 principal food groups, namely: meat and meat products, total added lipids, vegetable oils, vegetable fats including margarine, added lipids of animal origin, fresh vegetables, processed vegetables, fresh fruit, processed fruit, milk and cheese. For the nine countries that routinely collect this information, the daily individual availability of meat and meat products and total vegetables is further presented according to the educational level of household head. Finally, in an attempt to demonstrate food disparities by geographical region within country, the daily individual availability of meat and meat products, total vegetables and total fruits is presented for 13 Greek geographical districts. Methodological details and evidence supporting the validity of the DAFNE data have been presented elsewhere^{5,6}. The DAFNE databank is integrated in a software program, DafneSoft, which is accessible on the Internet at www.nut.uoa.gr.

Results

Figure 1 presents the availability of *meat and meat products*. In Hungary, Poland and Luxembourg meat availability exceeds 180 g person⁻¹ day⁻¹, while in

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‡Data refer to the former West Germany.

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Norway, Ireland and the United Kingdom it is around 130 g person⁻¹ day⁻¹. It is worth noting that the Mediterranean countries, in contrast to the past, have become important meat consumers. The availability of different meat types varies among the participating countries. For example, while Greeks seem to prefer beef, Spaniards show a preference towards poultry and processed meat.

Total added lipids (Fig. 2) cover both oils, generally of vegetable origin, and solid or semi-solid fat, either from animal sources or following industrial processing mainly of vegetable oils (margarine). The distinction between the terms 'fat' and 'lipid' is particularly important for the olive-oil-consuming countries. Although olive oil is included in the total lipids, it is not a fat, because this term implies saturated fat. Total added lipid availability varies from 75 g person⁻¹ day⁻¹ in Italy to 32 g person⁻¹ day⁻¹ in the UK. When the type of lipid is examined, however, *butter and animal fat* (Fig. 3) account for less than 10% of the total added lipid availability in the Mediterranean countries, while they exceed 30% in the majority of Northern and Central European countries.

Concerning *margarine* (Fig. 4), its availability rises to 75% of total added lipids in Norway; the lowest value of 3% appears in Italy and Spain. In the Mediterranean countries, in general, *vegetable oils* (Fig. 5) represent the lipid of preference, with 62% of the vegetable oil availability in Italy and 83% of this availability in Greece concerning olive oil.

With respect to *fresh* (Fig. 6) and *processed* (Fig. 7) *vegetables*, Greece is leading with a total availability of 229 g person⁻¹ day⁻¹ whereas Norway is trailing with a total availability of 102 g person⁻¹ day⁻¹. Interestingly, Poland and Hungary surpass Portugal and Spain, but this may be attributed to the popularity in consuming home-made pickled vegetables among Eastern European populations. The proportion of vegetables consumed fresh varies between countries, from 58% in Germany to 97% in Portugal.

With respect to *fresh* (Fig. 8) and *processed* (Fig. 9) *fruits*, Spain leads with total availability of 308 g person⁻¹ day⁻¹ whereas Ireland and Poland are at the lower end. Again, fruits are mainly consumed fresh in the Mediterranean countries. In Ireland, the availability of fruit barely exceeds 100 g person⁻¹ day⁻¹, with 79% of total fruits being purchased fresh.

An interesting pattern is evident with respect to dairy products: countries consuming relatively lower quantities of *milk* (Fig. 10), like Belgium (153 ml person⁻¹ day⁻¹) and Greece (190 ml person⁻¹ day⁻¹), tend to consume relatively higher quantities of *cheese* (41 g person⁻¹ day⁻¹ and 45 g person⁻¹ day⁻¹ for Belgium and Greece, respectively) (Fig. 11). The highest milk availability was noted in Ireland, where the consumption of cheese is rather low.

Figures 12 and 13 present availability data by the

educational status of the household head for meat and meat products (Fig. 12) and total vegetables (Fig. 13). With respect to meat and meat products, there is a tendency for lower consumption among the more educated households. With respect to total vegetables no consistent pattern emerges but, if anything, households of lower education tend to purchase higher quantities.

Apart from the educational level of the household head, food availability in the DAFNE countries has been studied according to the degree of urbanisation of the permanent residence (household locality). These data can be accessed through the DafneSoft program. When studying total added lipid availability according to household locality, a general trend is noticed: the availability of added lipids decreases as one moves from the rural to the urban areas. This also applies to the availability of vegetable oils. Norway is an exception, because vegetable oil availability increases in urban areas, whereas the opposite is true for total added lipids. This pattern could be interpreted in terms of easier access to information on health issues and current nutrition advice among urban populations. Thus, people living in urban areas tend to lower the overall consumption of lipids, while increasing consumption of vegetable oils.

Figures 14–16 present regional distribution of meat, vegetable and fruit availability in Greece. These figures document the flexibility of the DafneSoft program, but they also indicate that the population of Greater Athens, much as the urban population of Norway, tends to adhere more closely to current nutritional guidelines that stress reduced consumption of meat and increased consumption of vegetables and fruits. Crete, the cradle of the Mediterranean diet, is characterised by high availability of fruit and vegetables, to which, however, high consumption of meat and meat products has recently been added.

Discussion

Pictorial presentations are important because they help busy decision-makers to conceptualise the issues and reach rational decisions. Scientists, on the other hand, can use pictorial presentations in order to generate hypotheses concerning the determinants and the consequences of dietary patterns.

The results presented confirm that considerable variation exists between European countries. It is therefore no surprise that different countries have developed different strategies to promote healthy nutrition, since disease rates, eating patterns and food cultures vary from one country to another.

