



# ANEMOS

Expansion and update  
of existing nutrition  
monitoring systems





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of existing nutrition  
monitoring systems

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## INTRODUCTION

The assessment and monitoring of dietary habits are important due to their possible association to the populations' health and wellbeing. In order to identify and evaluate time trends in food and nutrient patterns from a given population it is essential to have reliable, comparable and updated data. Such information is fundamental to construct effective nutritional interventions and to implement realistic policies.

A possible source of data for assessing and monitoring a nation's food and nutritional situation are the Household Budget Surveys (HBSs). The HBSs are undertaken using harmonized methodologies in all European countries and the collected data are nationally representative and updated on a regular basis. The HBSs data can be studied taking into account household characteristics, such as the degree of urbanization and region of residence, the household size and composition, as well as the income and other socio-demographic characteristics of household members.

Since HBSs also collect data on the households' food and beverage acquisitions and related contributions (including purchases, own production and offerings) they are a reliable source for identifying and monitoring food trends within and between countries. The use of HBSs data for nutritional purposes at the EU level, as well as globally, was highly advanced through the Data Food Networking (DAFNE) initiative ([www.nut.uoa.gr](http://www.nut.uoa.gr)), which has established a European regularly updated databank of comparable food and socio-demographic information that enables the identification and the follow up of trends among European countries. The expansion of this databank lead the way to the ANEMOS initiative.

In the ANEMOS project, two new countries were included in the network and more recent data on one of the DAFNE countries were also retrieved for analysis. This report presents data analysed by members of the DAFNE-ANEMOS network and has been compiled in the context of the ANEMOS work package 3 (WP3) on the dissemination of results.

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## THE ANEMOS INITIATIVE

The DAFNE Project – Data Food Networking – was successful in developing and evaluating a simple tool for monitoring food patterns in 25 European countries. The DAFNE databank contains information on food and beverage availability of European households and it is of great use to better understand people's food choices.

The ANEMOS initiative was developed to expand and update this database, by adding data from Estonia and Lithuania (2003-2007) as well as from Portugal (2005).

The new DAFNE-ANEMOS databank not only provides information on food and beverage availability in each country overall and by several characteristics such as locality of the residence, household composition, educational level and occupational status of the household head. It also aimed to add the new data to an online database where the available information is accessible to the public in a user-friendly manner, the DAFNE-ANEMOSSoft (<http://www.hhf-greece.gr/dafnesoftweb/>).

## THE ANEMOS METHODOLOGY

### ORIGIN OF THE DATA AND THEIR INCORPORATION IN THE CENTRAL DATABASE

The HBSs carried out in each participating country constitute the source of information. Each country's Statistical Office selected nationally representative samples of the population to carry out HBS at regular time intervals using harmonized methodologies that enable comparisons among countries. Information on household's consumption and expenditures of foods and beverages including different types of acquisition such as purchases, contribution of the household's own production and food items received as gifts as well as on socio-demographic characteristics of the household and members was collected.

The national datasets, together with their file description, were forwarded to the ANEMOS coordinating centre. The Visual Fox Pro programming language was used for the management and cleaning of the raw data. The data were stored in a preliminary database operating at the coordinating center after their reading and management were completed and approved by the data providers.

### DATA COLLECTION IN ESTONIA, LITHUANIA AND PORTUGAL

Estonia and Lithuania were the two new EU Member States, which joined the DAFNE-ANEMOS network. Their data have been integrated in the database, together with recent data from Portugal, already a member of the network. The data were collected for two weeks through food diaries, which were completed either by the head of the household (Portugal and Lithuania) or by trained interviewers (Estonia).

### CLASSIFICATION SCHEMES AND DATA HARMONIZATION

One of the outcomes of the DAFNE initiative was the development of a food classification system which facilitates international comparisons – The *DAFNE food and beverage classification scheme*. Moreover, it allows categorizing foods and beverages into 15 main groups and 56 detailed subgroups. In addition, within the DAFNE initiative, criteria for harmonizing the socio-demographic information were also established.

Besides the application of the DAFNE operational criteria and procedures for combining the collected information, working group meetings and bilateral visits also took place to address specific issues.





## THE FOOD AND BEVERAGES CLASSIFICATION SCHEME

In the ANEMOS project, the coordinating team has been closely collaborating with nutritionists from each participating country in order to classify the recorded food items under the comparable between countries groups.

### CEREALS

- Bread and rolls
- Bakery products (bread and rolls excluded)
- Rice, cereals and products (flour and pasta excluded)
- Flour
- Pasta

### MEAT, MEAT PRODUCTS AND DISHES

#### RED MEAT

- Pork meat (fresh and frozen)
- Beef, veal and calf meat (fresh and frozen)
- Red meat, other than pork or veal (fresh and frozen)

POULTRY (fresh and frozen)

OFFALS (fresh and frozen)

CANNED MEAT AND MEAT PRODUCTS

MEAT DISHES

### FISH, SEAFOOD AND DISHES

- Fish (fresh, frozen and processed)
- Seafood
- Fish dishes

### MILK AND MILK PRODUCTS

- Milk
- Cheese
- Milk products (cheese excluded)

### EGGS

### TOTAL ADDED LIPIDS

#### LIPIDS OF ANIMAL ORIGIN

- Butter
- Animal Fat (butter excluded)

#### LIPIDS OF VEGETABLE ORIGIN

- Vegetable fat
- Margarine
- Vegetable fat (margarine excluded)
- Vegetable oils
- Olive oil
- Seed oils

### POTATOES AND OTHER STARCHY ROOTS (potato products included)

### PULSES

### VEGETABLES

#### FRESH VEGETABLES

- Green leafy vegetables
- Cabbage
- Tomatoes
- Carrots
- Onions, garlic and leek
- Other fresh vegetables

#### PROCESSED VEGETABLES

### NUTS

### FRUITS

#### FRESH FRUITS

- Apples
- Citrus fruits
- Bananas
- Grapes
- Plums
- Berries
- Apricots and peaches
- Cherries and sour cherries
- Pears
- Other fresh fruits

#### PROCESSED FRUITS

### SUGAR AND SUGAR PRODUCTS

- Sugar
- Sugar products

### NON-ALCOHOLIC BEVERAGES

#### STIMULANTS

- Coffee
- Tea and Infusions
- Cocoa

#### MINERAL WATER

#### SOFT DRINKS

### FRUIT AND VEGETABLE JUICES

- Fruit juices
- Vegetable juices

### ALCOHOLIC BEVERAGES

- Wine
- Beer
- Spirits

## THE CLASSIFICATION SCHEME FOR SOCIO-DEMOGRAPHIC CHARACTERISTICS

Several socio-demographic characteristics are recorded in the HBSs. Focus was, however, put on the locality of the residence, the educational status and occupation of the household head and on the household's composition. Variables related to the above characteristics were classified under common between countries groupings. In particular:

### • **Locality of the residence**

Using various criteria (e.g. number of inhabitants, population density) the following three categories of locality were formed:

- Rural,
- Semi-urban,
- Urban.

In countries of a relatively small size the identification of semi-urban areas was not feasible.

### • **Education of the household head**

Though differences in the national educational systems do exist, data on the education of the household head could be classified under three comparable categories of educational attainment:

- Illiterate / Elementary education,
- Secondary education,
- Higher education (College/University).

### • **Occupation of the household head**

Occupation reflects a number of characteristics including education, income and physical activity. If properly harmonized, it can provide a suitable basis for comparison of dietary practices. In the ANEMOS project, occupation was classified under the five categories below, based on the employment status and the profession, if employed, of the household head:

- Manual,
- Non-manual,
- Retired,
- Unemployed,
- Others (students, housewives or invalid persons as households' heads).

### • **Household composition**

Though not frequently considered in dietary analyses, household composition can have an influence on dietary choices and practices. With children defined as being up to 18 years old, adults being between 19 and 65 years of age and individuals more than 65 years old considered as elderly and with an intended distinction between single and other households, eight categories were formed:

- Households of one adult resident (single adult households),
- Households of two adult residents,
- Households of one adult resident and children (lone parent),
- Households of two adult residents and children,
- Households of adult and elderly residents,
- Households of children, adult and elderly residents,
- Households of one elderly resident (single elderly households),
- Households of two elderly residents,
- Others (all households that are left unclassified).

## CALCULATION OF THE AVERAGE DAILY INDIVIDUAL FOOD AND BEVERAGES AVAILABILITY

Overall food availability per person per day was calculated by dividing the household availability by the product of the referent time period and the mean household size. Individual availability was estimated without making allowances for inedible parts, preparation losses, or spoilage on the plate and under the assumption of equal distribution of food within the household and during the survey period. In cases where the national data providers particular recommended it, a weighting factor is incorporated to address sampling limitations. Besides the overall availability, the average availability by each socio-demographic group was also estimated.

## INTEGRATION IN THE DAFNE-ANEMOSSOFT

The final data have been integrated in the DAFNE-ANEMOS database which can be accessed through the Dafne-AnemosSoft, an application tool freely available at <http://www.hhf-greece.gr/dafnesoftweb/>.

A leaflet with the specific features and other information on the use of Dafne-AnemosSoft was produced and is available at the ANEMOS website ([http://www.hhf-greece.gr/anemos\\_eng.html](http://www.hhf-greece.gr/anemos_eng.html)).



## THE ANEMOS RESULTS

### MONITORING FOOD AVAILABILITY IN EUROPE (GRAPHS AND MAPS)

In **Section A**, a brief, general overview of the ANEMOS' results is provided. Focus has been placed on Estonia, Lithuania and Portugal, as it was the food and beverage availability information from these countries which brought novelty in and enrichment of the database.

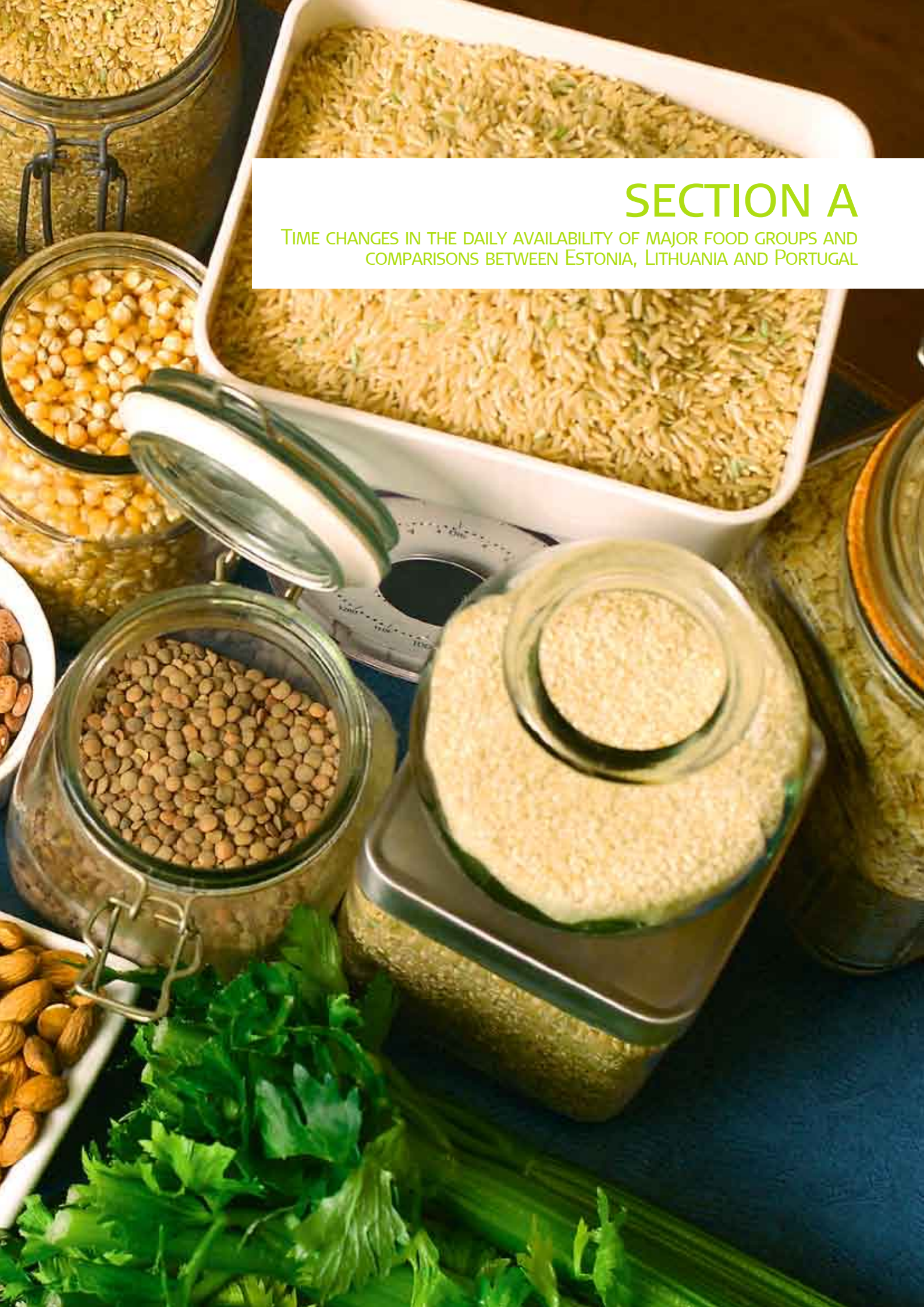
When interpreting the results, it must be noted that the time interval for which food availability was compared in the case of Portugal was larger (1990-2005) than for Estonia and Lithuania (2003-2007).

