

Network

for the **Pan-European
Food Data Bank**

based on

**Household Budget
Surveys**



Supported by the European Commission through the
Health Monitoring Programme of DG-SANCO

DAFNE III
Data Food Networking



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Introduction

Scientific evidence has been accumulated supporting the role of nutrition in the risk of developing cardiovascular disease and cancer, the two leading causes of premature death in developed countries. The first lines of evidence come from comparisons of dietary and disease patterns in large population groups. Early efforts on documenting dietary patterns have focused on identifying the specific nutrients that may be responsible for effects on people's health, but recent research has expanded towards comparing patterns of food intake.

The food data used for international comparisons most often derive from: a) the food balance sheets, providing information on food supply at the population level b) household budget surveys, which collect data on food availability within a nationally representative sample of households and c) specifically designed individual nutrition surveys, providing information on the food intake of free-living individuals, over a specified time period. The food balance sheet data are useful when conducting comparisons on the adequacy of food supply and for following crude dietary changes over time. The individual surveys, when food intakes of the participants are recorded as adequately as possible, are expected to provide evidence on the food quantities consumed. Nevertheless, when international comparisons are undertaken, differences in the study design and analysis of the various surveys reduce the comparability of the results.

Comparable between countries information on food availability can also be provided by data collected in the household budget surveys (HBS). Like food balance sheets, the HBSs allow between country comparisons on a regular basis but, moving from the total population to the household level, the HBSs can provide a more detailed description of the dietary choices of the population, as well as of population sub-groups.

In Europe, there is a need for a dietary ascertainment tool that would provide a continuous and comparable flow of information. The multipurpose HBSs are routinely undertaken by the statistical offices of almost all European countries, using nationally representative samples and with a methodology which allows for between countries comparisons. Hence, the HBS data could help identify issues such as differences concerning dietary patterns, high risk population groups on account of

their nutritional habits, associations between diet and morbidity/mortality data, and the dietary intake of additives and contaminants. It should however be noted that the HBS data refer to foods available at household level and that no indication is given on what each member of the household consumes. Furthermore, information on meals taken outside the household is frequently aggregated and limited to expenses incurred.

Bearing the above conditions in mind, utilisation of HBS data can be important for the nutritional and agricultural strategy planning at regional, national and international level. The potential of the HBS data is further reinforced by the fact that these surveys constitute an affordable alternative to countries, with economies not robust enough to undertake specially designed nutrition surveys on a regular basis.

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The DAFNE Initiative

The DAFNE Initiative

The Data Food Networking (DAFNE) initiative aims at creating a cost-effective European databank, based on the food, socio-economic and demographic data collected through the nationally representative HBSs.

Since 1987, the DAFNE coordinating centre in Athens - Greece has organised a series of workshops, seminars and pilot research projects aiming at the development of the most appropriate way of using food and related data from HBSs. In mid nineties, this approach was granted financial support by the European Commission through the Cooperation in Science and Technology with Central and Eastern European Countries (the DAFNE I project) and the Agriculture and Agro-Industry, including Fisheries Programme - AIR (the DAFNE II project). The outcome of the first two projects was the methodology for rendering the European HBS food and socio-economic data comparable and the consequent development of a food database with information for 10 European counties (Belgium, Germany, Greece, Hungary, Ireland, Luxembourg, Norway, Poland, Spain and the United Kingdom).

In an attempt to better understand the limitations of the HBS data and how these should be dealt with, the work subsequently undertaken by the DAFNE group aimed at comparing HBS data, retrieved from the DAFNE database, with data from individual surveys (project supported through the Agriculture and Fisheries Programme - FAIR). Comparisons of the two sets of dietary data for 4 European countries (Belgium, Greece, Norway and the United Kingdom) showed the compatibility of the household budget and individual nutrition surveys. Analyses took into consideration limitations inherent in both methods.

The DAFNE III project was supported by the Health Monitoring Programme of DG-SANCO. The project aimed at the enlargement of the DAFNE database both in terms of partnership, France, Italy and Portugal were added to the list of DAFNE countries, and in terms of volume of information stored. Datasets collected in different time periods in each country were added, resulting in a food database which currently includes 45 surveys that cover the last 20 years in nine countries (Belgium, France, Greece, Ireland, Italy, Norway, Portugal, Spain and the United Kingdom). The newly developed DAFNE databank serves as a tool for monitoring food habits among European countries, by following overtime trends and their socio-demographic determinants. The databank will

be integrated in the European Union Public Health Information Network (EUPHIN) of the European Commission; while it has already been integrated in *DafneSoft*, a software tool that allows retrieving DAFNE data at various levels of detail and further present them in the form of maps, bar and pie charts (*DafneSoft* can be freely downloaded at www.nut.uoa.gr).

Results from the recently concluded DAFNE III project are summarised in the present publication.

Lately, the DAFNE initiative was granted support from DG-SANCO, in order to further expand the DAFNE database by including data from Austria, Finland and Sweden and recent data collected in Germany and Portugal (the DAFNE IV project). Furthermore, the current DAFNE project will further address methodological issues related to the estimation of nutrient availability at household level and to how the HBS food data can be supplemented with information on meals consumed outside the household.

The DAFNE Methodology

Incorporation of raw HBS data in the central database

The national datasets and their file descriptions were forwarded to the Athens centre. Data were read and the correct reading was evaluated through multiple cross-checks and tests of data consistency by standard procedures, including: a) the assessment of agreement between overlapping variables (e.g. age given in discrete years vs. age categorised in age groups), b) the cross-tabulation of variables with related content (e.g. the age of the household head compared to his/her employment status) and c) the identification of missing data for variables considered in the analysis. After completing the tasks described above, the raw data were stored and maintained in a Microsoft SQL Server 2000 DBMS on a Windows 2000 Server Operating System.

Study of the HBS data collection methodology

To assure national representativeness and feasibility of comparisons between countries, the methodology followed by the statistical offices when conducting their national HBSs was studied.

The HBS data used in the DAFNE III project and presented in this publication cover the period of 1980 – 2000 in nine European countries (Belgium, France, Greece, Ireland, Italy, Norway, Portugal, Spain and the United Kingdom). In each survey, multistage stratified random sampling was used to assure national representativeness and data collection was evenly distributed throughout the year to capture seasonal variation in food intake. The recording period has been set to 14 days, in the majority of the countries. All countries collected data on the households' expenses as well as information on the socio-economic characteristics of the household members. In Ireland and in two Belgian datasets, where food purchases are recorded in terms of expenses incurred and data on food quantities are limited, retail prices per unit weight were used to convert values into quantities.

Harmonisation of the food, demographic and socio-economic information

The DAFNE food classification scheme

The development of a food classification system that would allow international comparisons is a central element in the development of a European food databank. In this course of action, various issues had to be considered; the most prominent among

them referring to the variant level of detail in which HBS food data were recorded. The end result of this process is the DAFNE food classification scheme (page 10), which allows the classification of food data collected in different European countries into 56 detailed subgroups. These subgroups can be further aggregated at various levels ending up at 15 main food groups.