The factors influencing consumer choice are many and varied. Thus it is naïve to assume that in order to promote healthy eating it is sufficient to tell consumers what constitutes a healthy diet. An effective strategy to improve nutritional health must address a wide range of conceptions,

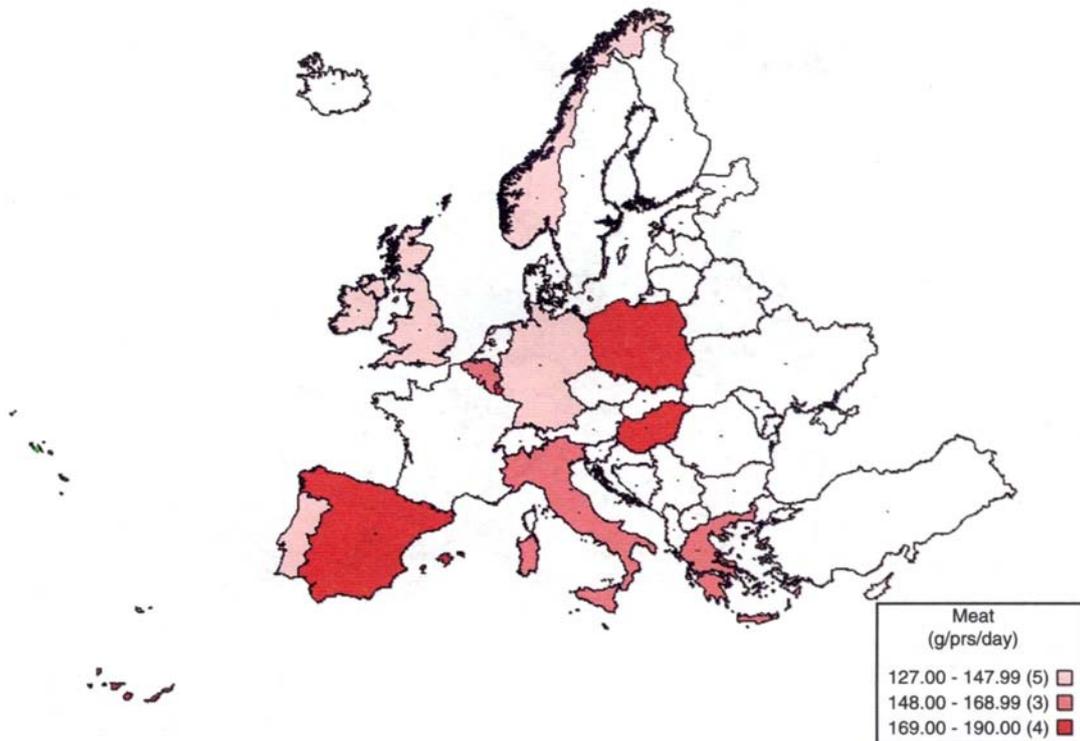


Fig. 1 Availability of meat and meat products, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

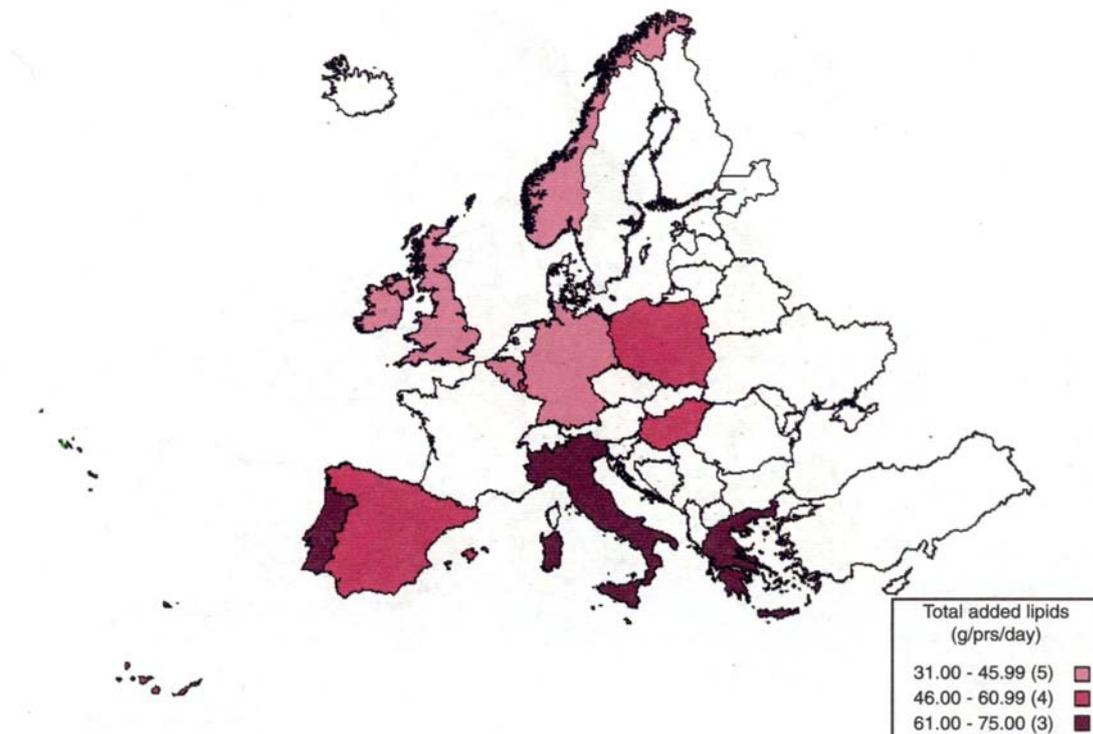


Fig. 2 Availability of total added lipids, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