**Section B** offers insight to the possible uses of the DAFNE-ANEMOS database. Comparisons between the daily per person food and beverages availability in several European countries are presented. Due to the number of food groups available, those of public health interest (i.e fruits; vegetables; fruit and vegetable juices; meat, meat products and dishes; fish, seafood and dishes; added lipids; soft-drinks; sugar and sugar products; alcoholic beverages) were selected to be graphically presented.

While retrieving the data to be presented, for each country the most recent survey year available in the DAFNE-ANEMOS databank were used. Hence, in some instances comparisons require careful interpretation.





A high-angle, close-up photograph of various food items arranged on a dark blue surface. In the center is a large white rectangular dish filled with long-grain rice. To its left is a glass jar with a metal clasp lid, filled with yellow corn kernels. Below that is another glass jar with a metal clasp lid, filled with brown lentils. In the foreground, there is a pile of fresh green parsley and a small white dish filled with almonds. To the right of the lentil jar is a large, clear plastic container filled with a light-colored, textured substance, possibly a type of grain or seed. The background shows more jars and containers, some filled with grains. The lighting is warm and focused on the food items.

## SECTION A

TIME CHANGES IN THE DAILY AVAILABILITY OF MAJOR FOOD GROUPS AND  
COMPARISONS BETWEEN ESTONIA, LITHUANIA AND PORTUGAL

## OVERALL RESULTS

In Lithuania and Estonia, an increase in the availability of nuts, fruits, fruit and vegetable juices, non-alcoholic and alcoholic beverages was noted from 2003 to 2007, while the availability of all other food groups either decreased or remained stable. In Portugal from 1990 to 2005 there was an increase in the daily availability of fruit and vegetable juices and also a rise in the availability of nuts, milk and milk products. On the other hand, in the 15 year period under study, there was a decrease in the daily availability of most food groups, except for fish, meat and vegetables which practically remained stable.

Comparing the three countries' 2005 data, the highest availability values were reported in Lithuania - cereals, potatoes, sugar and sugar products, non-alcoholic beverages, vegetables, meat, meat products and dishes, milk and milk products and added lipids. Exceptions were observed in Portugal, where the availability of alcoholic beverages, fruit, fish, seafood and dishes was found to be higher. In Estonia, fruit and vegetable juices were higher than in Lithuania or Portugal.



## LOCALITY OF THE HOUSEHOLD

A common trend was observed in all three countries. It appears that among urban households the availability of fruits, non-alcoholic beverages, fruit and vegetable juices tends to be higher. An opposite trend was recorded in rural areas, where, in all three countries during the time period considered, higher availability of cereals, potatoes, pulses, sugar and sugar products as well as added lipids were found.

## EDUCATION OF THE HOUSEHOLD HEAD

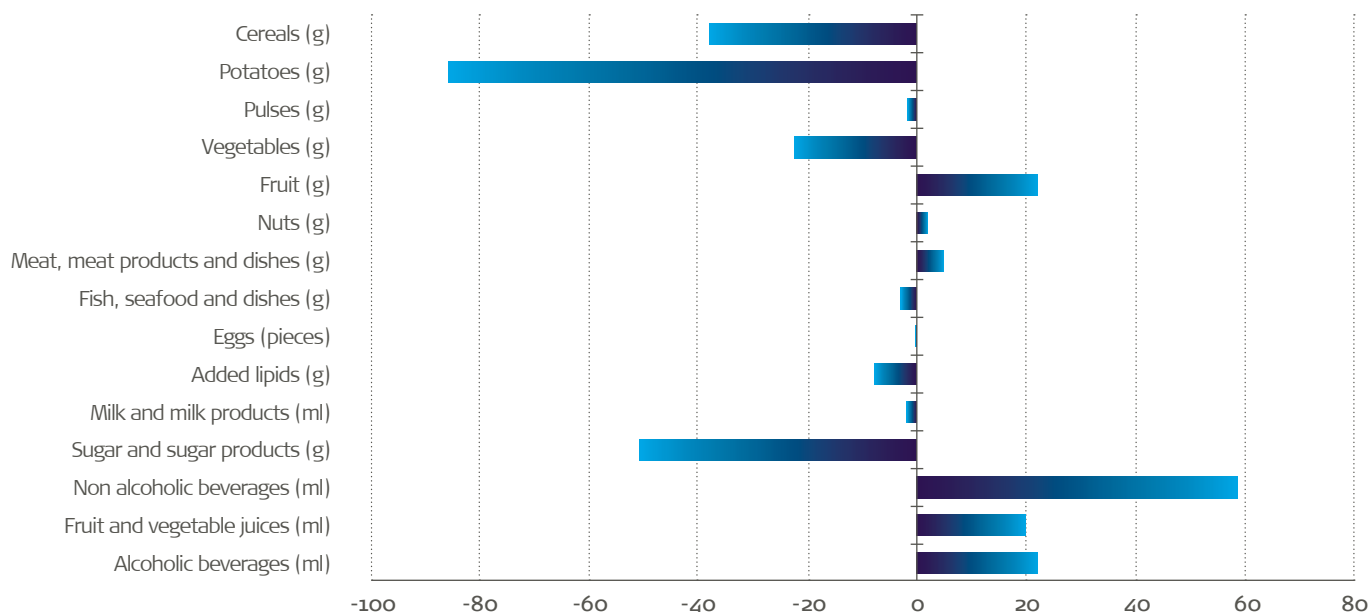
Similar conclusions were drawn in Estonia, Lithuania and Portugal when it comes to the effect of the educational level on food availability. Interestingly, nuts, fruit and vegetable juices, fruit and non-alcoholic beverages were available in higher quantities by households of higher education. Potatoes, cereals, pulses and added lipids on the other hand were more available among households whose head was of lower educational level. Estonia and Lithuania reported a similar pattern when it comes to meat, meat products and dishes as well as sugar and sugar products, which appear to be more available among the households of lower education.



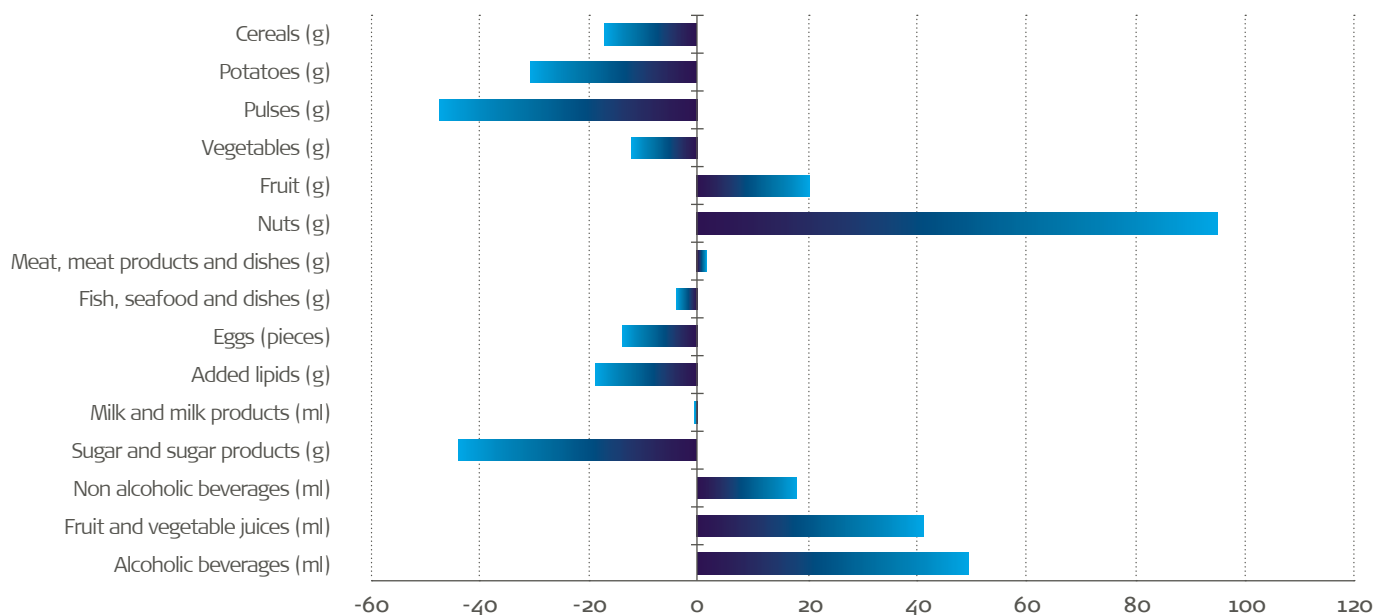


# ESTONIA

**Graph 1** Change in mean food availability, from 2003 to 2007  
(quantity/person/day)



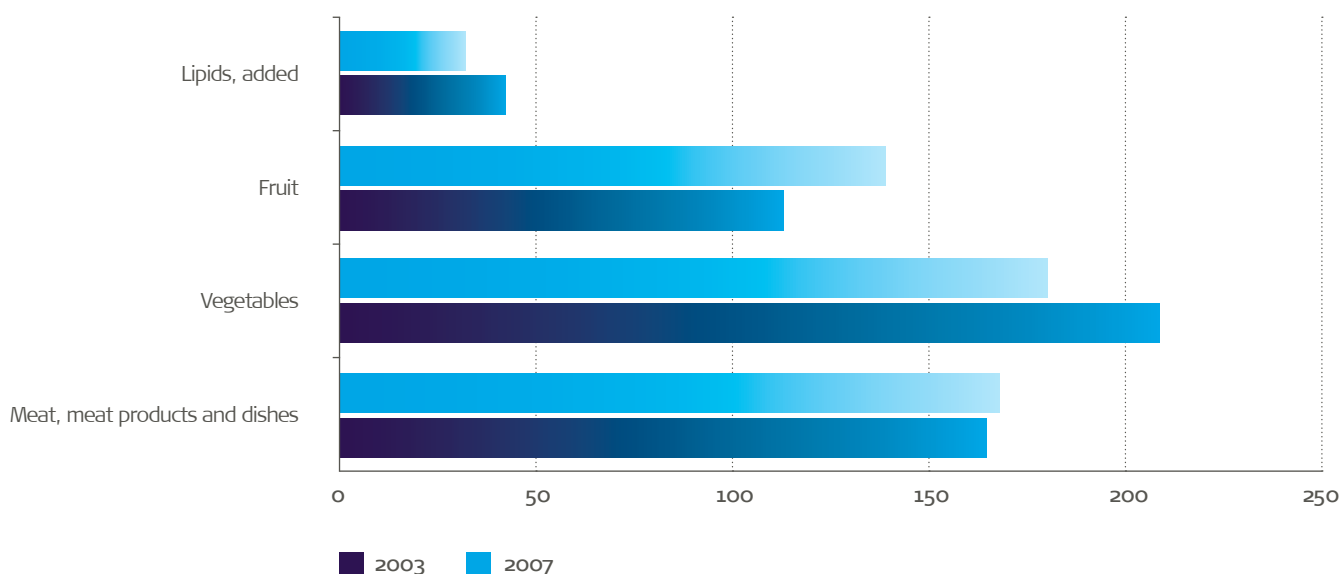
**Graph 2** Percent change in mean food availability, from 2003 to 2007  
(quantity/person/day)