The DAFNE classification scheme for socio-demographic data

Though several socio-demographic characteristics are recorded in the HBSs and many of them are included in the final roster of variables to be studied, focus was put on the locality of the dwelling, on the educational status and occupation of the household head, and on the household's composition. The variables related to the above characteristics were identified in each dataset and were classified under common socio-demographic groups, formed through the establishment of operational criteria. Specific problems were addressed and between countries comparability was assured through iterative cross coding, several working group meetings and bilateral visits. More specifically:

• Locality

Using various criteria (e.g. population density, number of inhabitants or electors in the area where the household is located) the following three categories of locality were formed:

- Urban
- Semi-urban and
- Rural

The effect of locality on the households' food choices was not studied in the Greek HBS data since, for anonymity reasons, the Greek Statistical Office could not provide the variable information that would allow the classification under the above groups.

• Education of household head

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

- Illiterate / Elementary education not completed
- Elementary education completed
- Secondary education not completed
- Secondary education completed and
- College/University

Among the countries under study, data on the educational status of the household head and members were not routinely collected in the United Kingdom.

• Occupation of household head

Occupation reflects a number of characteristics including education, income and physical activity. If properly harmonised, it can provide a basis for comparing dietary

choices and practices. In the DAFNE project, occupation was classified under the four categories below, based on the occupational status and the profession, if employed, of the household head:

- Non-manual
- Manual
- Retired and
- Other

The last composite category presents several problems, as it mingles individuals with different activity levels and varying incomes. Methods of disaggregating it are being considered.

• **Household composition**

Though not frequently included in dietary analyses, household composition can have a considerable influence on nutritional choices. 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, the following eight categories were formed:

- 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
- Single elderly households and
- Households of two elderly residents

Calculation of the average, daily individual food availability

For each of the DAFNE countries, food availability per capita per day was calculated by dividing the household availability by the product of the referent time period and the mean household size. Following recommendation provided by the national data suppliers, weighting factors were incorporated in the formulae, whenever necessary, to accommodate the sampling scheme. The overall average availability (per person, per day) of the comparable food groups, as well as the average availability (per person, per day) for households belonging to different socio-demographic levels were calculated. It should finally be noted that individual availability was estimated without making allowances for the proportion of food that was edible.

The DAFNE food classification scheme

CEREALS AND CEREAL PRODUCTS

- Bread and rolls
- Rice and cereals
- Flour
- Pasta
- Cereal and bakery products (grains, flour and pasta excluded)

MEAT AND MEAT PRODUCTS

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 AND SEAFOOD

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

MILK AND MILK PRODUCTS

- Milk
- Cheese
- Milk products (milk and 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

PULSES

VEGETABLES

FRESH VEGETABLES

Green leafy vegetables

Cabbage

Tomatoes

Carrots

Onions and garlic

Other fresh vegetables

PROCESSED VEGETABLES

NUTS

FRUITS

FRESH FRUITS

Apples

Citrus

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

ALCOHOLIC BEVERAGES

Wine

Beer

Spirits

Results

Based on information retrieved from the DAFNE databank, the present publication provides the reader with only an essence of the abundance of the DAFNE data. In accordance to the main objective of the DAFNE III project, which was to follow trends in food availability in Europe, graphs were selected to illustrate changes in the availability of 14 main food groups, in each of the nine participating countries. These changes were estimated on the basis of the first and the last survey available in each country and are presented in horizontal bars.

Furthermore, the availability of four food groups of major public health interest (i.e. meat and meat products, vegetables, fruits and added lipids) is graphically presented, according to data collected in different time periods in each country. Thus, availability values (per person, per day) are based on three consecutive datasets from each of seven countries, while in France and Portugal two consecutive datasets per country were available. Out of these four food groups, one was selected in each country and its daily availability is indicatively presented according to the educational level of the household head. In the case of the United Kingdom, where education was not routinely collected, daily availability is presented according to the locality of the dwelling.

Based on the most recent national data, food choices are finally illustrated for added lipids (animal fat, vegetable fat, olive oil and seed oils), meat (red meat, poultry, offals and meat products), fruits and vegetables (fresh fruits, fresh vegetables, fruit and vegetable juices, processed fruits and processed vegetables). Lastly, maps are used to present disparities in the availability of cheese, milk and milk products (excluding cheese) in the European region.

With the exception of nuts and juices (fruit and vegetable), the availability of plant foods generally decreased or remained steady over time. The availability of nuts in particular, either increased substantially (Belgium), moderately (Greece, Norway, Ireland and the United Kingdom) or remained stable (France, Italy and Portugal). A North-South differentiation in the consumption of pulses was evident, since in Spain, Greece and Portugal the mean daily availability exceeded 10 g/person/day, while in North Europe values barely exceeded 1 g/person/day (data not shown). In all countries however, pulses availability decreased over time.

According to HBS data collected in late nineties, Greece recorded the highest vegetable

availability within the household (271 g/person/day) and Norway the lowest (109 g/person/day). For the remaining countries, vegetable availability varied between approximately 150 g/person/day (in the United Kingdom, Portugal and Ireland) and 180 g/person/day (in France and Italy). In recent years, vegetable availability was generally on the rise in Northern and Central Europe. Southern European countries, on the contrary, have recently recorded a reduction in household vegetable purchases, with the sole exception of Greek households which recorded an increase between 1987 and 1999. In general, vegetable consumers are of higher education and a notable increase in vegetable availability in Northern and Southern Europe was mainly observed for the trend-leading highly educated households. The case of Greece should however be considered, with vegetable availability being higher among households of elementary education, which, in addition, increased their vegetable availability between 1987-1999 more than their highly educated counterparts (data not shown).

In the case of fruits, all the Mediterranean countries clearly lead the way with daily availability exceeding the WHO recommendations of at least 2 portions (approximately 150 g) of fruit per day. Ireland and the United Kingdom are trailing with 101 g/person/day and 106 g/person/day, respectively. In all countries but Ireland, Norway and the United Kingdom however, fruit availability decreased with time. The highest fruit consumers were of college or university education and this pattern remained unchanged over the last 15 years, probably indicating the success of campaigns to increase fruit consumption among these population sub-groups. The availability of juices (mostly fruit juices) generally increased during the studied time period. However, the range of availability values was substantially large and varied between 1.6 ml/person/day in Portugal and 57 ml/person/day in Ireland. It should further be noted that in general, countries that were recorded as high fruit consumers reported low juice consumption.

Fruits, together with vegetables, are the two food groups most frequently mentioned for their beneficial attributes. Graphs in page 39, present the availability of different types of fruit and vegetables (fresh vs. processed) in the nine countries under study. Given current recommendations for at least 400 g (5 portions) of fruits and vegetables on a daily basis, all countries but Greece and Italy were remote from meeting this target. If we further consider that the presented values refer to food purchases, which are generally higher to actual intake, the deficit is more pronounced.