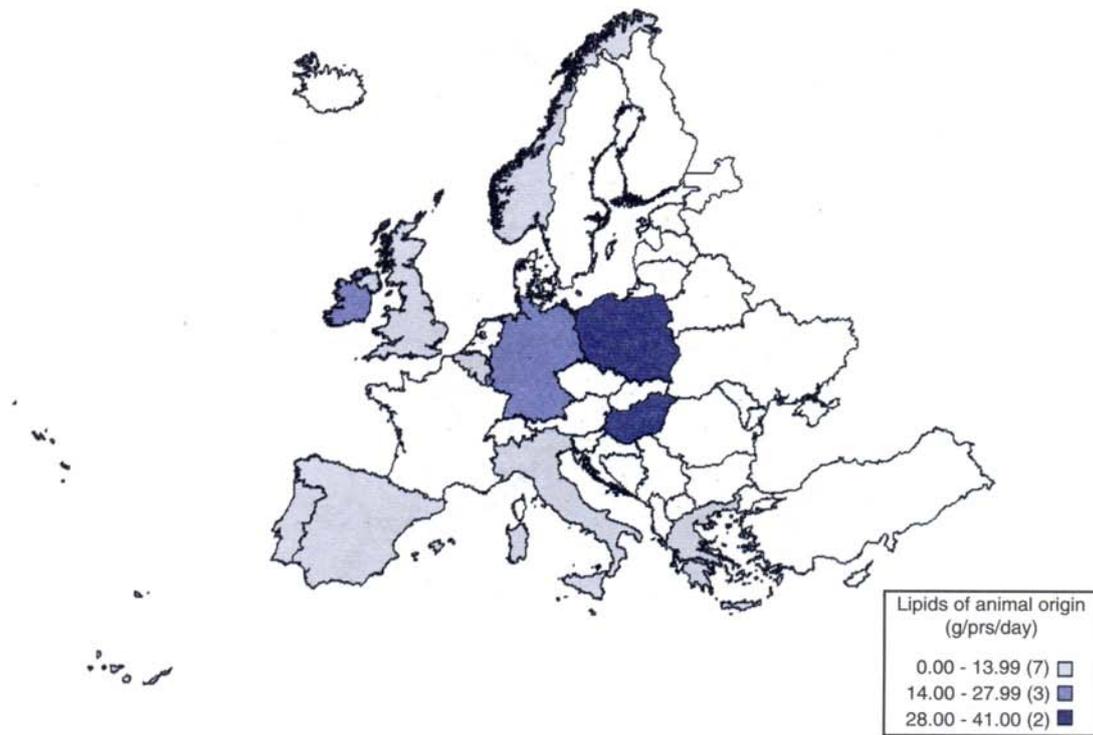


Fig. 3 Availability of added lipids of animal origin, in 12 DAFNE countries, around 1990 ($\text{g person}^{-1} \text{ day}^{-1}$)

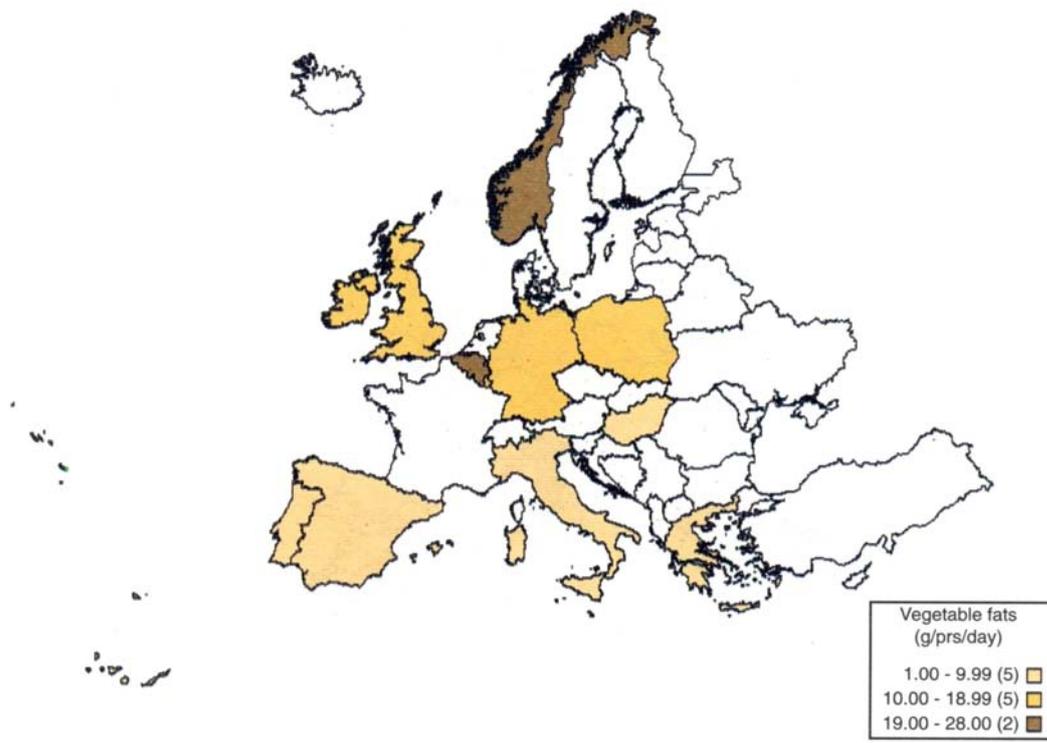


Fig. 4 Availability of vegetable fats (margarine included), in 12 DAFNE countries, around 1990 ($\text{g person}^{-1} \text{ day}^{-1}$)

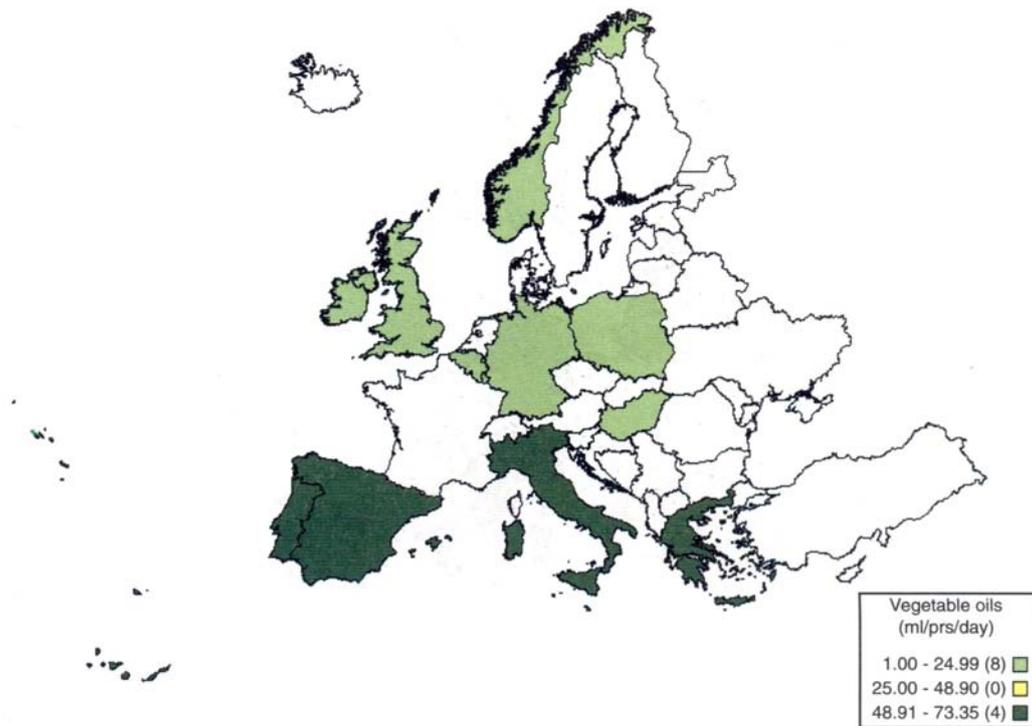


Fig. 5 Availability of vegetable oils, in 12 DAFNE countries, around 1990 (ml person⁻¹ day⁻¹)