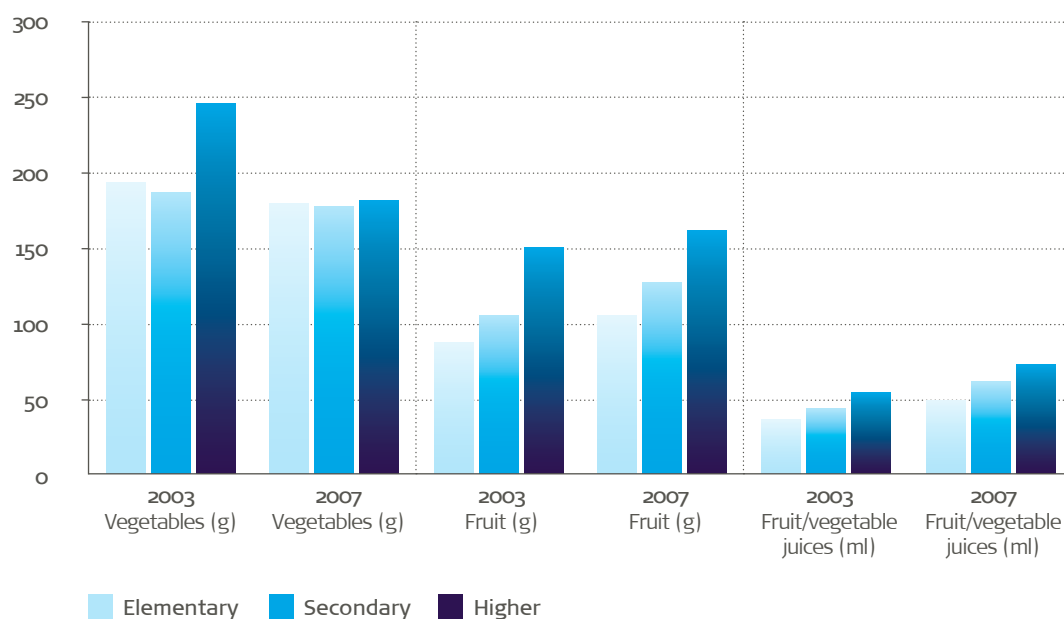


# ESTONIA

**Graph 3** Average availability of four food groups, by year  
(g/person/day)



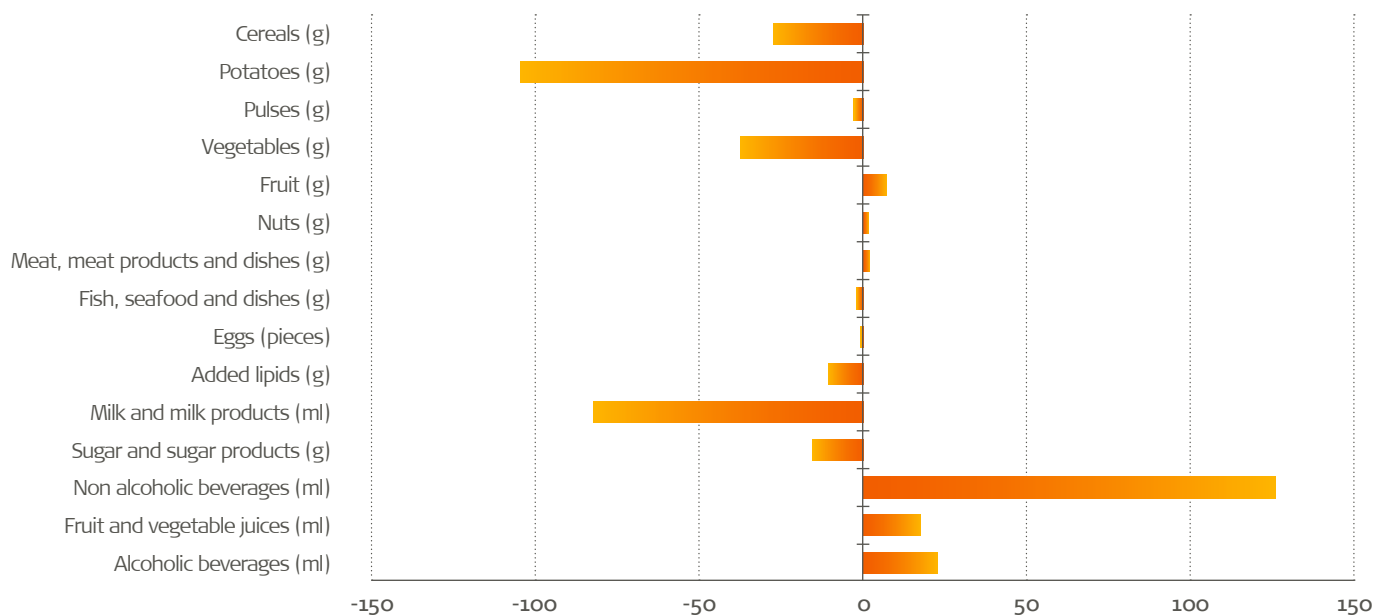
**Graph 4** Mean availability of vegetables, fruit and juices, by educational level of the head of the household, in 2003 and 2007  
(quantity/person/day)



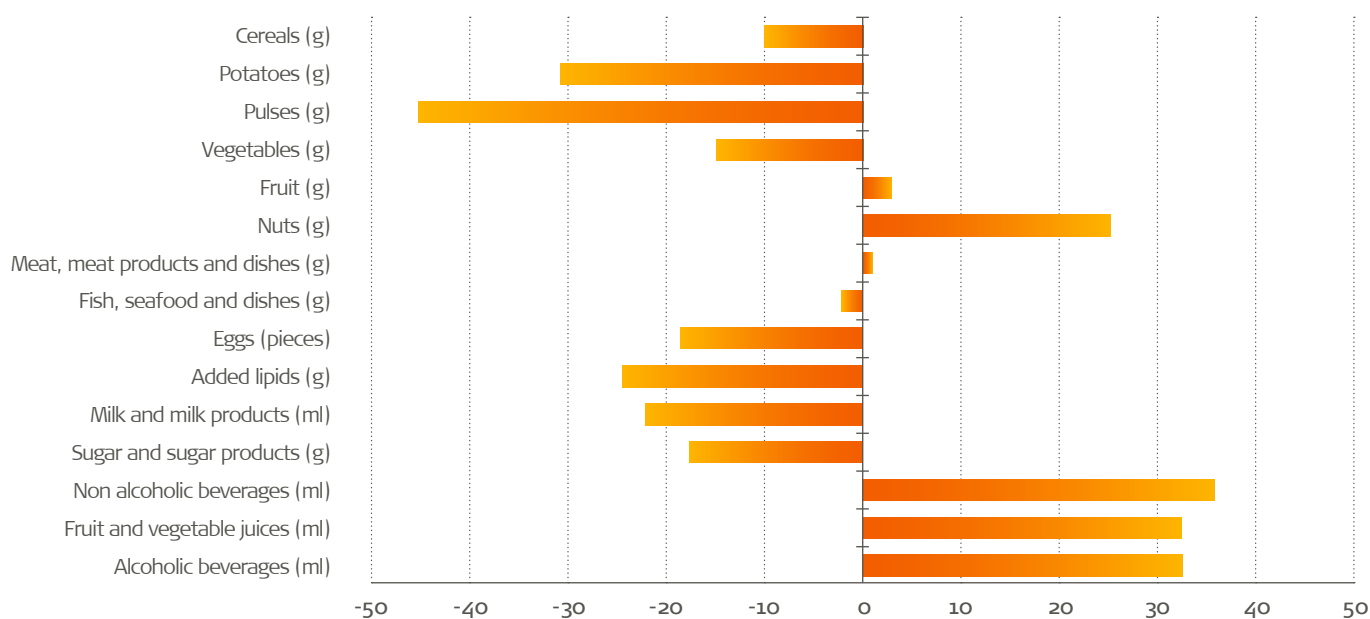


# LITHUANIA

**Graph 5** Change in mean food availability, from 2003 to 2007  
(quantity/person/day)



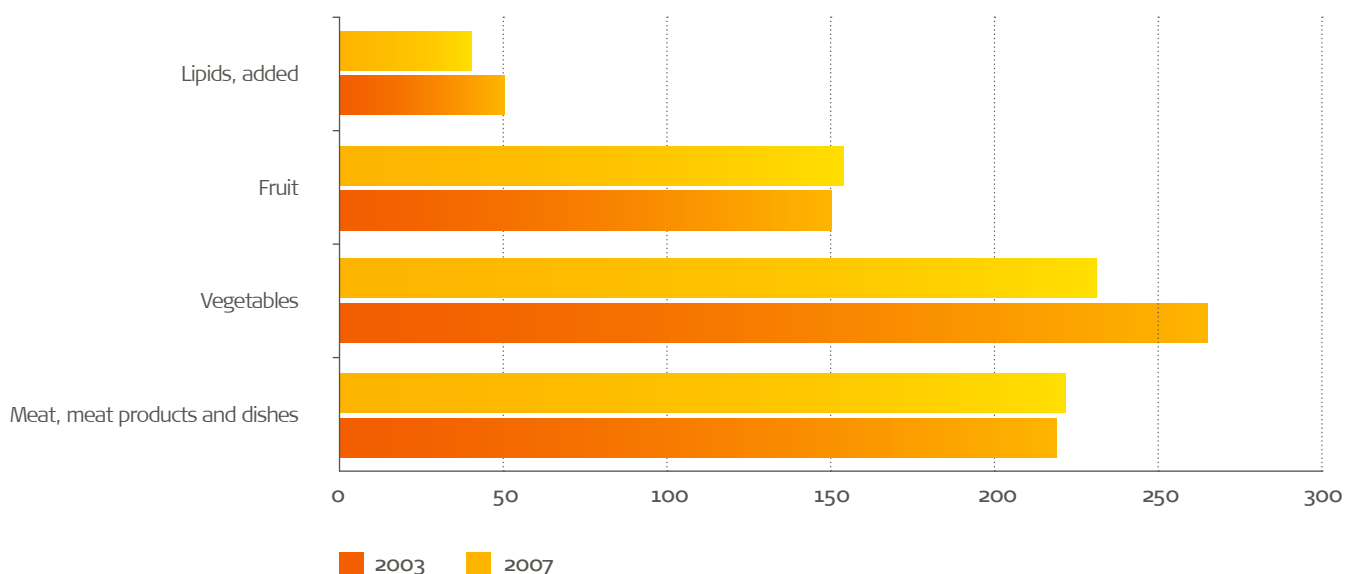
**Graph 6** Percent change in mean food availability, from 2003 to 2007  
(quantity/person/day)



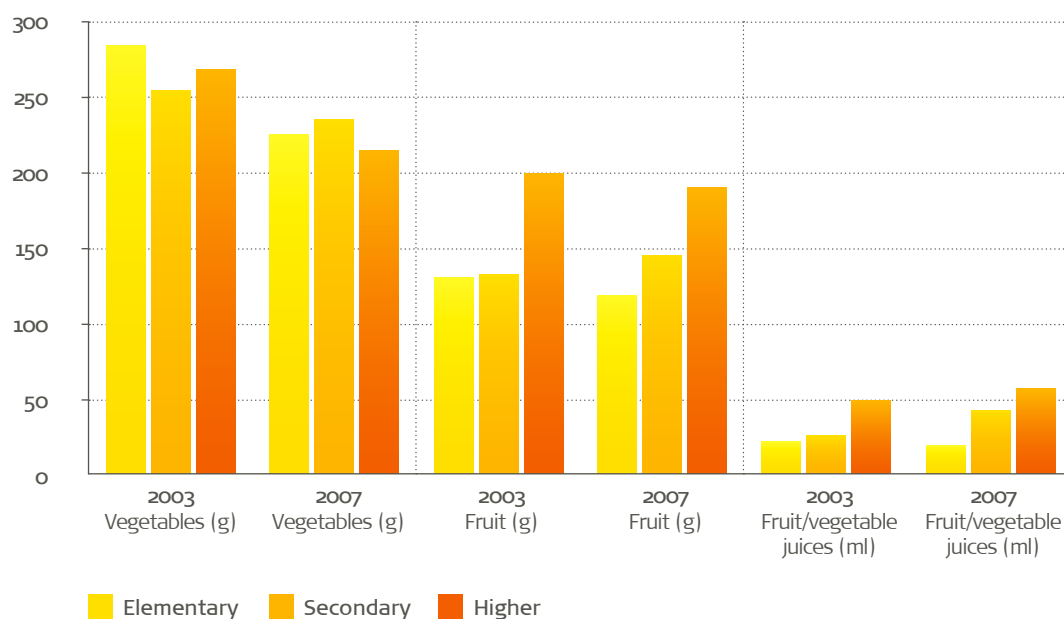


# LITHUANIA

**Graph 7** Average availability of four food groups, by year  
(g/person/day)



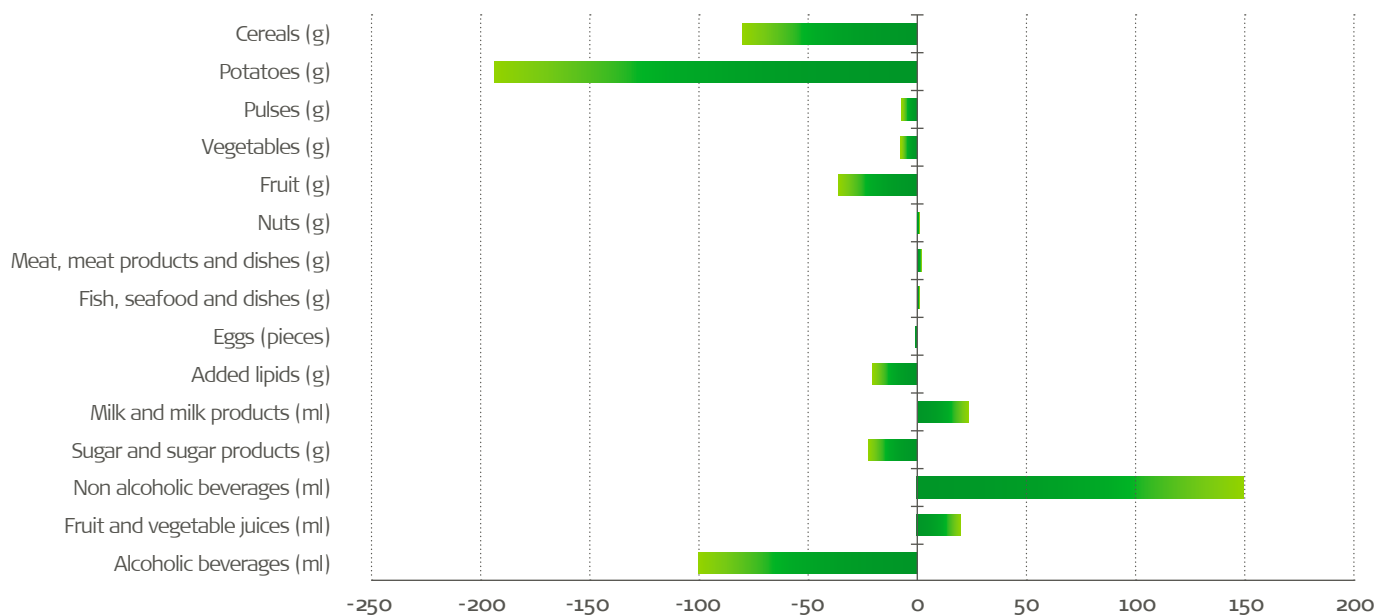
**Graph 8** Mean availability of vegetables, fruit and juices, by educational level of the head of the household, in 2003 and 2007  
(quantity/person/day)