Various patterns were observed with respect to the daily individual availability of milk and milk products (including cheese, yoghurt, ice cream etc.). In late nineties, the highest availability values were recorded in Ireland (480 g/person/day) and Norway (386 g/person/day) and the lowest in Belgium (255 g/person/day). In terms of time trends, the daily availability increased in Belgium, France, Ireland and Portugal; only a

marginal increase was noted in Italy and a decrease in Greece, Norway, Spain and the United Kingdom. When cheese was separated from the group of milk and milk products (map presentations in page 40), an interesting pattern emerged. Countries consuming relatively higher quantities of cheese, like Belgium (55 g/person/day) and Greece (53 g/person/day), tended to consume relatively lower quantities of milk and other milk products (200 g/person/day and 246 g/person/day, for Belgium and Greece respectively). The highest milk and milk product availability (excluding cheese) was noted in Ireland (465 g/person/day), where consumption of cheese was rather low (15 g/person/day).

No large variations were observed in fish availability over time, with the exception of Greece and Portugal, where daily availability values increased during recent years by 5 and 10 g/person/day, respectively.

Based on data collected in late nineties, the lowest availability of meat and meat products was recorded in Norway (126 g/person/day) and the highest in Ireland (166 g/person/day). With respect to time trends, meat availability decreased in the studied time period, with the exception of Norway (+5 g/person/day), Portugal (+20 g/person/day) and Ireland (+33 g/person/day). In all countries but Portugal and Ireland, households whose head was of high educational level reported purchasing smaller amounts of meat and meat products.

When focus was put on four types of meat (red meat, poultry, offals and meat products), red meat was preferably consumed in all countries but Ireland and the United Kingdom (page 38). Greece was clearly identified as the highest consumer of red meat followed by Portugal, France and Italy. In Ireland, poultry and meat products were preferably consumed, the latter being also commonly consumed in Norway, Belgium and Spain. No clear pattern was observed in terms of meat preferences among the UK population.

The group of added lipids includes added fats (e.g. butter, margarine) and oils (olive oil and seed oils). In all countries, lipid availability either decreased or marginally increased (as is the case for Greece), with the most marked decrease being noted in Ireland (-21 g/person/day). As expected, the highest lipid availability was recorded in South Europe with olive oil corresponding to the highest proportion of the added lipid availability (79% in Greece, 67% in Spain and 56% in Italy). In Norway and Belgium, vegetable fats (mainly margarine) were the predominant lipid. In France and Portugal, seed oils were preferably consumed. In the United Kingdom, fats (of animal or vegetable origin) consisted 77% of the daily availability of added lipids. Lastly, in Ireland 80% of the added lipid availability was equally distributed between animal fats and seed oils (page 37).

The lack of information on meals and beverages consumed outside the household is expected to impair observations related to the intake of beverages (alcoholic and non-alcoholic). Bearing in mind that HBS values on beverages are only related to household consumption, a North-South differentiation could be observed on how their availability varied with time. The availability of alcoholic drinks within the household increased in Belgium, Greece, Norway, Ireland and the United Kingdom, while it decreased in France, Italy, Spain and Portugal. The availability of non-alcoholic beverages (including soft drinks, mineral water, coffee and tea) increased in France, Greece, Italy, Portugal and Spain over the studied time period.

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 DAFNE data presented in simple pictorial forms in this publication, document food disparities in nine European countries and how these changed during the last 20 years. In this sense, the DAFNE databank might be considered as a source of comparable, policy relevant and valid measures of food availability and can prove useful in multi-level monitoring and targeting.

Monitoring food availability in Europe (graphs and maps)

Explanatory note

In the graphs illustrating the availability of the selected food items the following abbreviations have been used:

BE: Belgium

ES: Spain

FR: France

GR: Greece

IRL: Ireland

IT: Italy

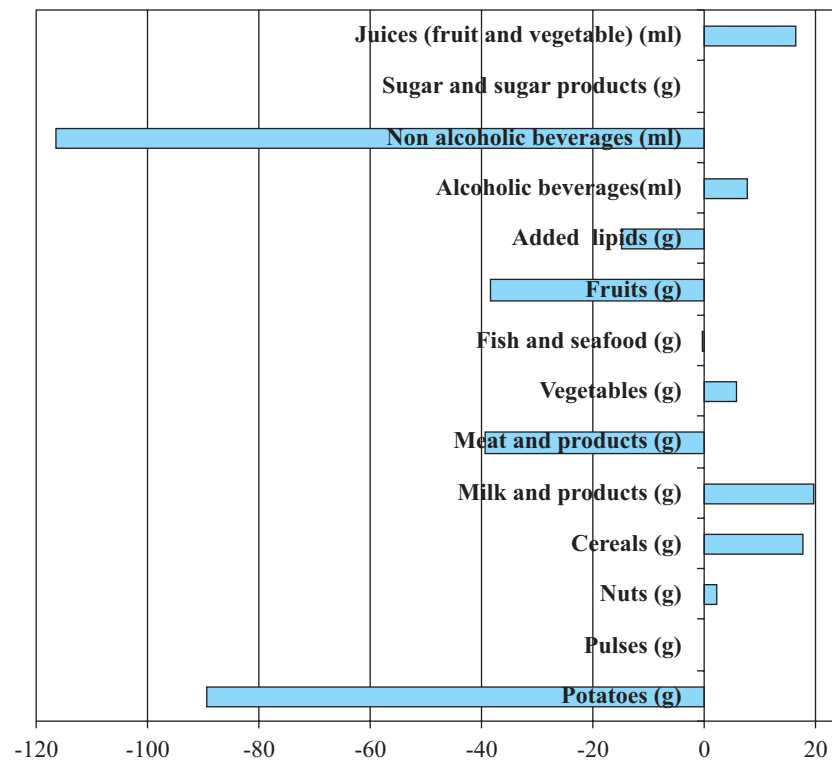
NW: Norway

PT: Portugal

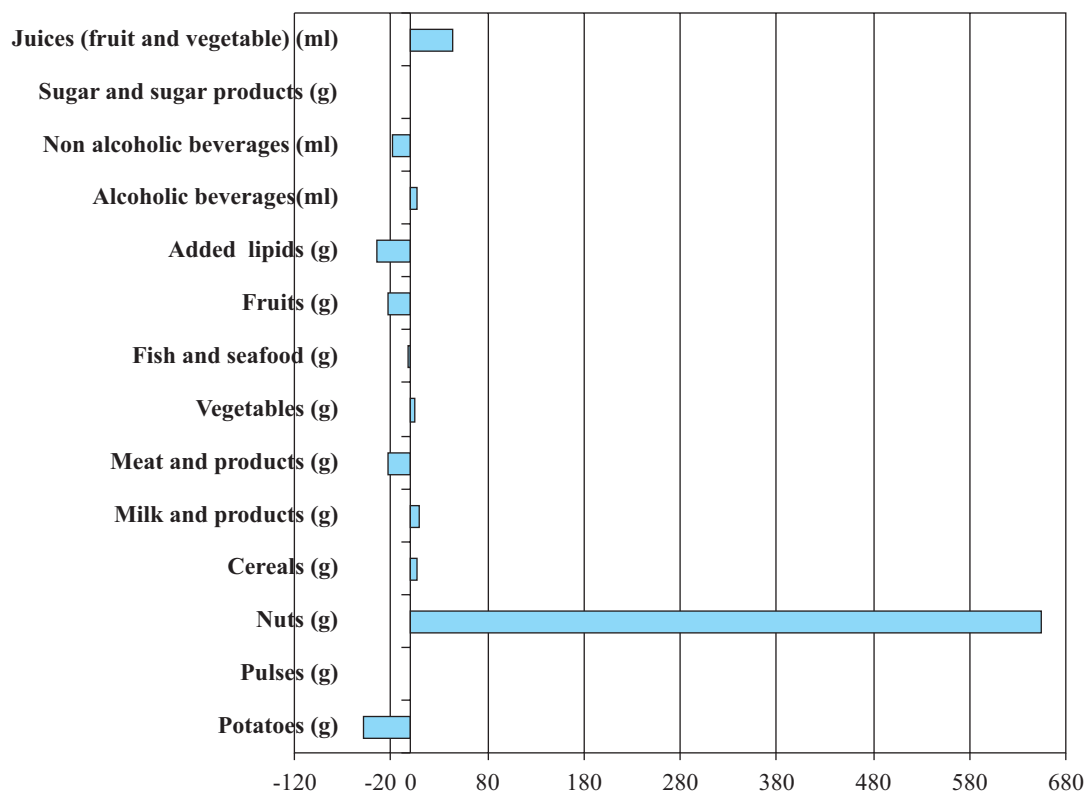
UK: United Kingdom



Change in mean food availability from 1987 to 1999 (quantity/person/day)

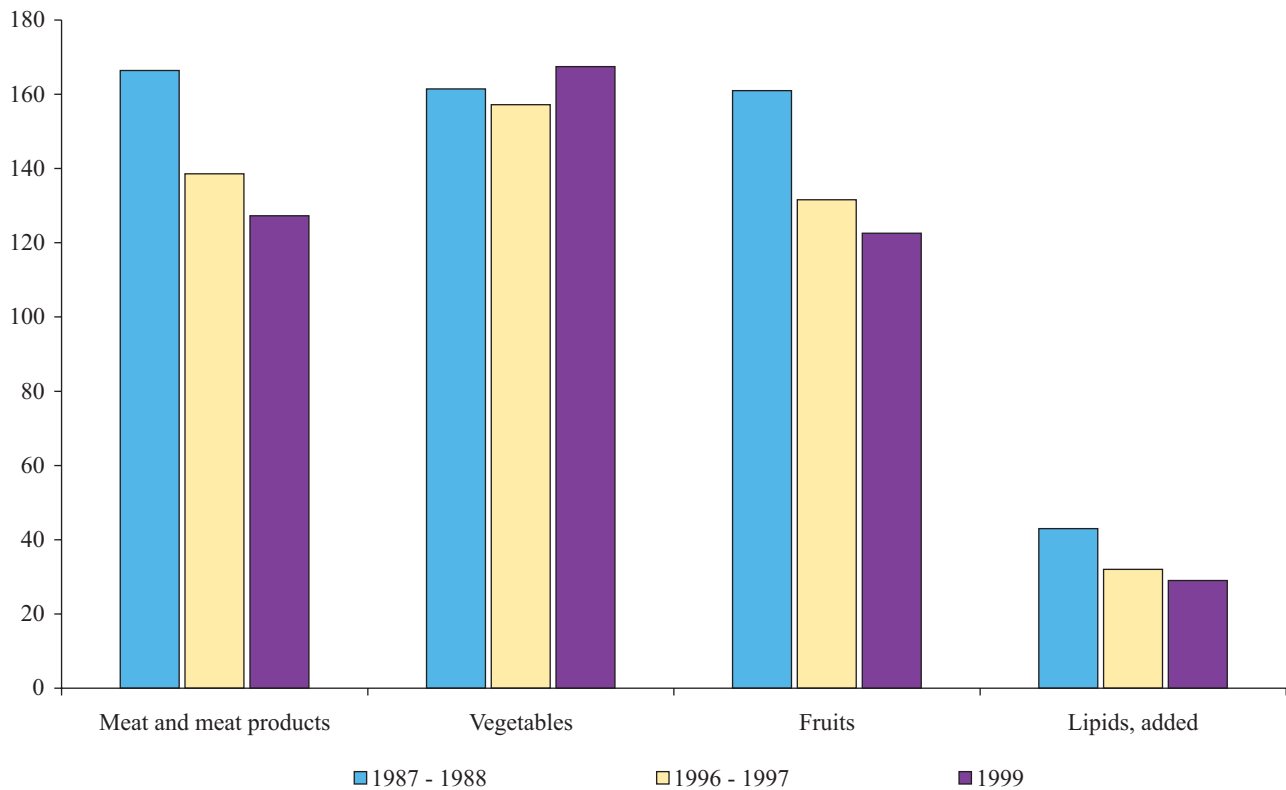


Percent change in mean food availability from 1987 to 1999 (quantity/person/day)

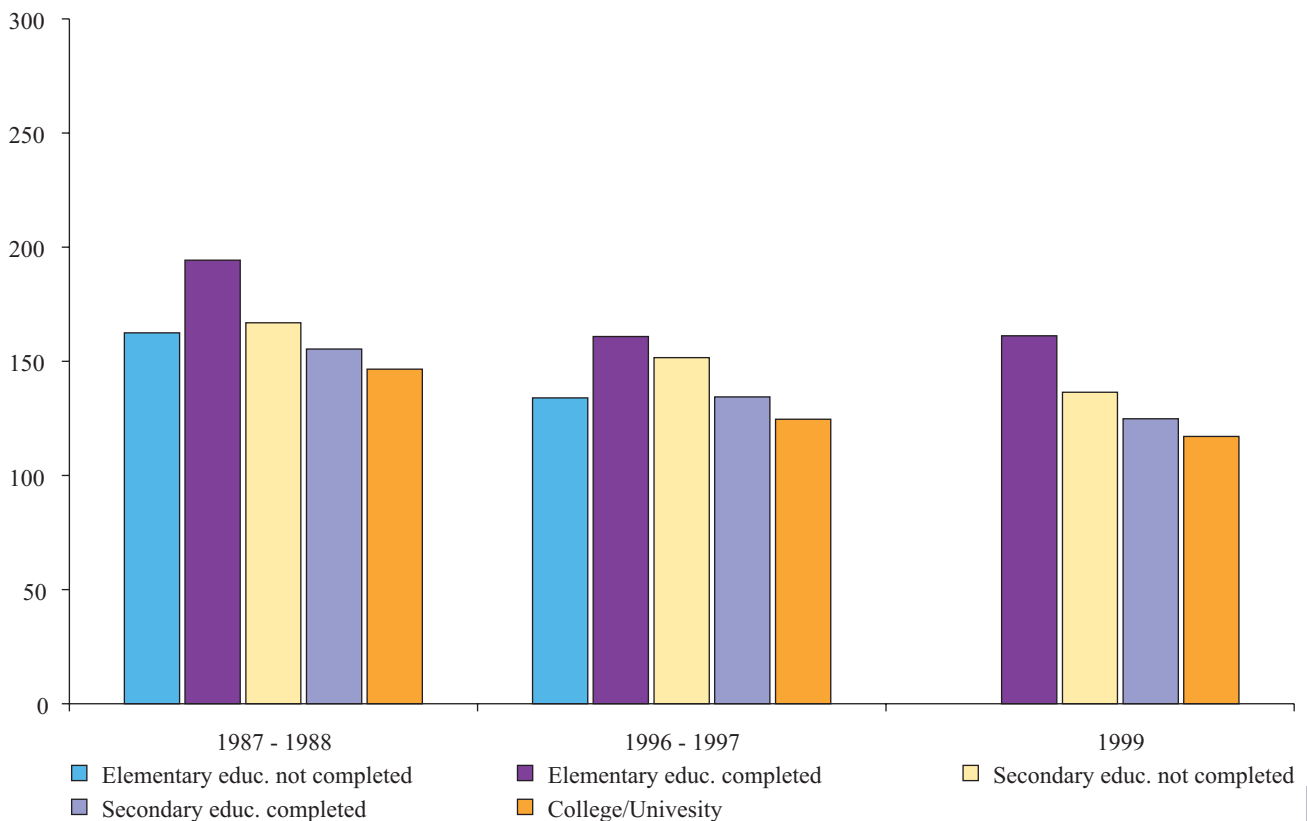




Average availability of four food groups, by year (g/person/day)