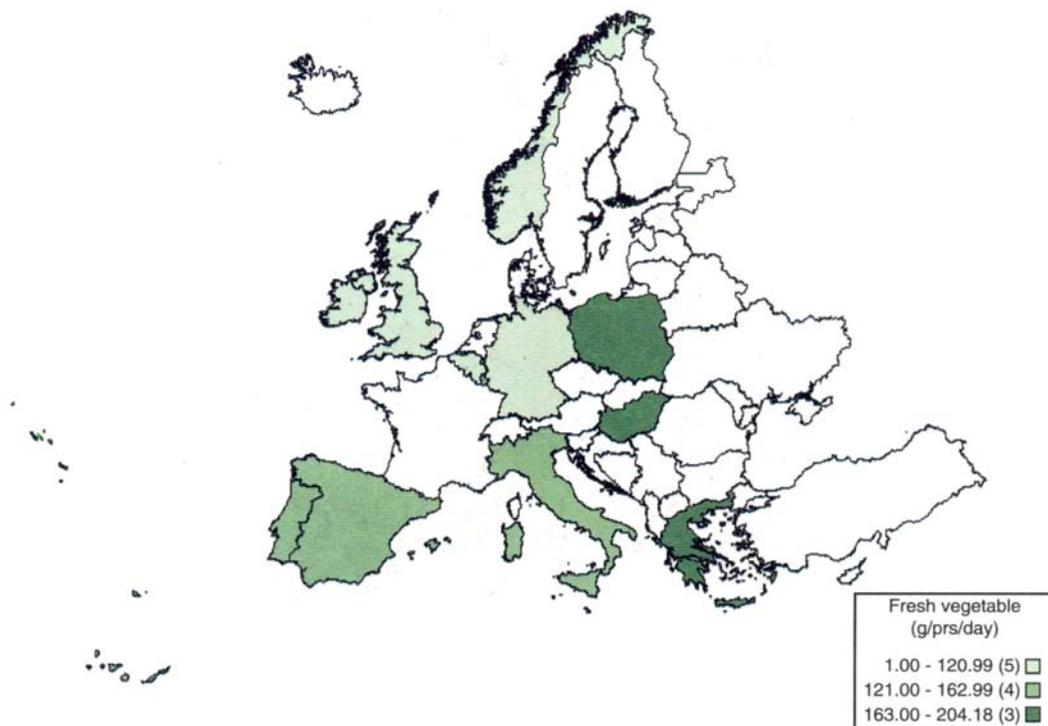


Fig. 6 Availability of fresh vegetables, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

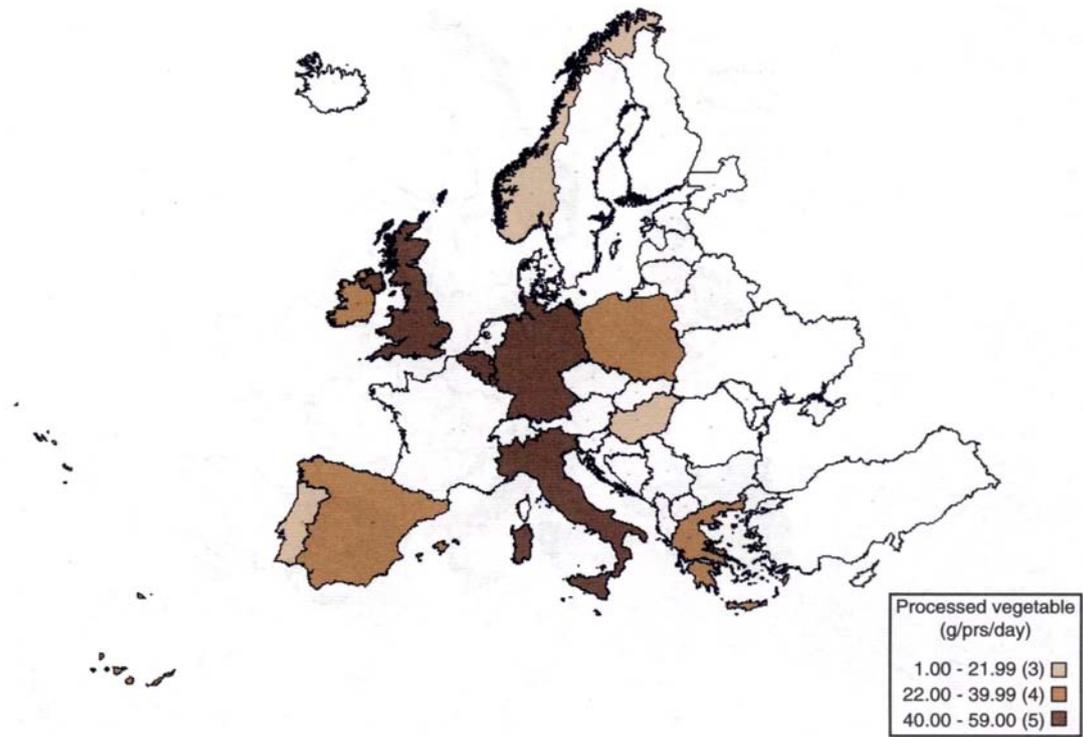


Fig. 7 Availability of processed vegetables, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