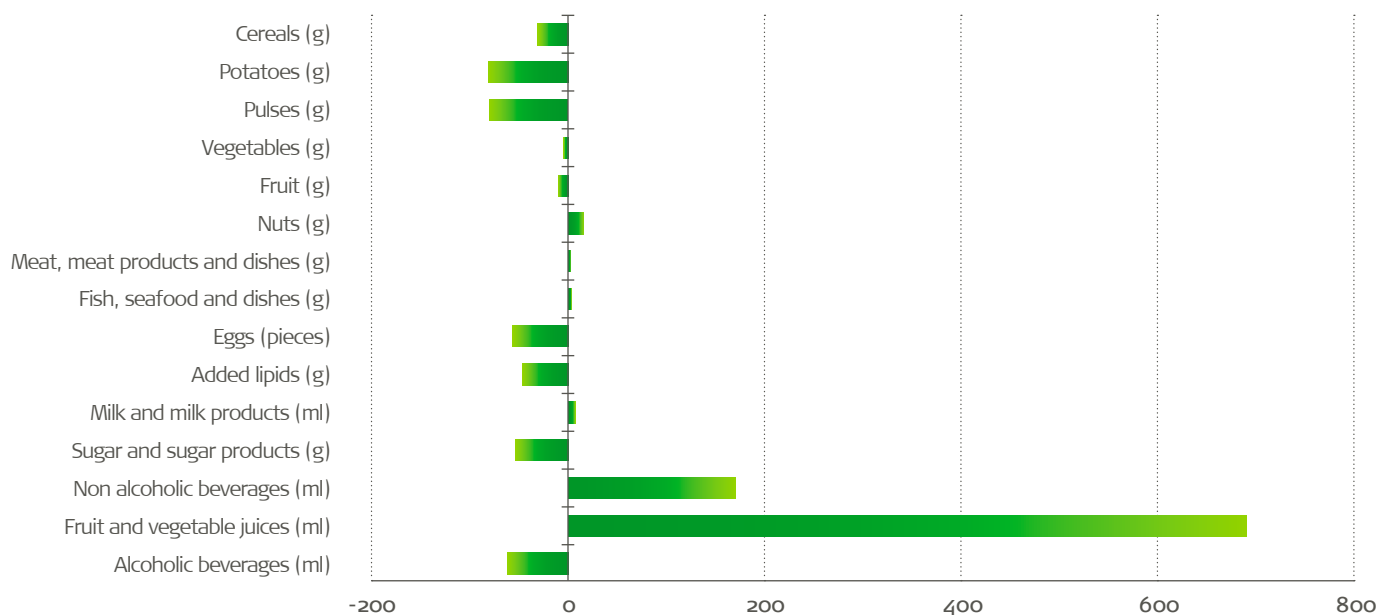


# PORTUGAL

**Graph 9** Change in mean food availability, from 1990 to 2005  
(quantity/person/day)



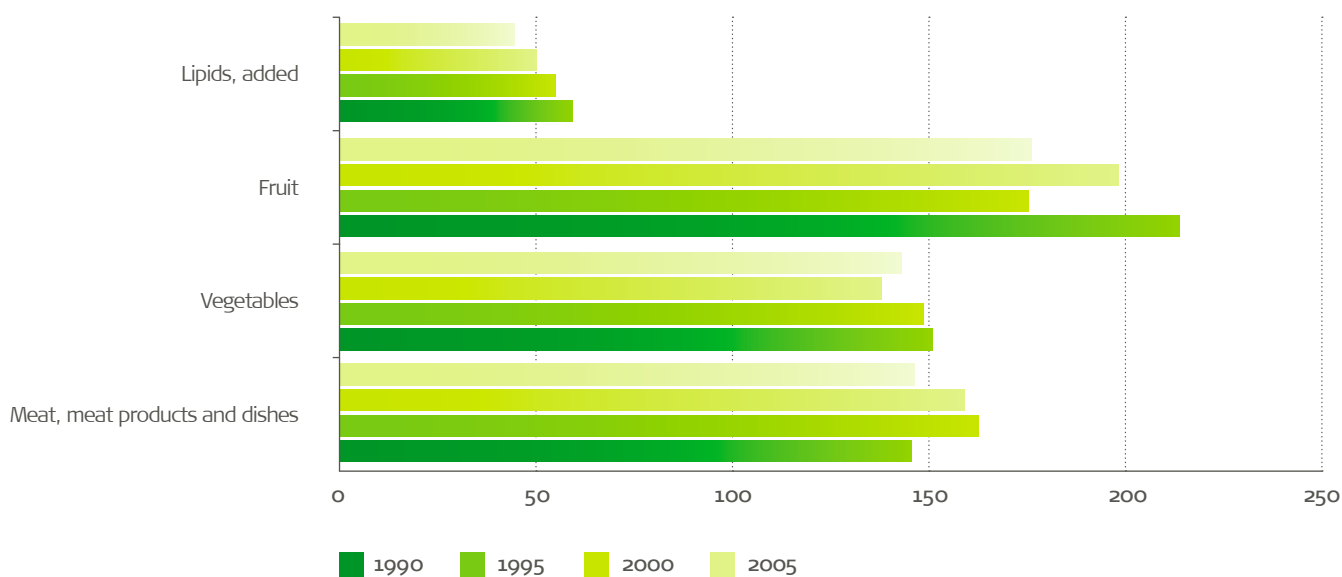
**Graph 10** Percent change in mean food availability, from 1990 to 2005  
(quantity/person/day)



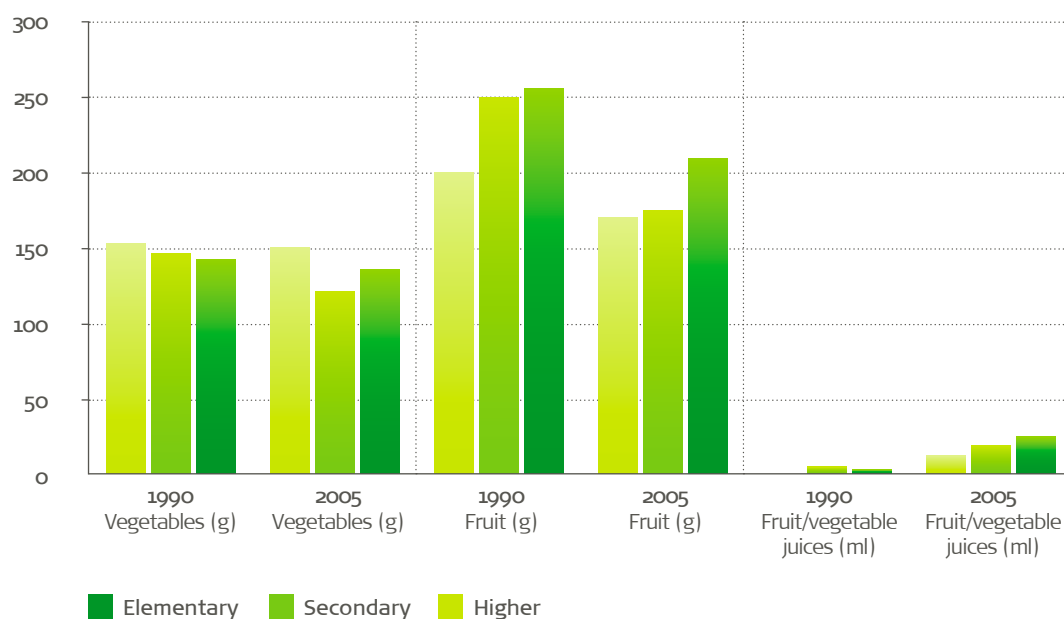


# PORTUGAL

**Graph 11** Average availability of four food groups, by year  
(g/person/day)



**Graph 12** Mean availability of vegetables, fruit and juices, by educational level of the head of the household, in 1990 and 2005  
(quantity/person/day)