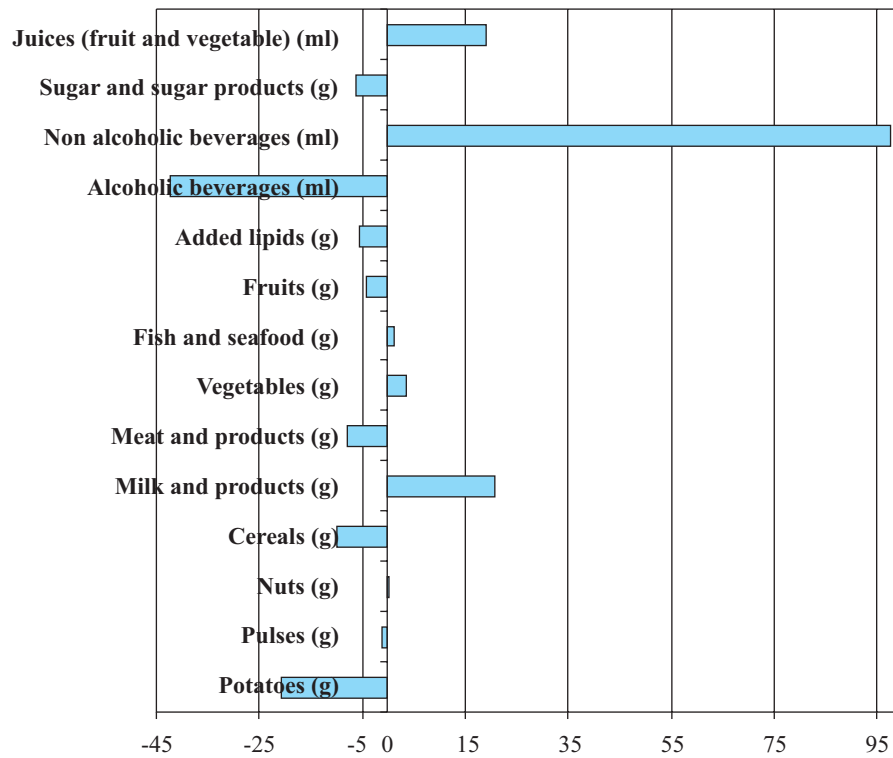


Mean daily individual availability of meat and meat products, by year and educational level of household head (g/person/day)