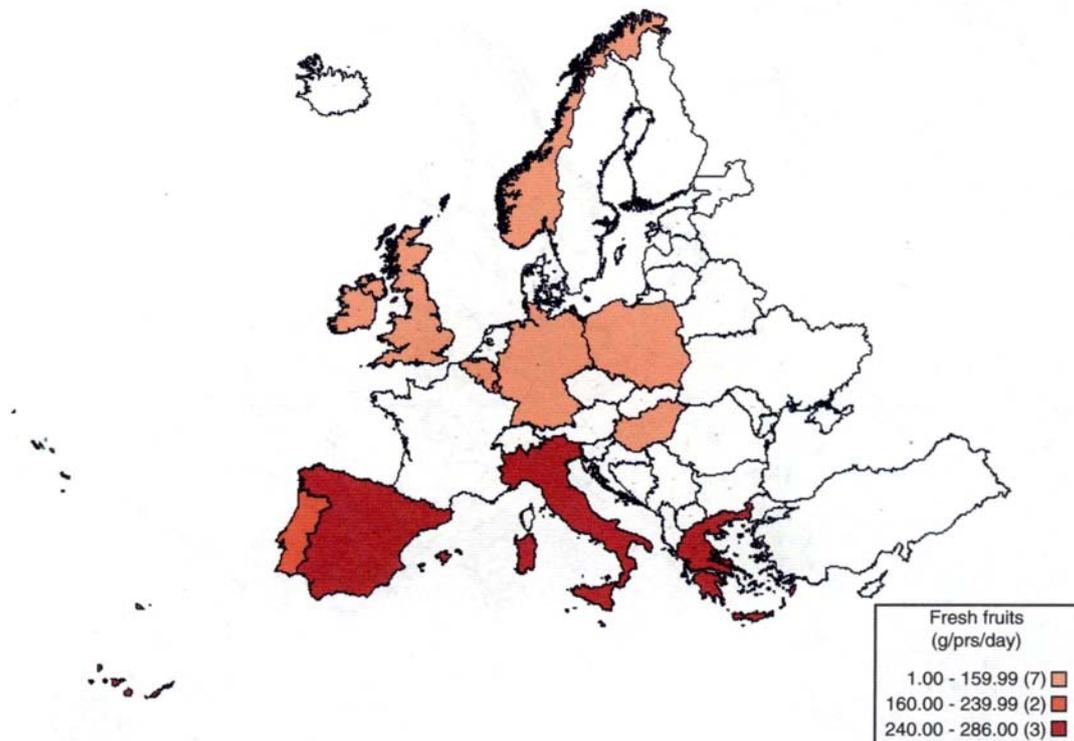


Fig. 8 Availability of fresh fruit, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

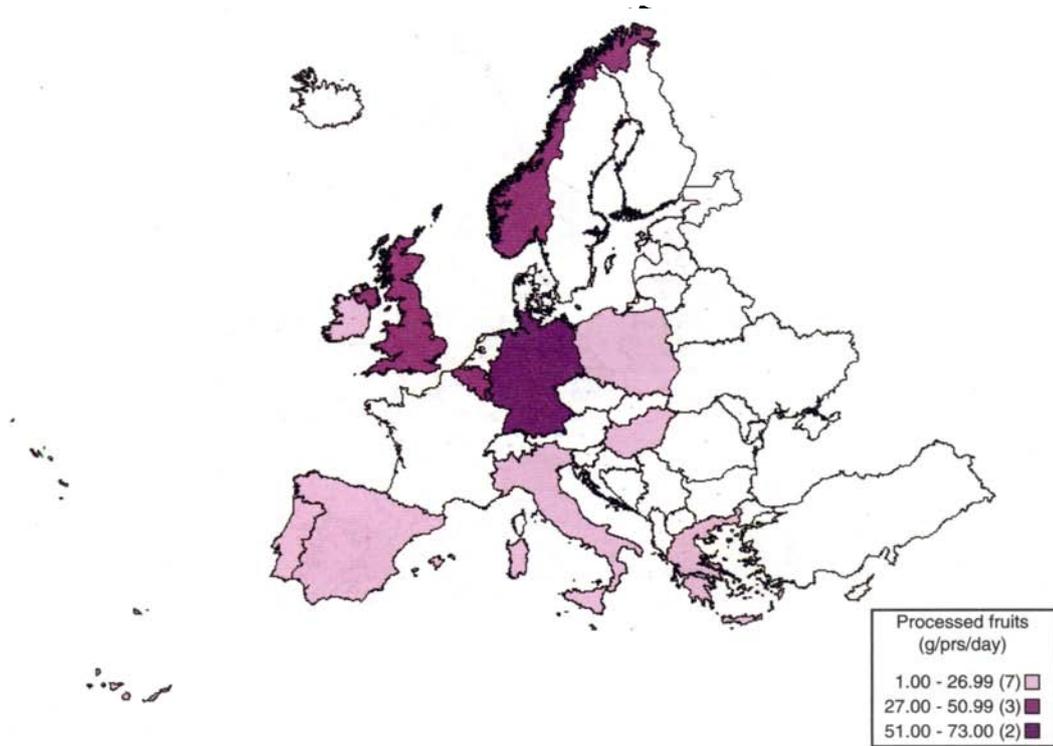


Fig. 9 Availability of processed fruit, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