ESTONIA

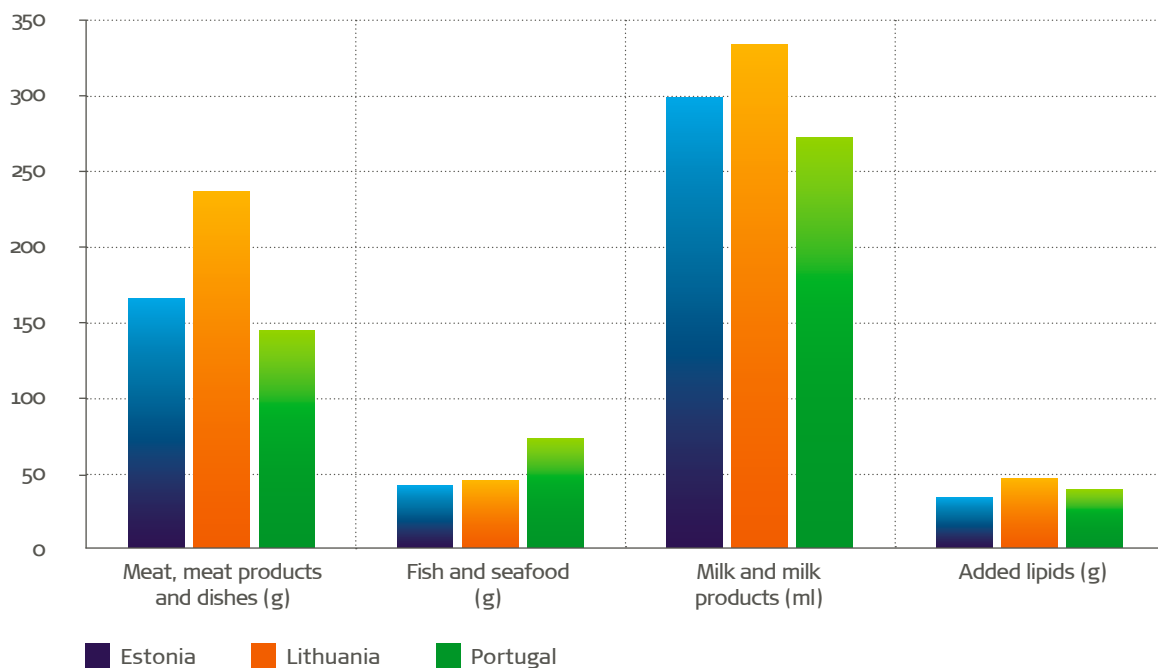


LITHUANIA

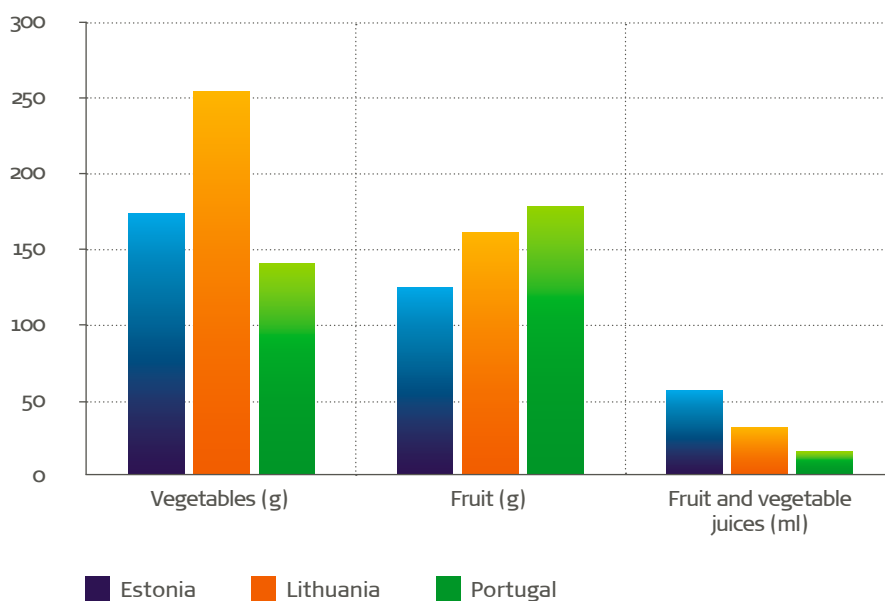


PORTUGAL

**Graph 13** Average availability of main food groups in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)



**Graph 14** Average availability of main food groups in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)





ESTONIA

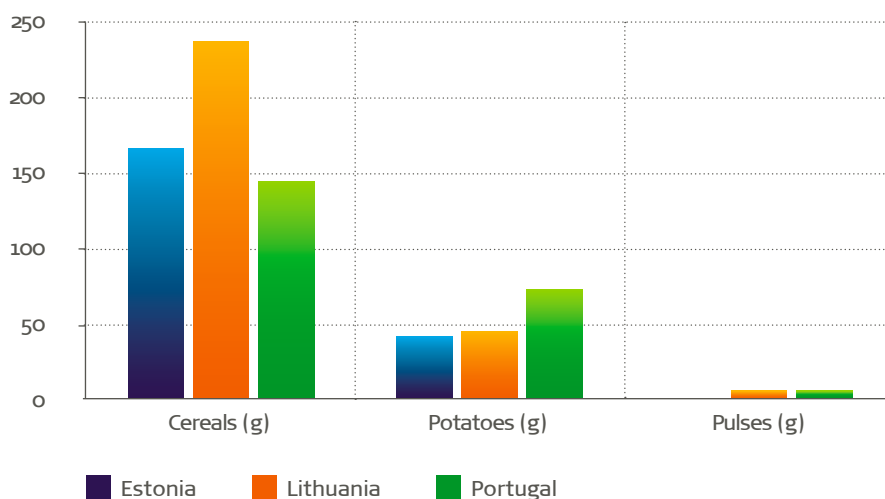


LITHUANIA

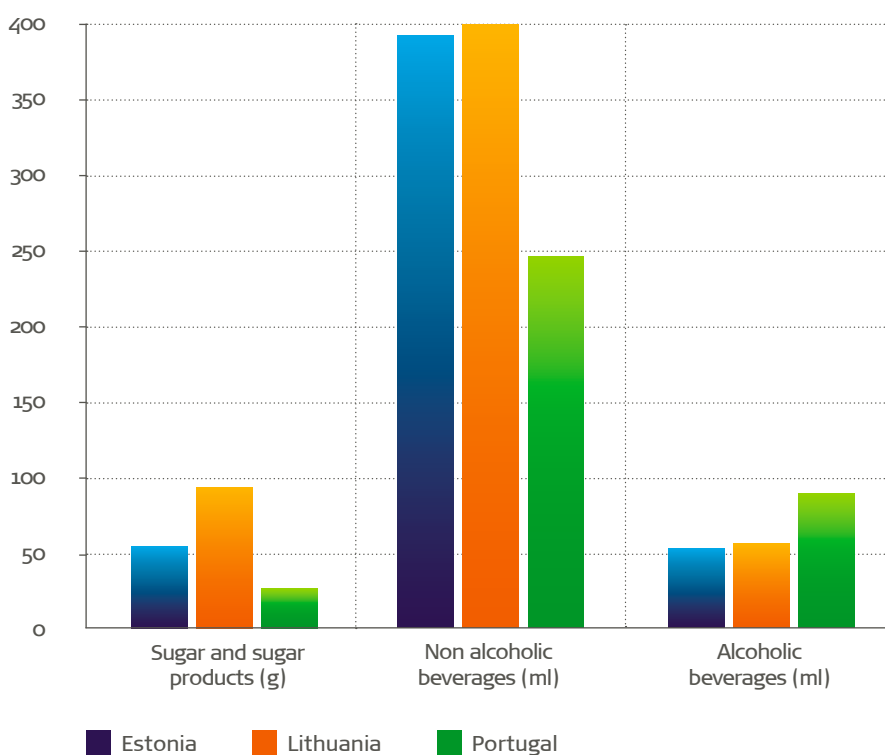


PORTUGAL

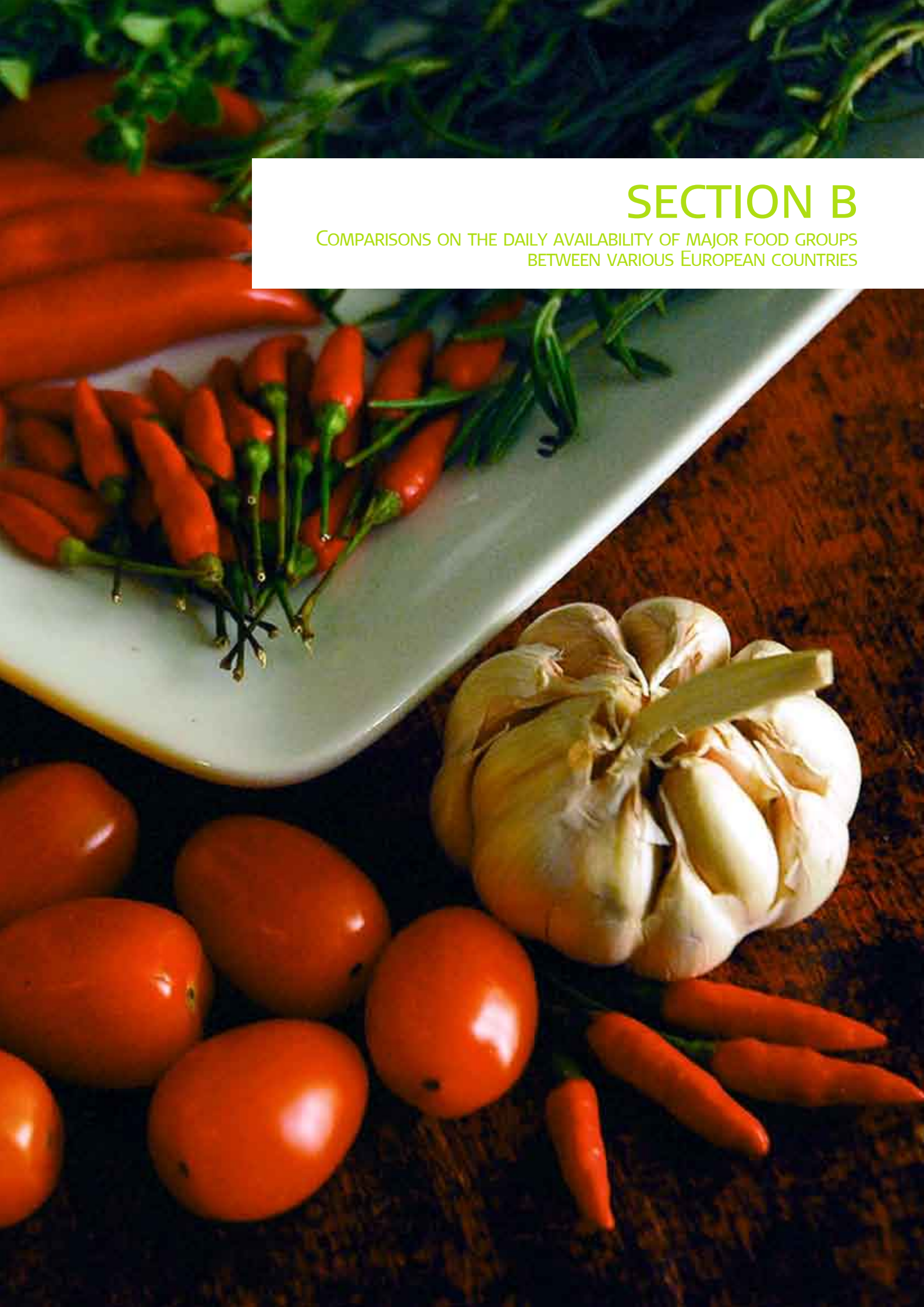
**Graph 15** Average availability of main food groups in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)



**Graph 16** Average availability of main food groups in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)





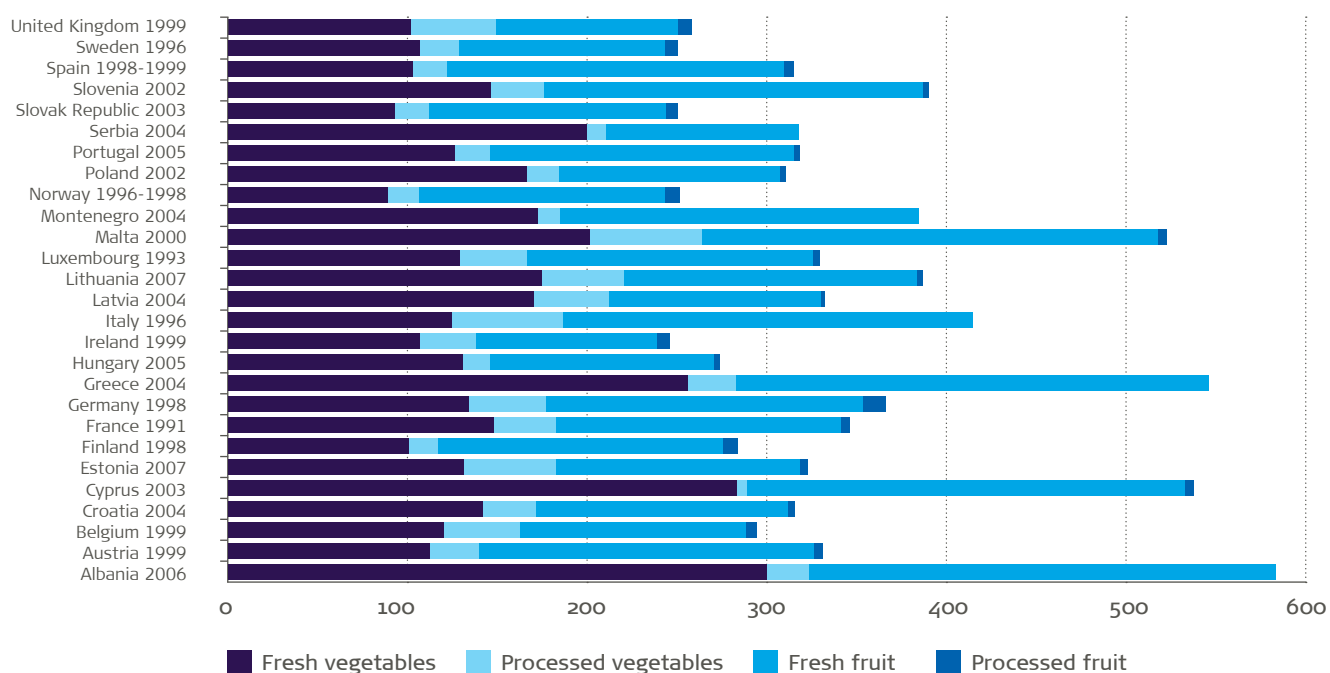
A still life photograph of fresh vegetables. In the upper left, a bunch of red chili peppers with green stems sits on a white rectangular plate. Below the plate, several round, ripe red tomatoes are scattered on a dark, textured wooden surface. To the right of the tomatoes is a whole head of garlic with its papery skin partially peeled. A few more red chili peppers are scattered near the bottom right. The lighting is dramatic, coming from the side, creating strong highlights and deep shadows.