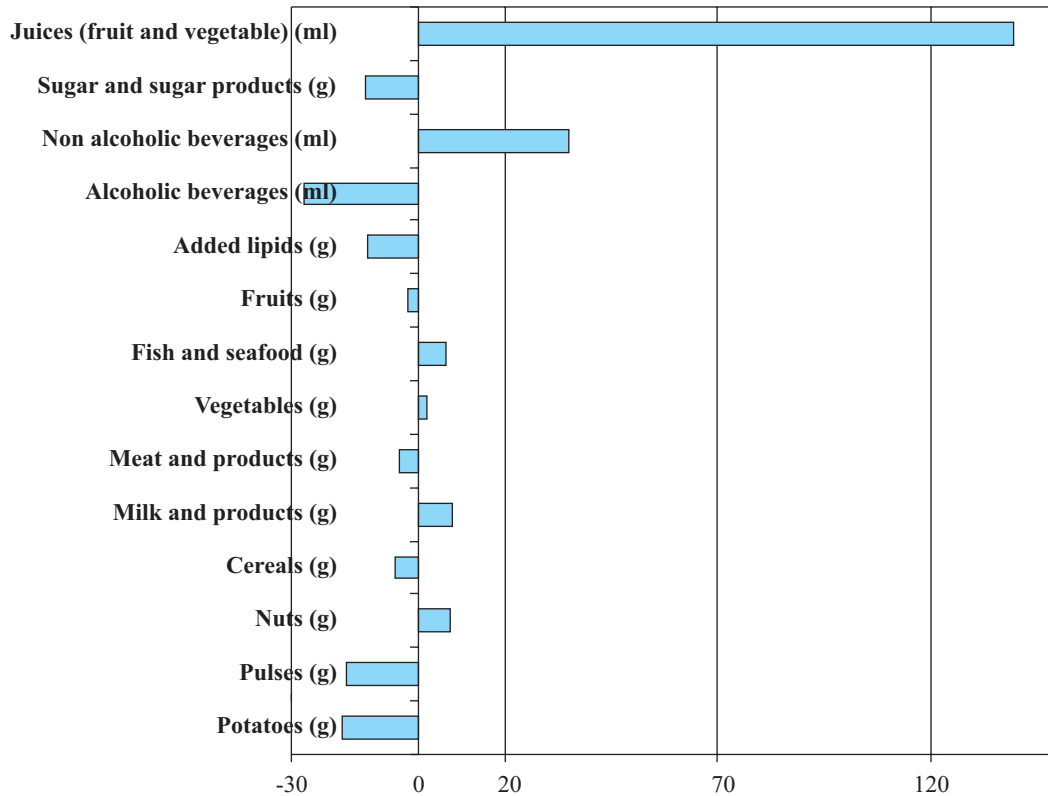




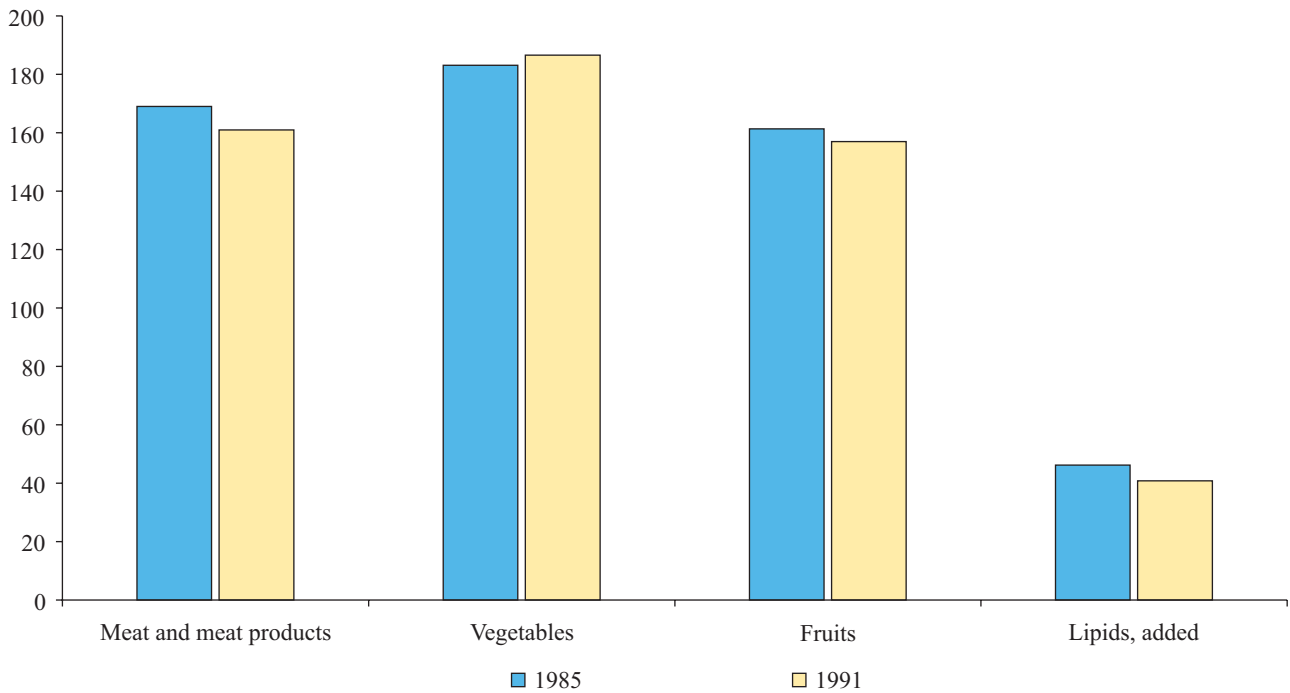
Change in mean food availability from 1985 to 1991
(quantity/person/day)



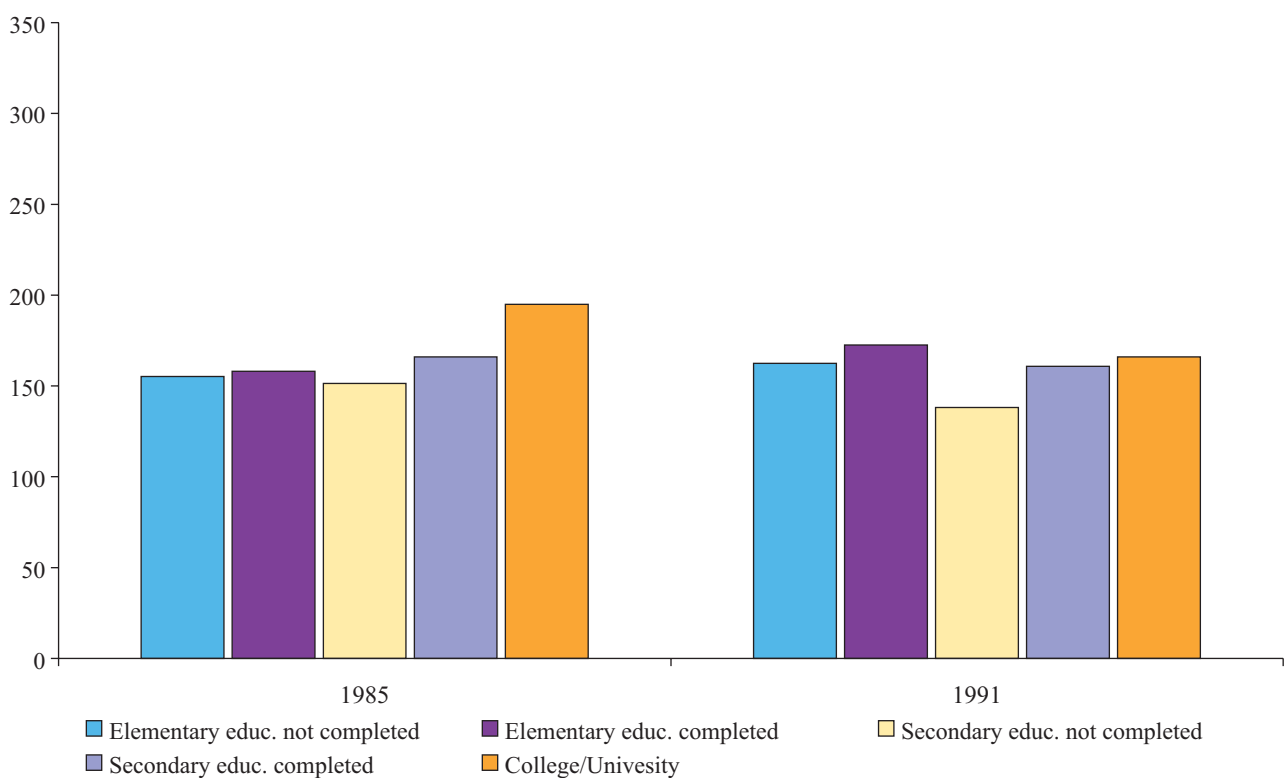
Percent change in mean food availability from 1985 to 1991
(quantity/person/day)



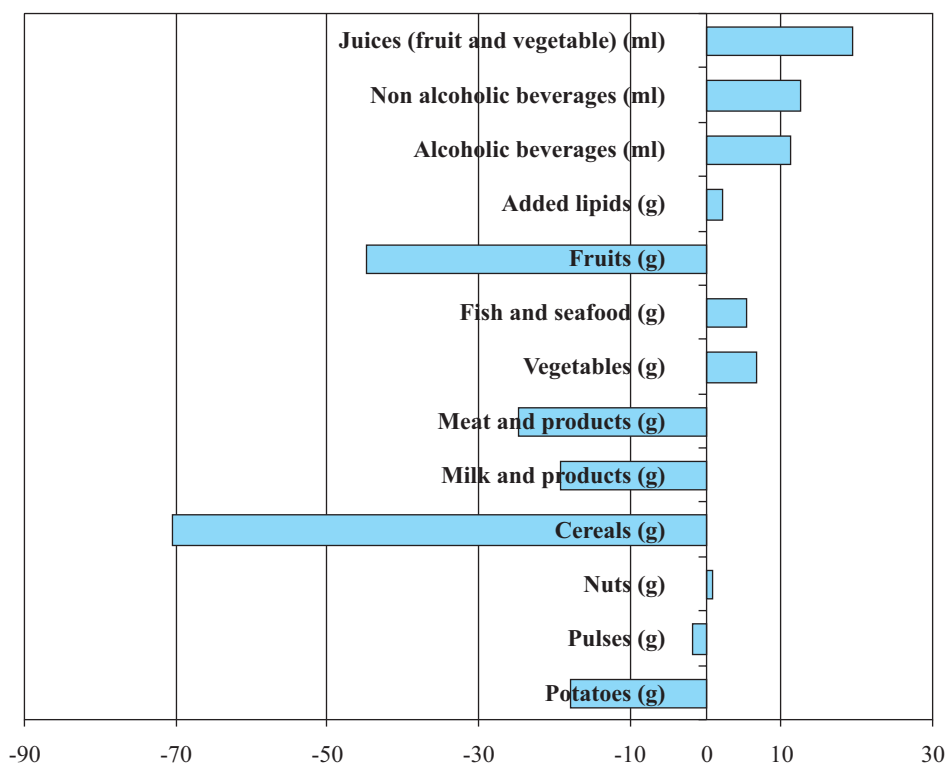
Average availability of four food groups, by year (g/person/day)