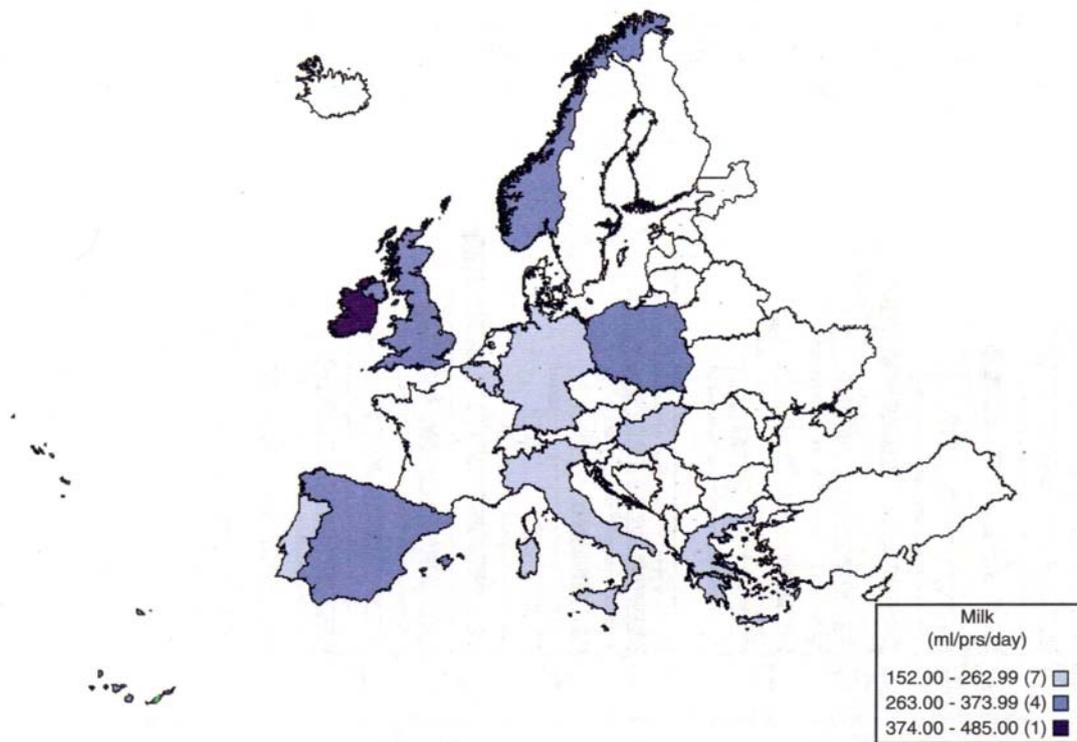


Fig. 10 Availability of milk, in 12 DAFNE countries, around 1990 (ml person⁻¹ day⁻¹)

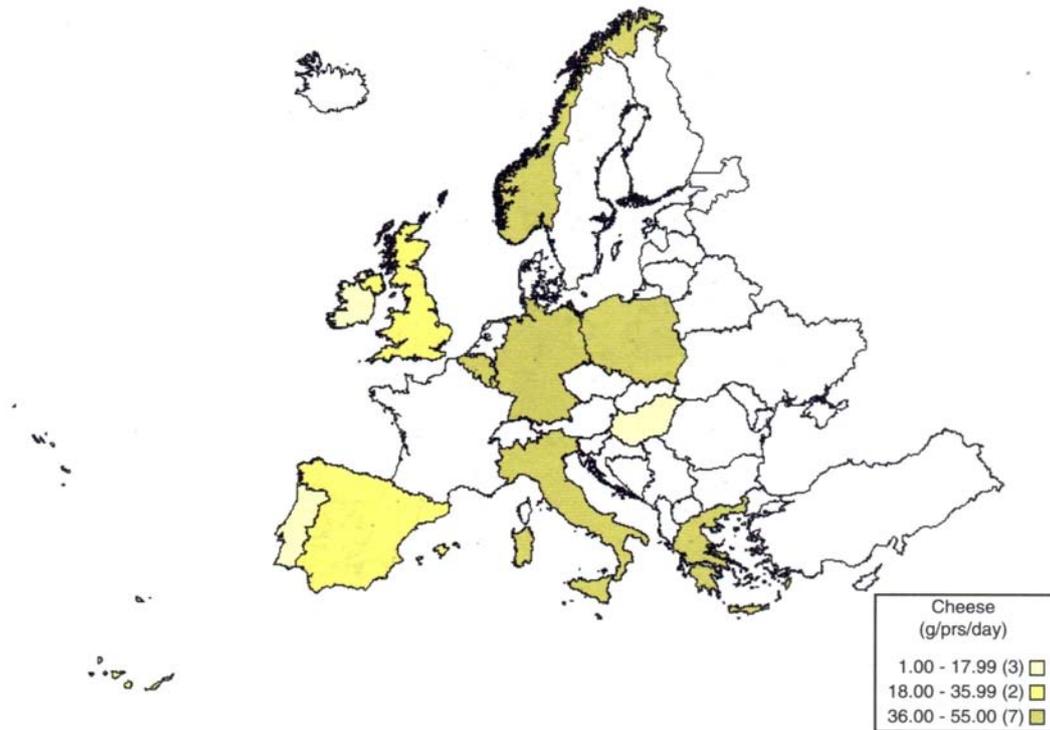


Fig. 11 Availability of cheese, in 12 DAFNE countries, around 1990 (g person⁻¹ day⁻¹)

misconceptions and perceptions, concerning diet and its effects on health and disease⁷.

Many national governments have taken action to improve nutrition as part of their public health policies. Clearly national governments are in the best position to devise strategies to tackle their own problems and conditions. Nevertheless, general suggestions have

universal applicability since the physiology of a Norwegian, for example, is not very different from the physiology of a Greek with respect to diet-related health responses. Based on these general principles, European food-based dietary guidelines could be developed. Regularly updated data on the food habits of the particular populations are of course crucial. In this context, individual nutrition surveys