## SECTION B

COMPARISONS ON THE DAILY AVAILABILITY OF MAJOR FOOD GROUPS  
BETWEEN VARIOUS EUROPEAN COUNTRIES

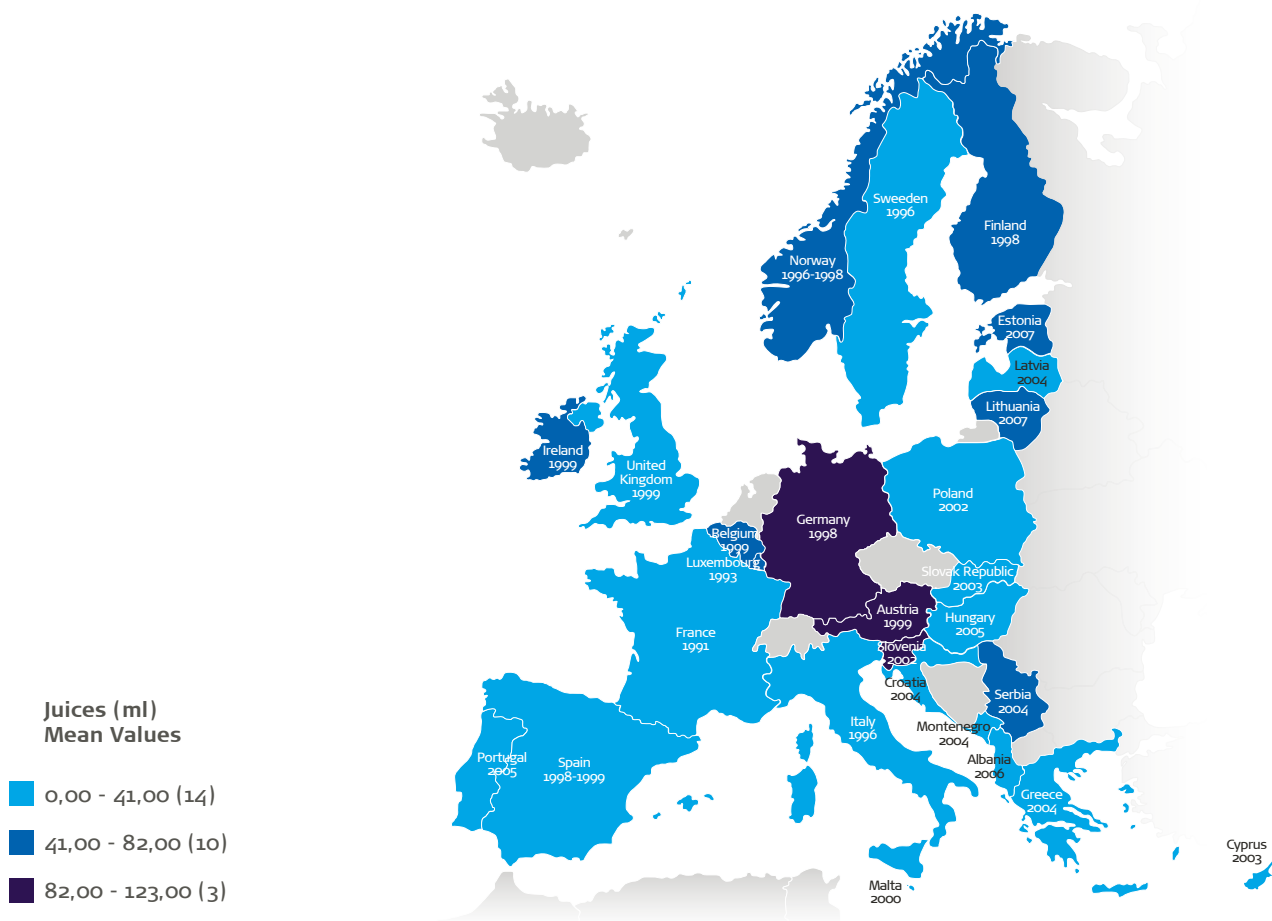
Graph 17

**Average availability of vegetables (fresh and processed) and fruit (fresh and processed) in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)**

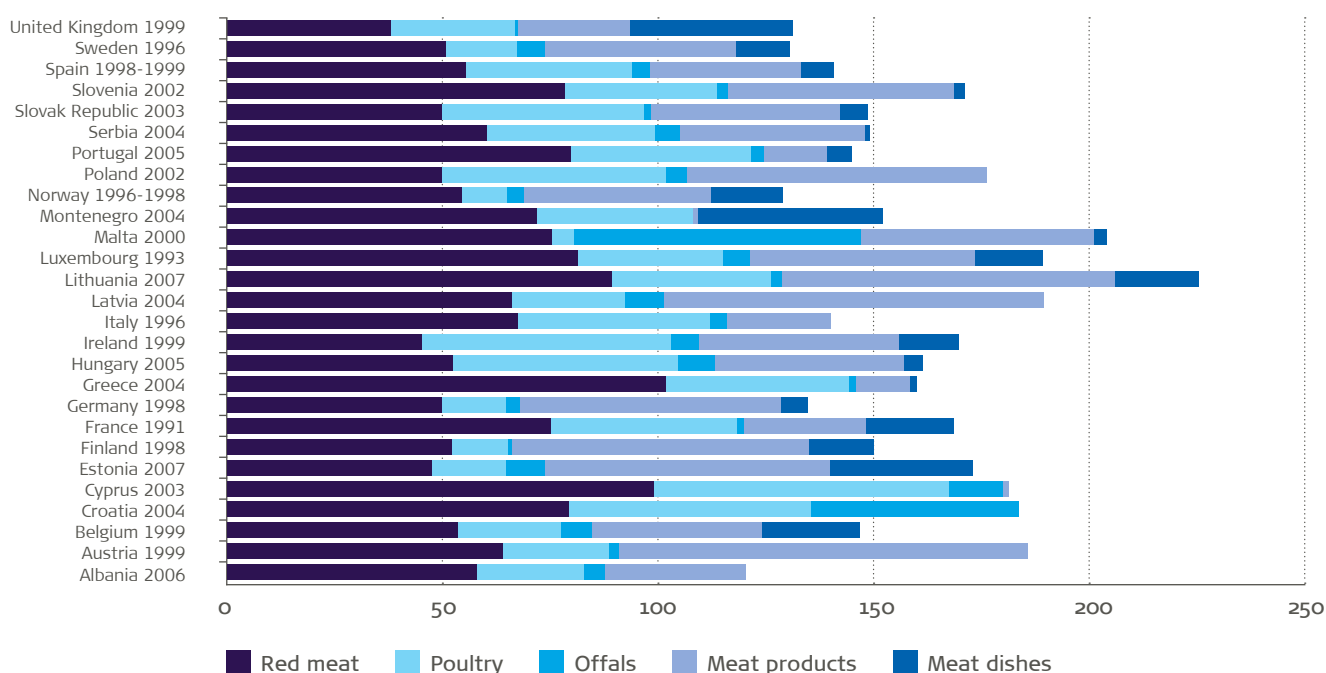


Map 1

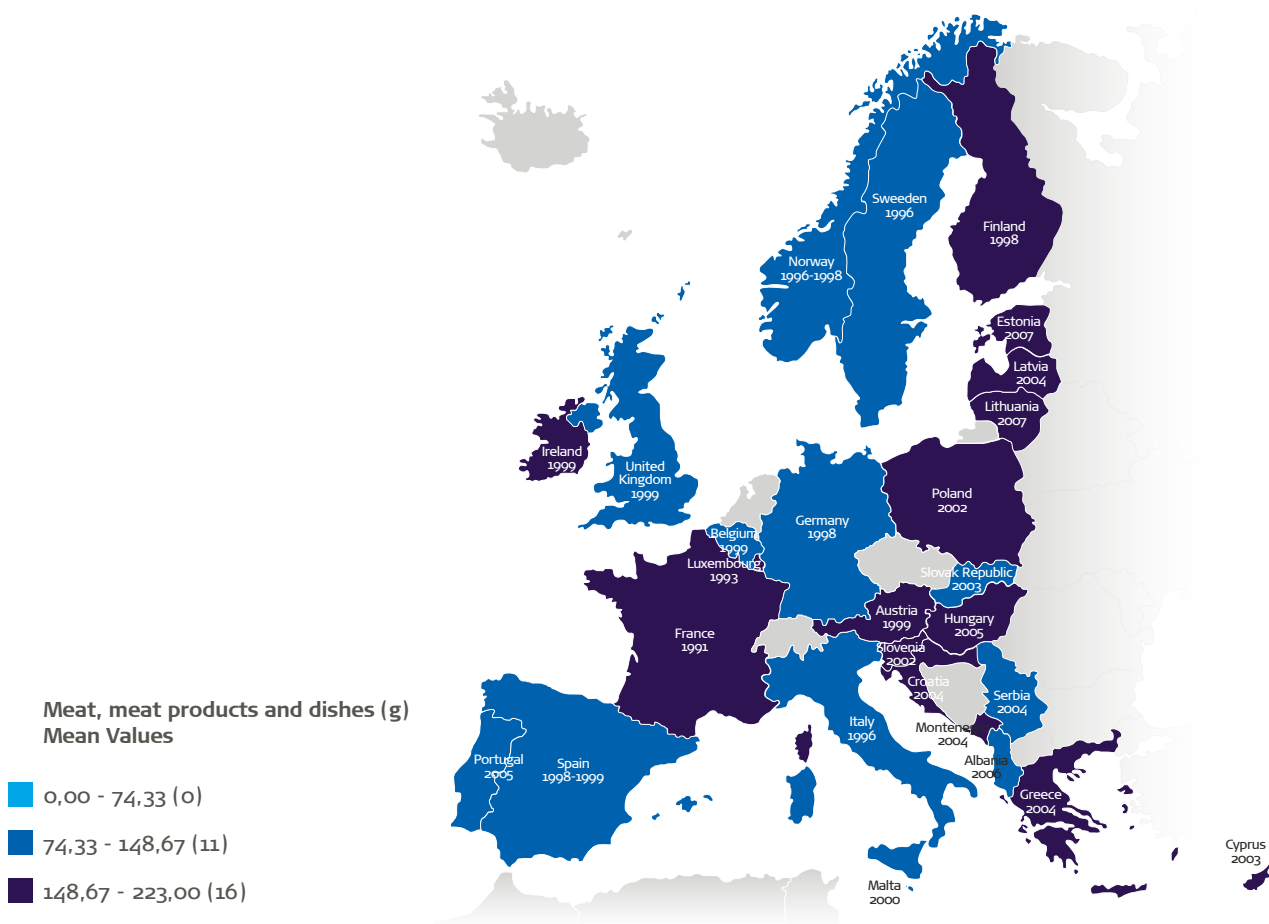
**Availability of juices (fruit and vegetable) in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)**



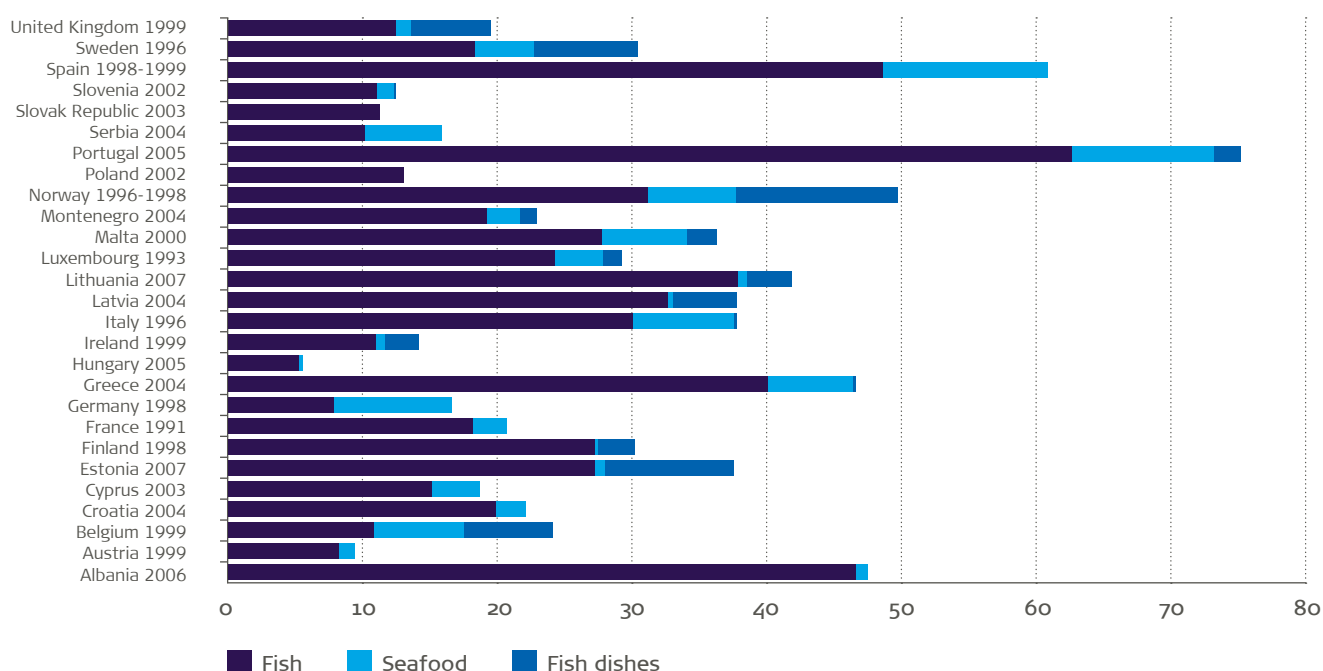
**Graph 18** Average availability of meat, meat products and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)