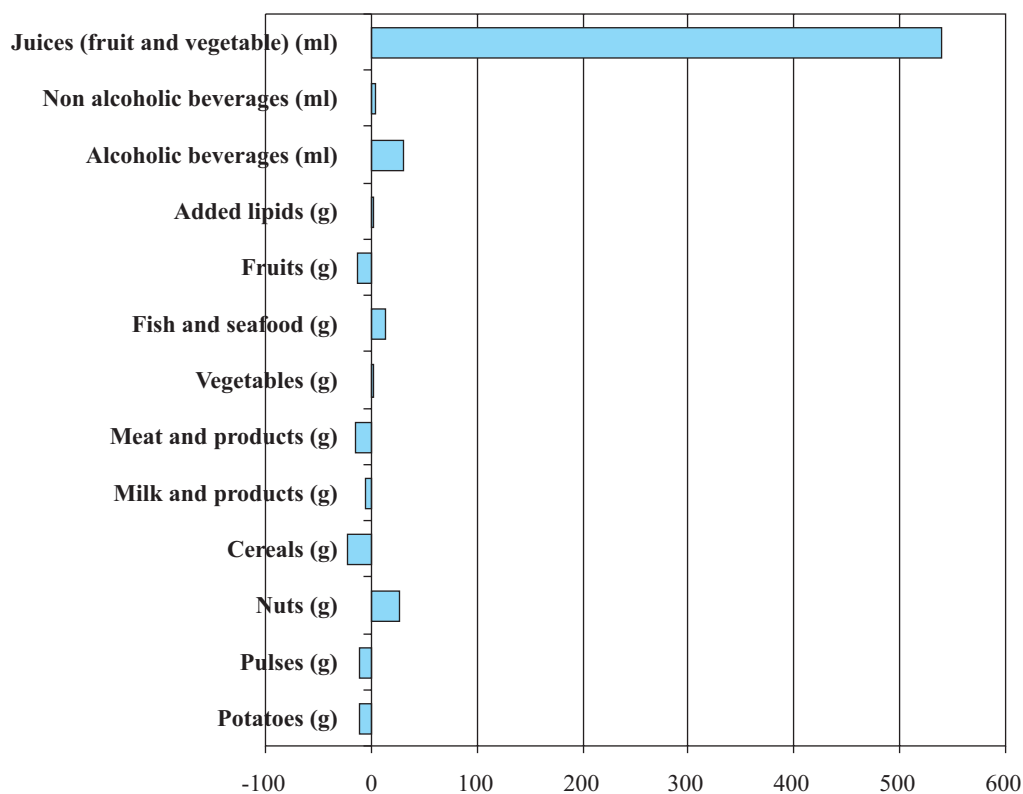
Mean daily individual availability of fruits, by year and educational level of household head (g/person/day)



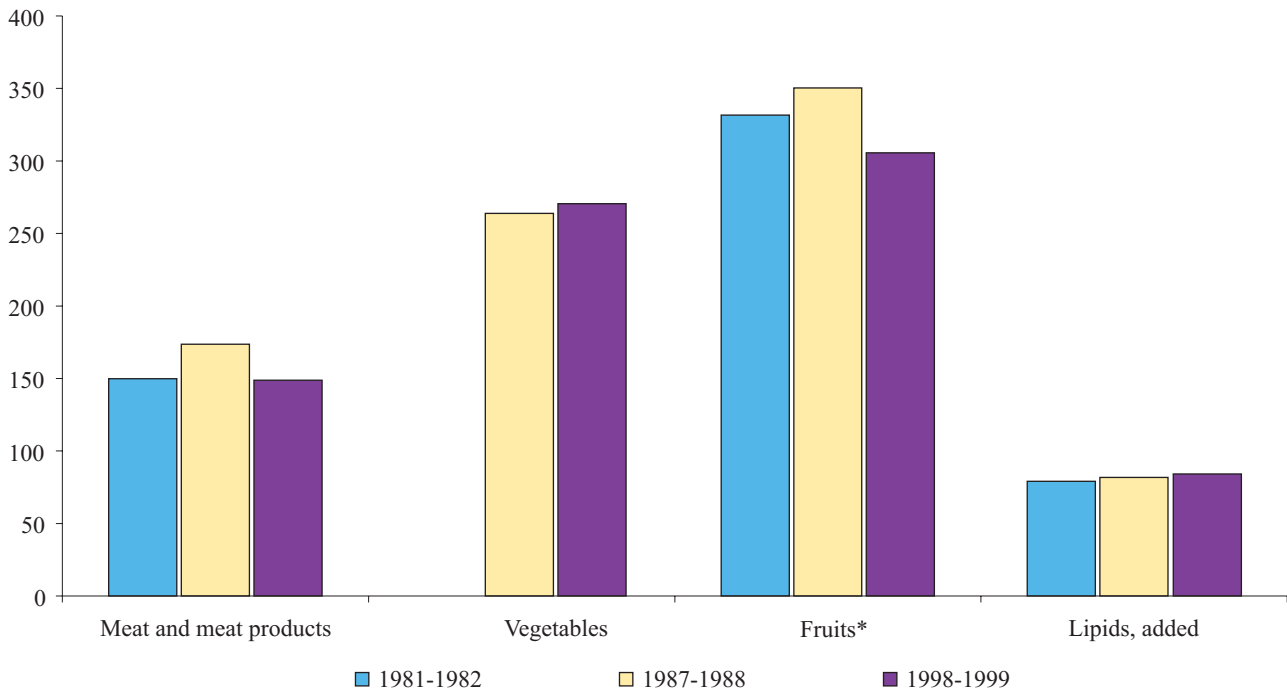
**Change in mean food availability from 1987 to 1999
(quantity/person/day)**