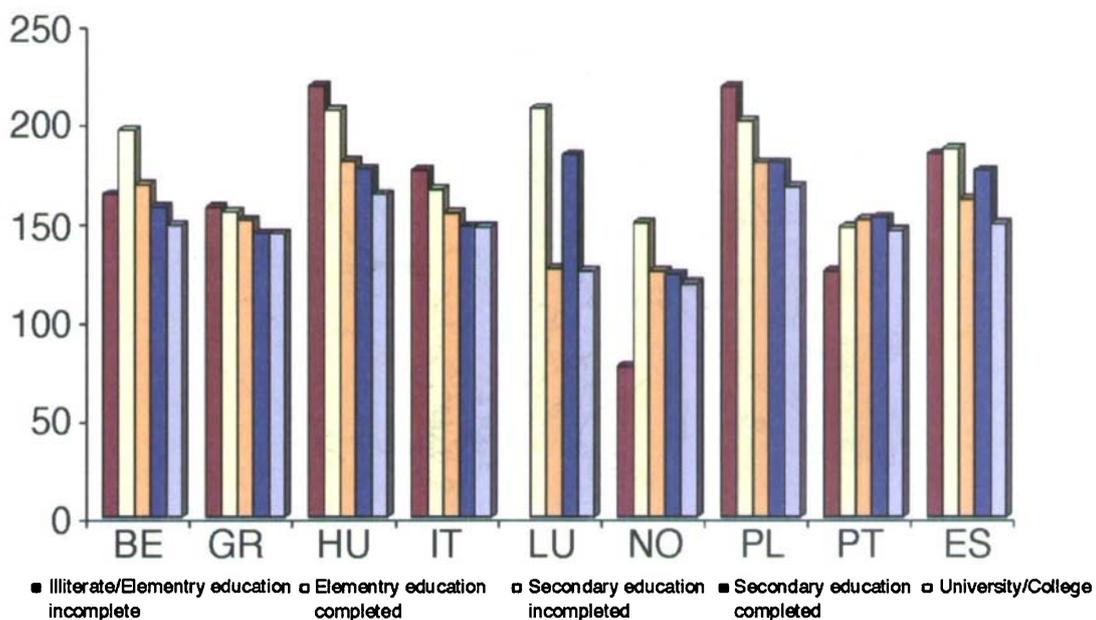


Fig. 12 Average availability of meat and meat products by educational level of household head, around 1990 (g person⁻¹ day⁻¹)

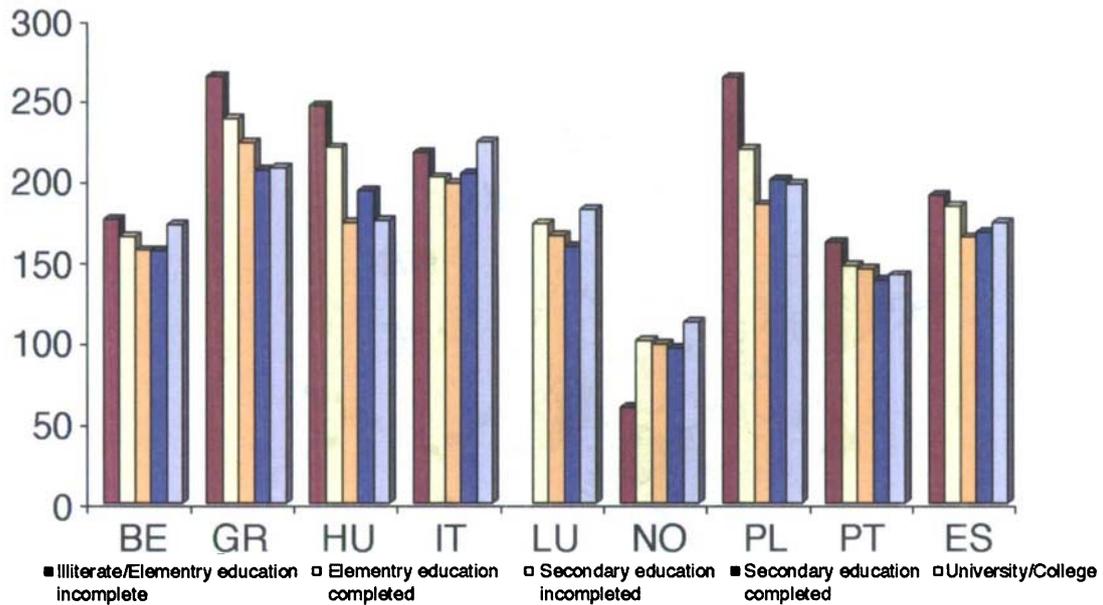


Fig. 13 Average vegetable availability by educational level of household head, around 1990 (g person⁻¹ day⁻¹)

or information derived from household budget surveys, and used in the development of the DAFNE databank, could be very important.

Notification

The German HBS data used in the DAFNE project

(German contract database) do not necessarily correspond to the non-anonymised statistical microdata from which the contract database was prepared.

The British HBS data are Crown copyright. They were made available by the Office for National Statistics (ONS) through the Data Archive, based in the University of Essex. Neither the ONS nor the Data Archive bears any

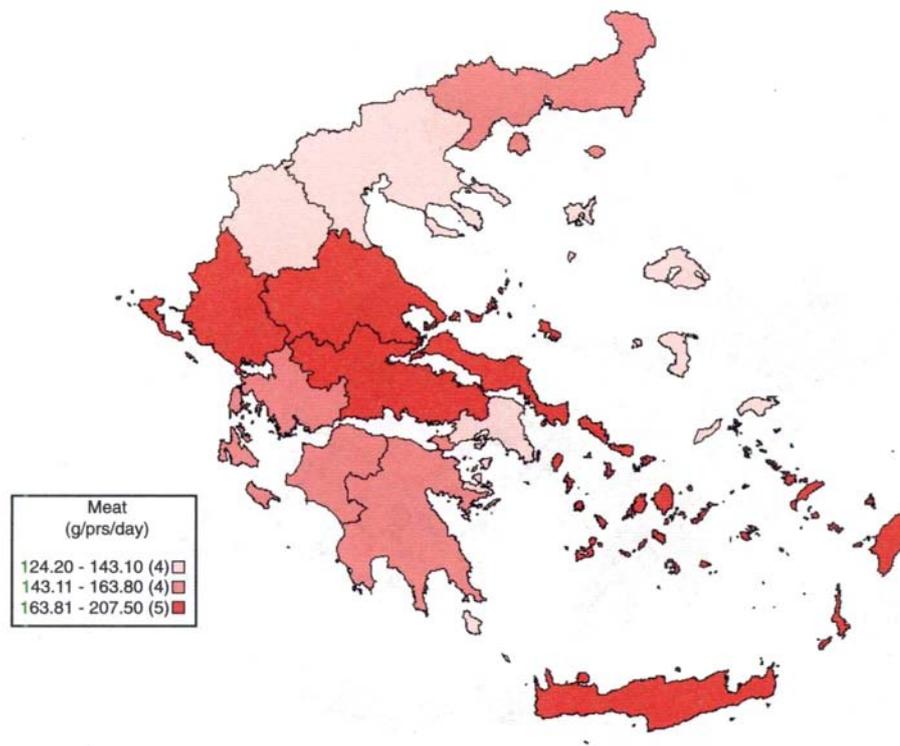


Fig. 14 Availability of meat and meat products in 13 Greek geographical districts, in 1994 (g person⁻¹ day⁻¹)