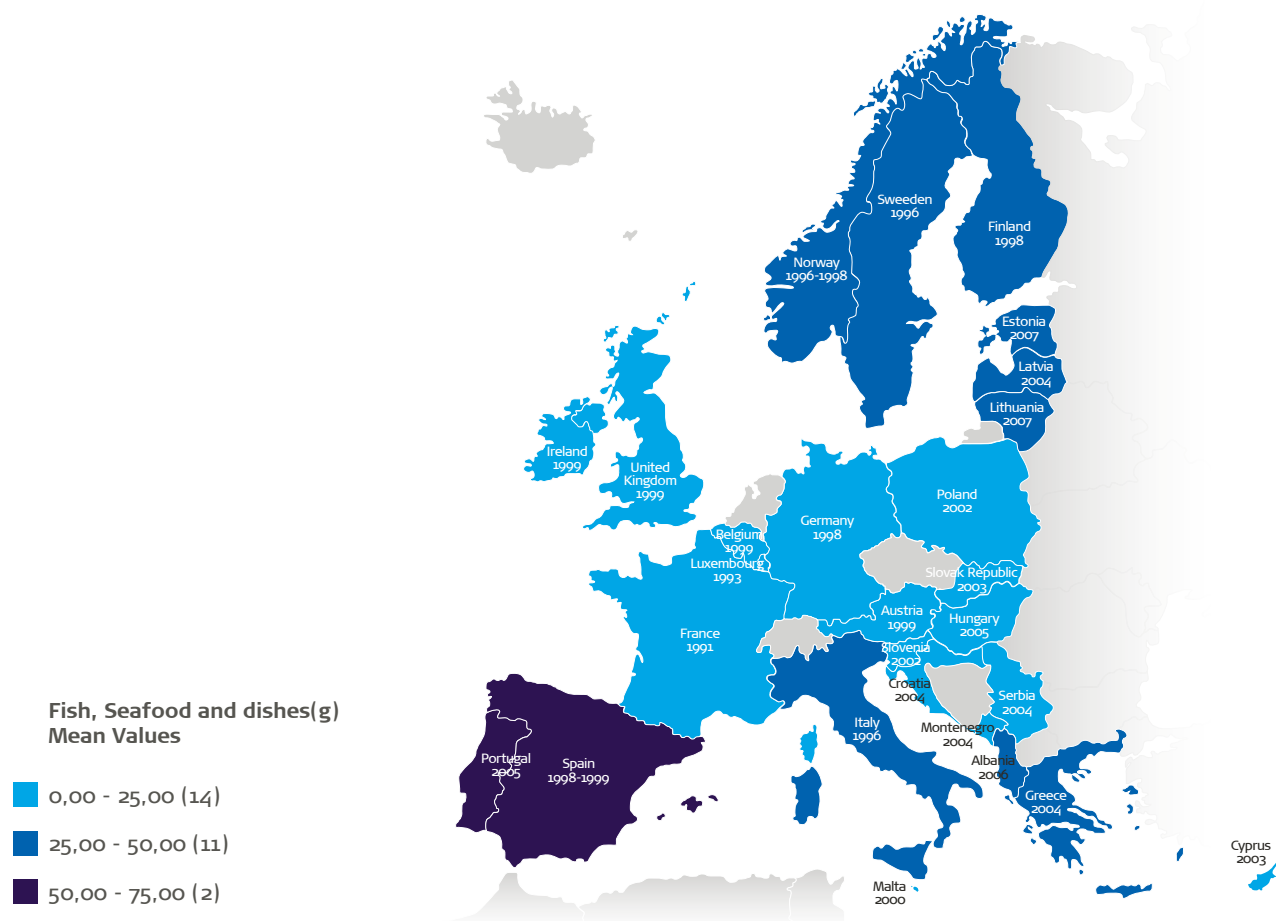
**Map 2** Availability of meat, meat products and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)



**Graph 19** Average availability of fish, seafood and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

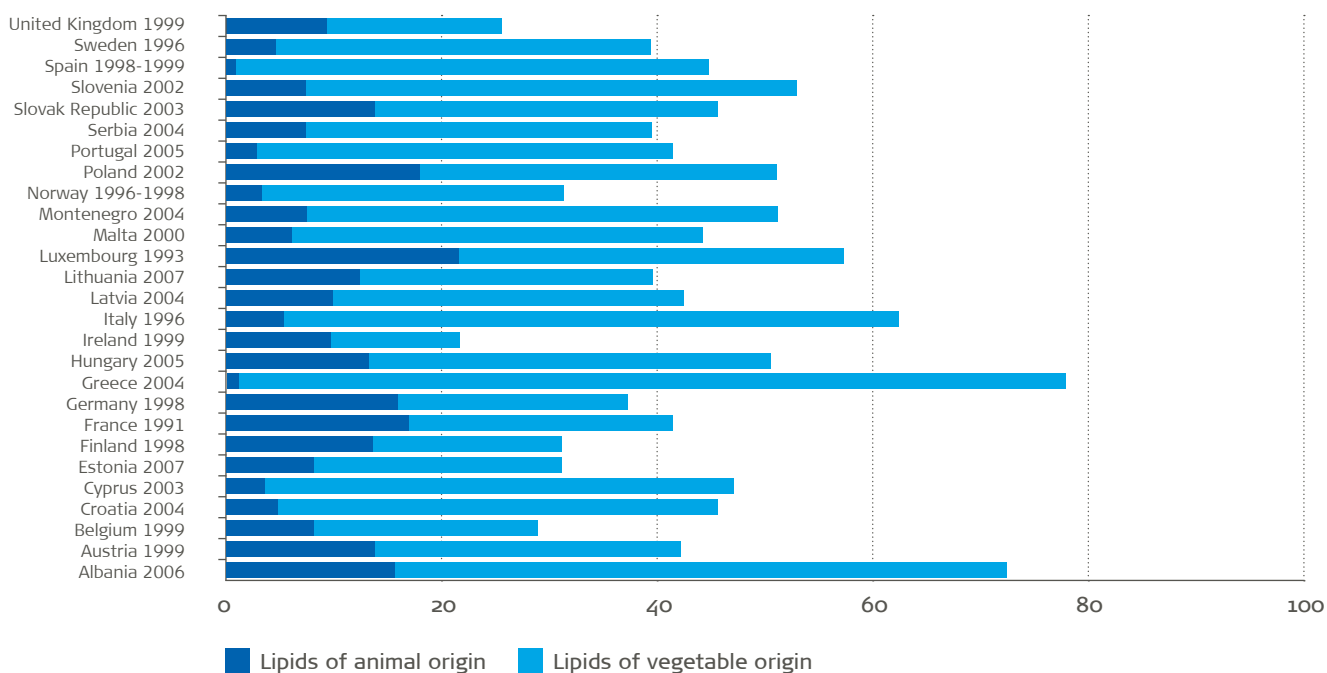


**Map 3** Availability of fish, seafood and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)



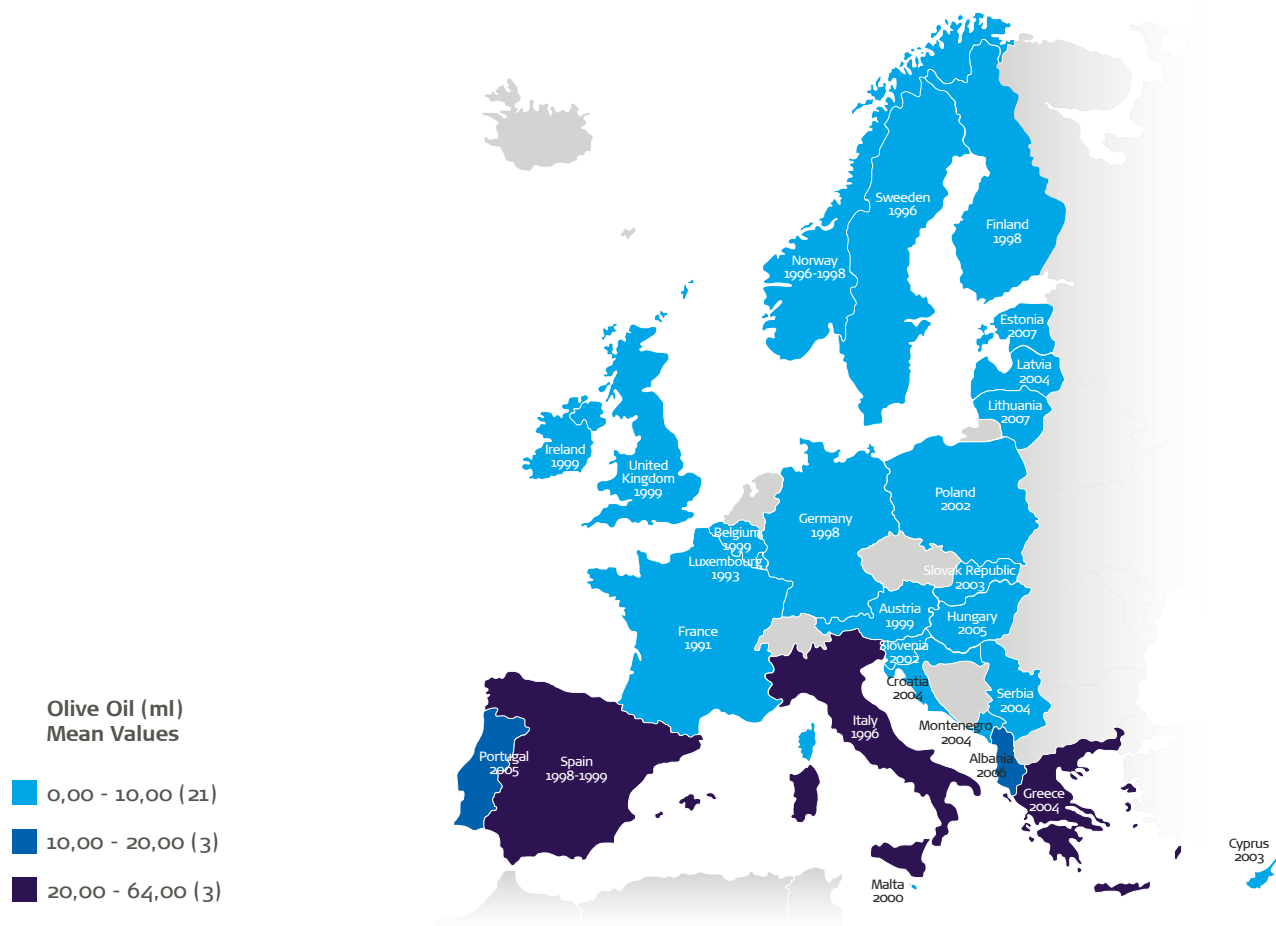
Graph 20

**Average availability of added lipids of animal and vegetable origin in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)**