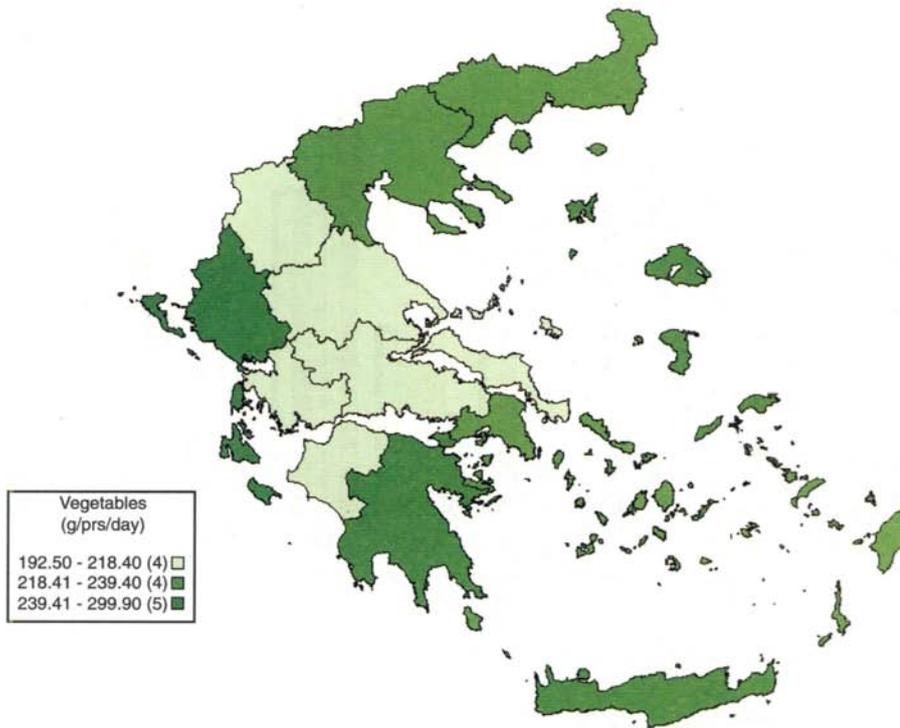


Fig. 15 Availability of vegetables in 13 Greek geographical districts, in 1994 ($\text{g person}^{-1} \text{ day}^{-1}$)

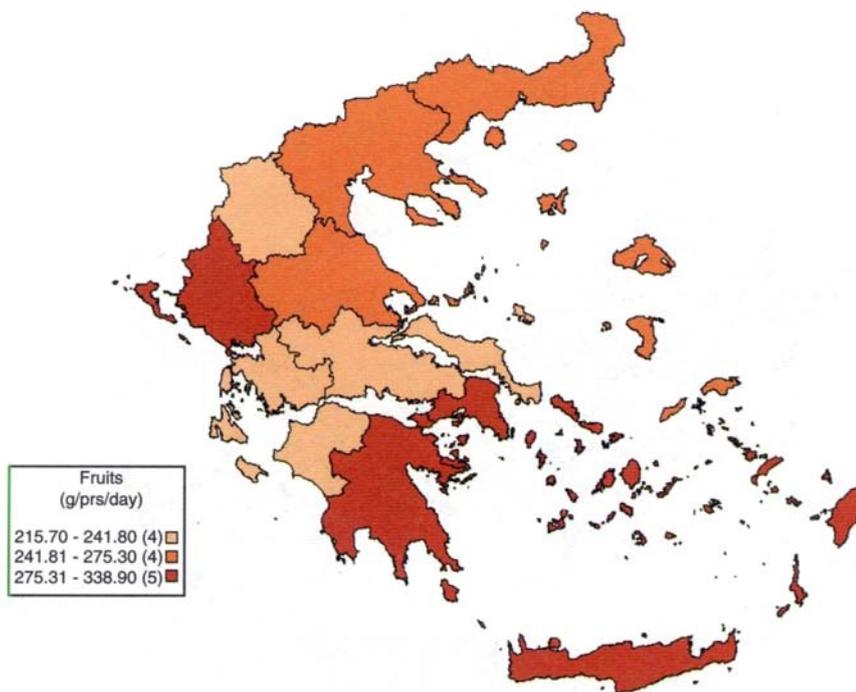


Fig. 16 Availability of fruit in 13 Greek geographical districts, in 1994 ($\text{g person}^{-1} \text{ day}^{-1}$)

responsibility for the analysis or interpretation of the data reported here.

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References

- 1 Société Française de Santé Publique. *Health and Human Nutrition: Element for European Action*. Collection Santé et Société No. 10. Nancy: Société Française de Santé Publique, 2000.
- 2 World Health Organisation, Regional Office for Europe. *Nutrition and Food Security Programme. Intersectoral Food and Nutrition Policy Development. A Manual for Decision Makers*. EUR/5026035. Copenhagen: WHO, 2001.
- 3 Kafatos AG, Codrington CA. Eurodiet Reports and Proceedings [special issue]. *Public Health Nutr.* 2001; 4(1A): 265–436.
- 4 Trichopoulou A, Lagiou P, Nelson M, Remaut-De Winter AM, Kelleher C, Leonhauser IU, Moreiras O, Schmitt A, Sekula W, Trygg K, Zajkas G, for the DAFNE I and II projects of the European Commission. Food disparities in 10 European countries: their detection using Household Budget Survey data – The DATA Food NETWORKING (DAFNE) initiative. *Nutrition Today* 1999; 34(3): 129–39.
- 5 Lagiou P, Trichopoulou A and the DAFNE contributors. The DAFNE initiative: the methodology for assessing dietary patterns across Europe using household budget survey data. *Public Health Nutr.* 2001; 4: 1133–9.
- 6 Naska A, Vasdekis VGS, Trichopoulou A. A preliminary assessment of the use of household budget survey data for the prediction of individual food consumption. *Public Health Nutr.* 2001; 4: 1157–63.
- 7 Lagiou P, Trichopoulou A, Henderickx HK, Kelleher C, Leonhauser IU, Moreiras O, Nelson M, Schmitt A, Sekula W, Trygg K, Zajkas G, for the DAFNE I and II projects of the European Commission. Household budget survey nutritional data in relation to mortality from coronary heart disease, colorectal cancer and female breast cancer in European countries. *Data Food Networking. Eur. J. Clin. Nutr.* 1999; 53: 328–32.

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