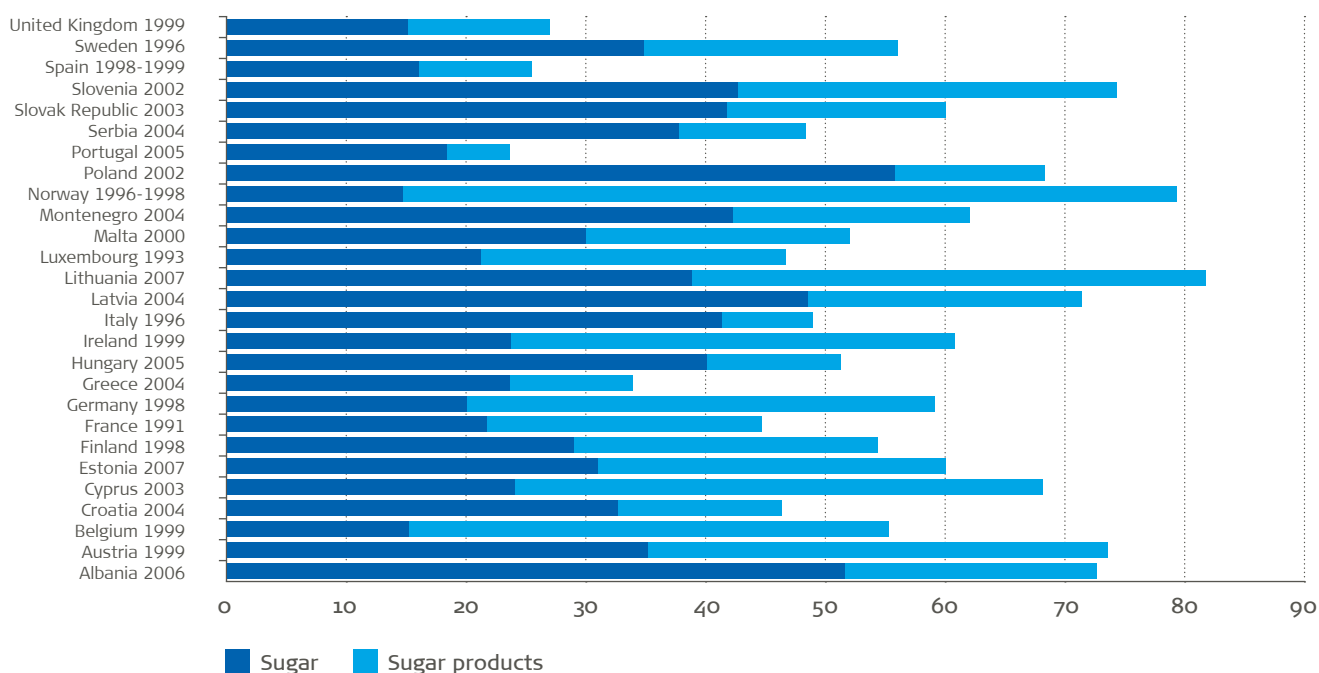
Map 4

**Average availability of olive oil in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)**



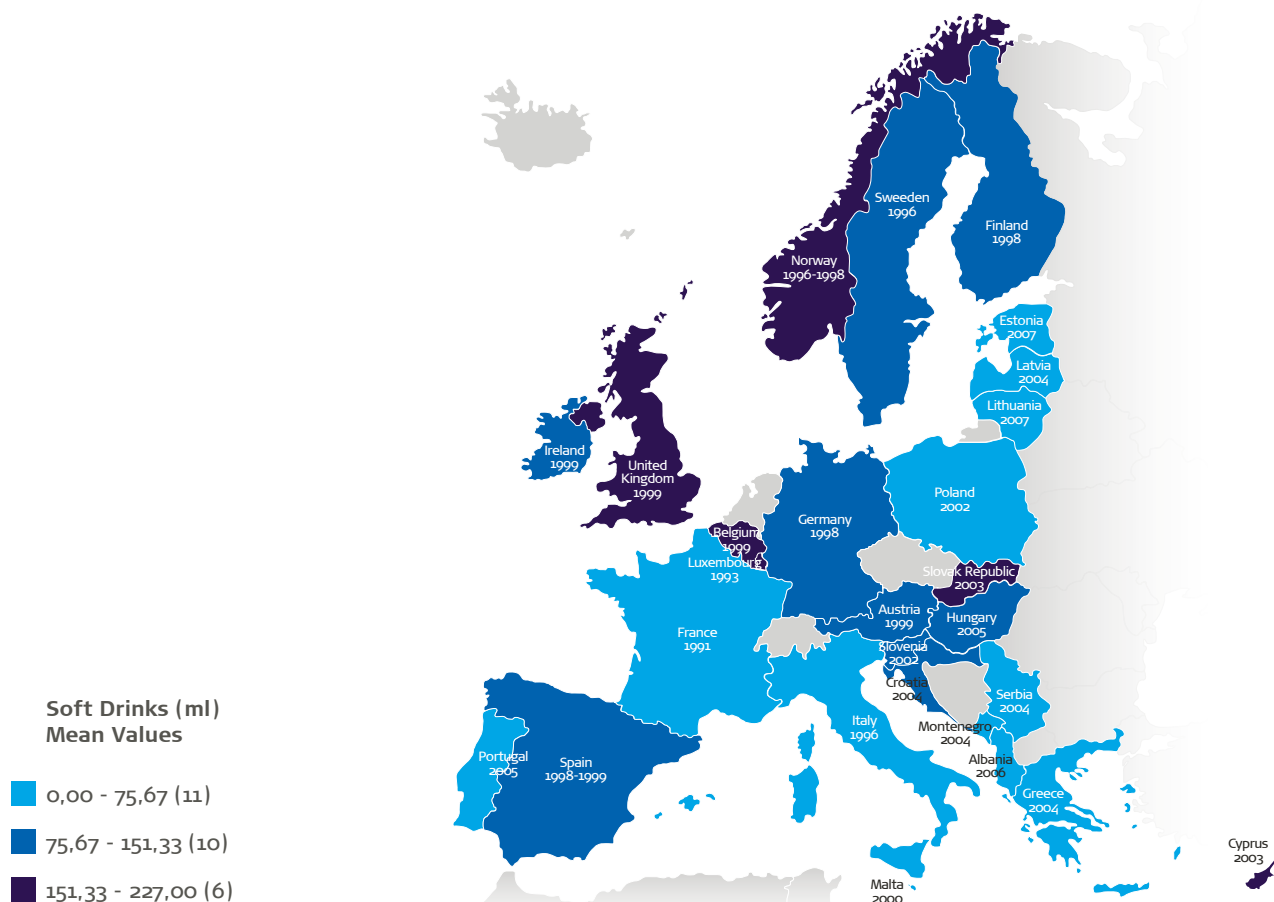
Graph 21

# Average availability of sugar and sugar products in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)



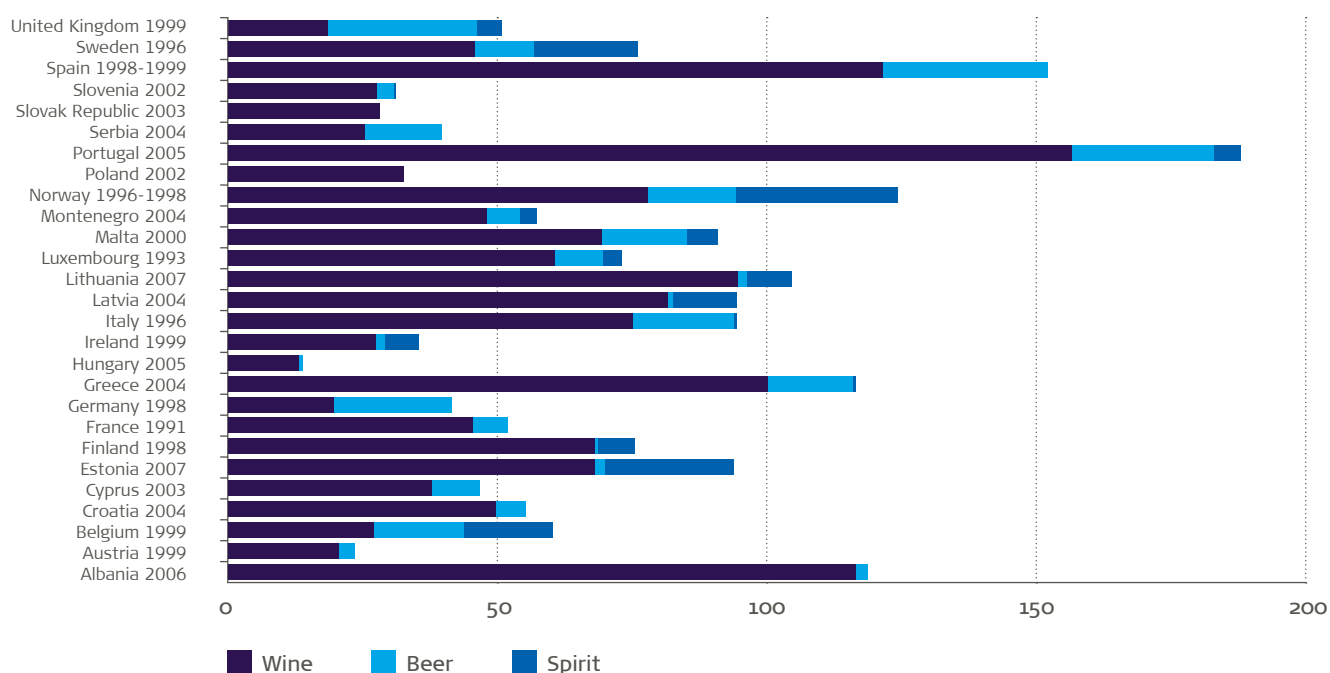
Map 5

# Average availability of soft drinks in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)



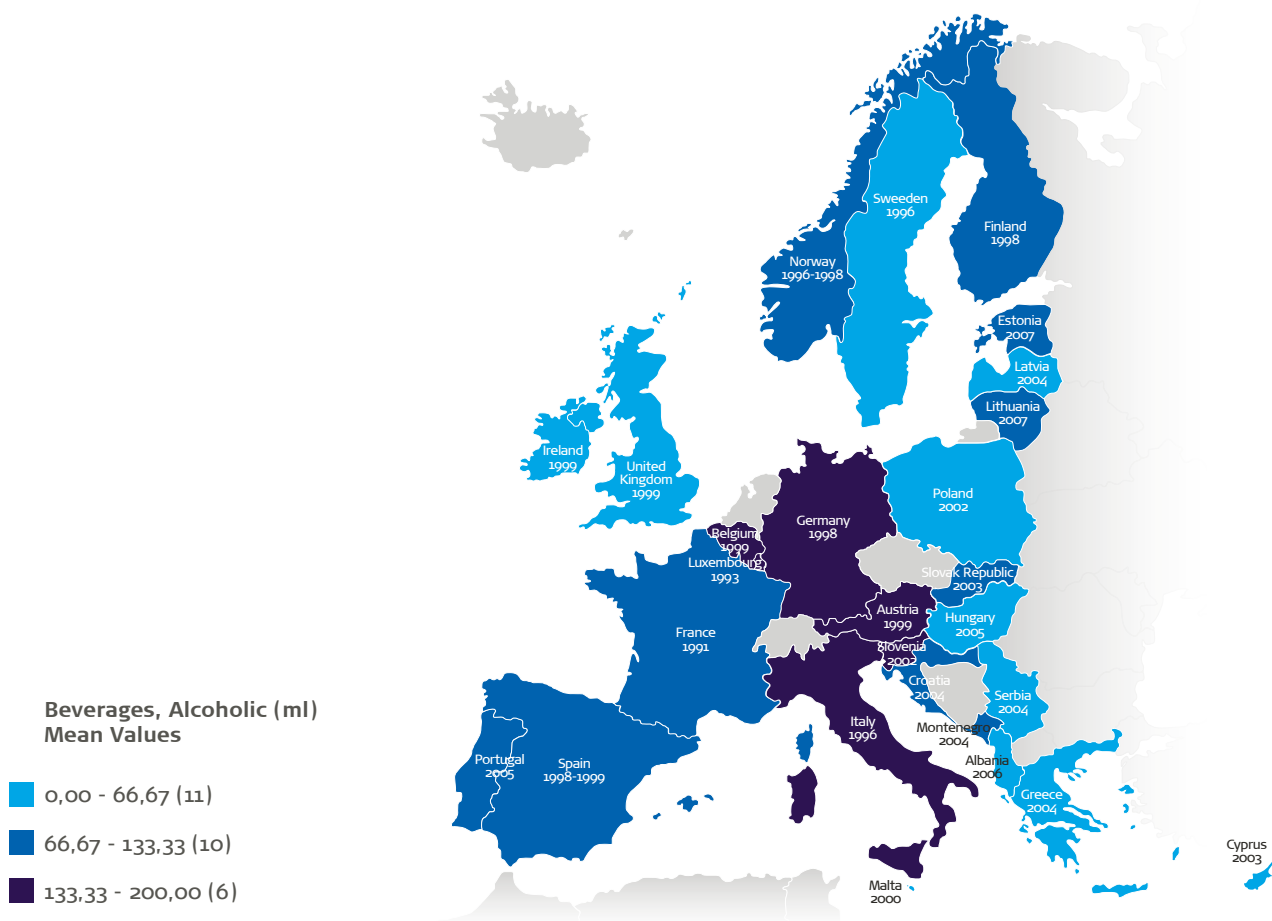
Graph 22

Average availability of alcoholic beverages in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)



Map 6

Average availability of alcoholic beverages in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)







## LIST OF GRAPHS AND MAPS

### Section A

#### Estonia

**Graph 1.** Change in mean food availability, from 2003 to 2007 (quantity/person/day)

**Graph 2.** Percent change in mean food availability, from 2003 to 2007 (quantity/person/day)

**Graph 3.** Average availability of four food groups, by year (g/person/day)

**Graph 4.** Mean availability of vegetables, fruit and juices, by educational level of the head of the household, in 2003 and 2007 (quantity/person/day)

#### Lithuania

**Graph 5.** Change in mean food availability, from 2003 to 2007 (quantity/person/day)

**Graph 6.** Percent change in mean food availability, from 2003 to 2007 (quantity/person/day)

**Graph 7.** Average availability of four food groups, by year (g/person/day)

**Graph 8.** Mean availability of vegetables, fruit and juices, by educational level of the head of the household, in 2003 and 2007 (quantity/person/day)

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**Graph 9.** Change in mean food availability, from 1990 to 2005 (quantity/person/day)

**Graph 10.** Percent change in mean food availability, from 1990 to 2005 (quantity/person/day)

**Graph 11.** Average availability of four food groups, by year (g/person/day)

**Graph 12.** Mean availability of vegetables, fruit and juices, by educational level of the head of the household, in 1990 and 2005 (quantity/person/day)

#### Estonia, Lithuania and Portugal

**Graph 13.** Average availability of main food groups (Meat, meat products and dishes; Fish and seafood; Milk and milk products; Added lipids) in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)

**Graph 14.** Average availability of main food groups (Vegetables; Fruit; Fruit and vegetable juices) in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)

**Graph 15.** Average availability of main food groups (Cereals; Potatoes; Pulses) in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)

**Graph 16.** Average availability of main food groups (Sugar and sugar products; Non alcoholic beverages; Alcoholic beverages) in Estonia, Lithuania and Portugal in 2005 (quantity/person/day)

### Section B

#### Europe

**Graph 17.** Average availability of vegetables (fresh and processed) and fruit (fresh and processed) in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Map 1.** Availability of juices (fruit and vegetable) in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)

**Graph 18.** Average availability of meat, meat products and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Map 2.** Availability of meat, meat products and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Graph 19.** Average availability of fish, seafood and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Map 3.** Availability of fish, seafood and dishes in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Graph 20.** Average availability of added lipids of animal and vegetable origin in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Map 4.** Average availability of olive oil in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)

**Graph 21.** Average availability of sugar and sugar products in DAFNE-ANEMOS countries in the most recent survey year available (g/person/day)

**Map 5.** Average availability of soft drinks in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)

**Graph 22.** Average availability of alcoholic beverages in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)

**Map 6.** Average availability of alcoholic beverages in DAFNE-ANEMOS countries in the most recent survey year available (ml/person/day)

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