**Percent change in mean food availability from 1987 to 1999
(quantity/person/day)**

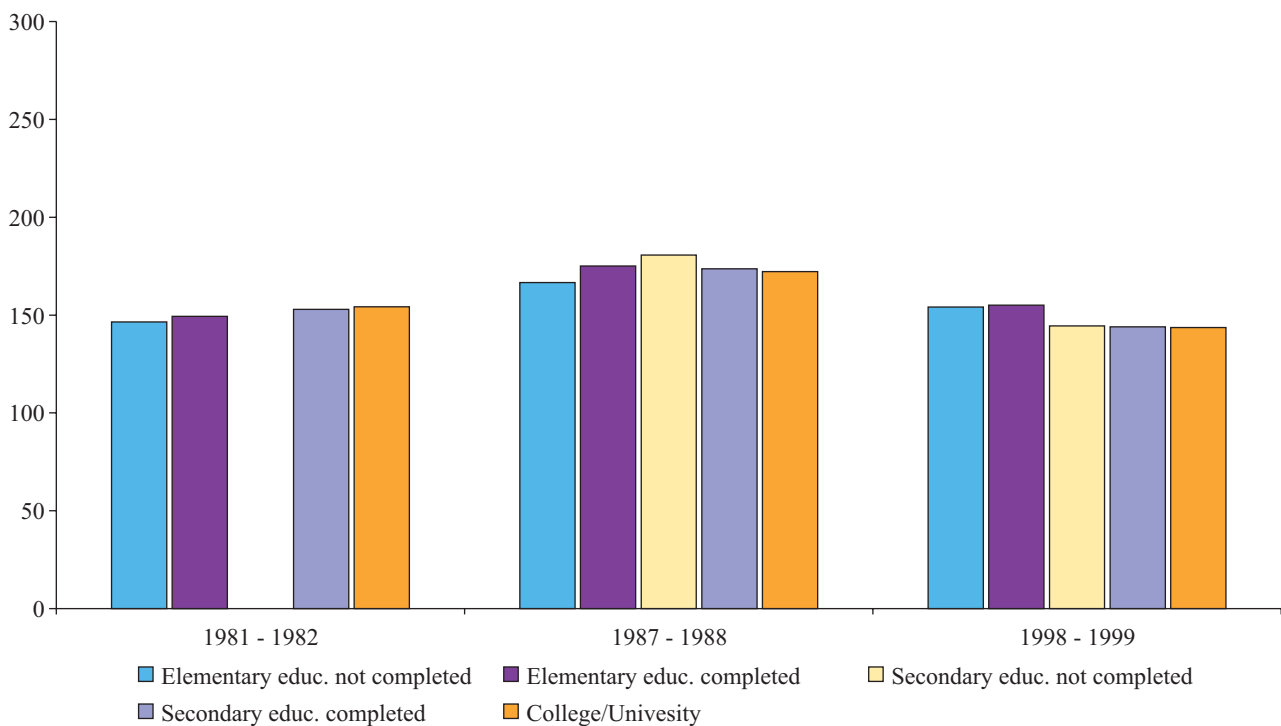


Average availability of four food groups, by year (g/person/day)



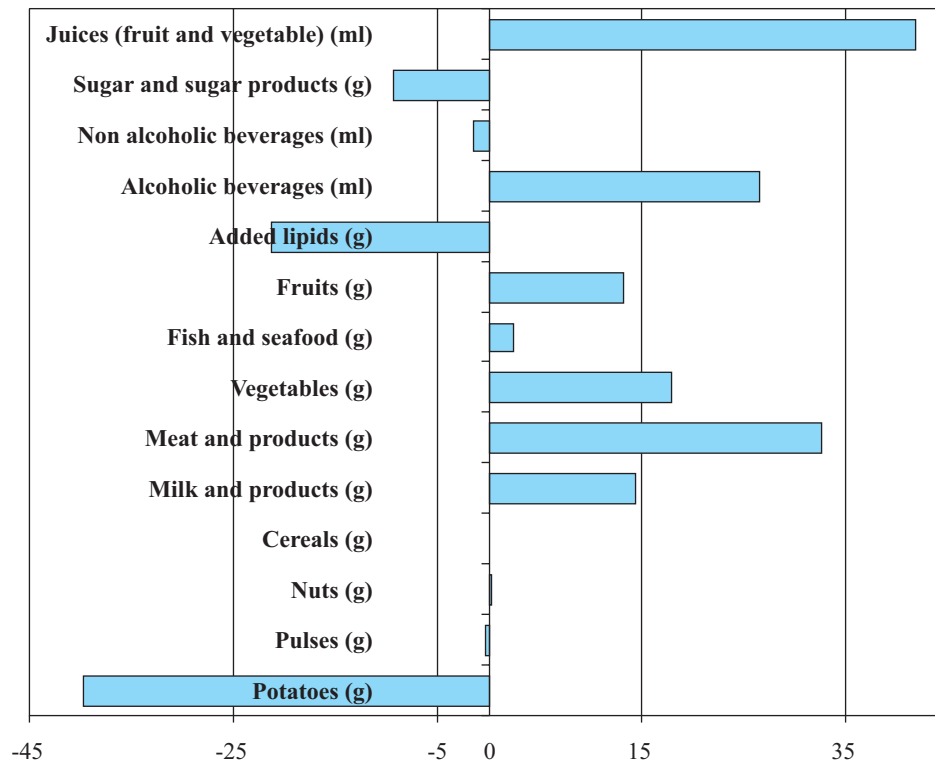
* In 1981-1982, data refer to fresh fruit availability only

Mean daily individual availability of meat and meat products, by year and educational level of the household head (g/person/day)

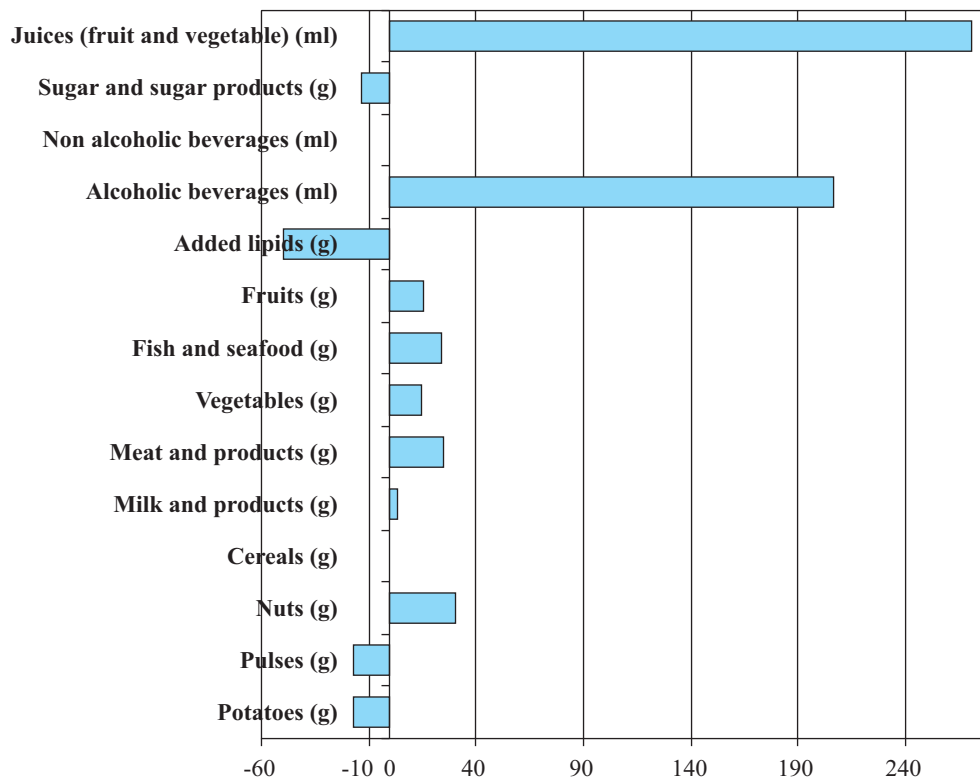




**Change in mean food availability from 1987 to 2000
(quantity/person/day)**

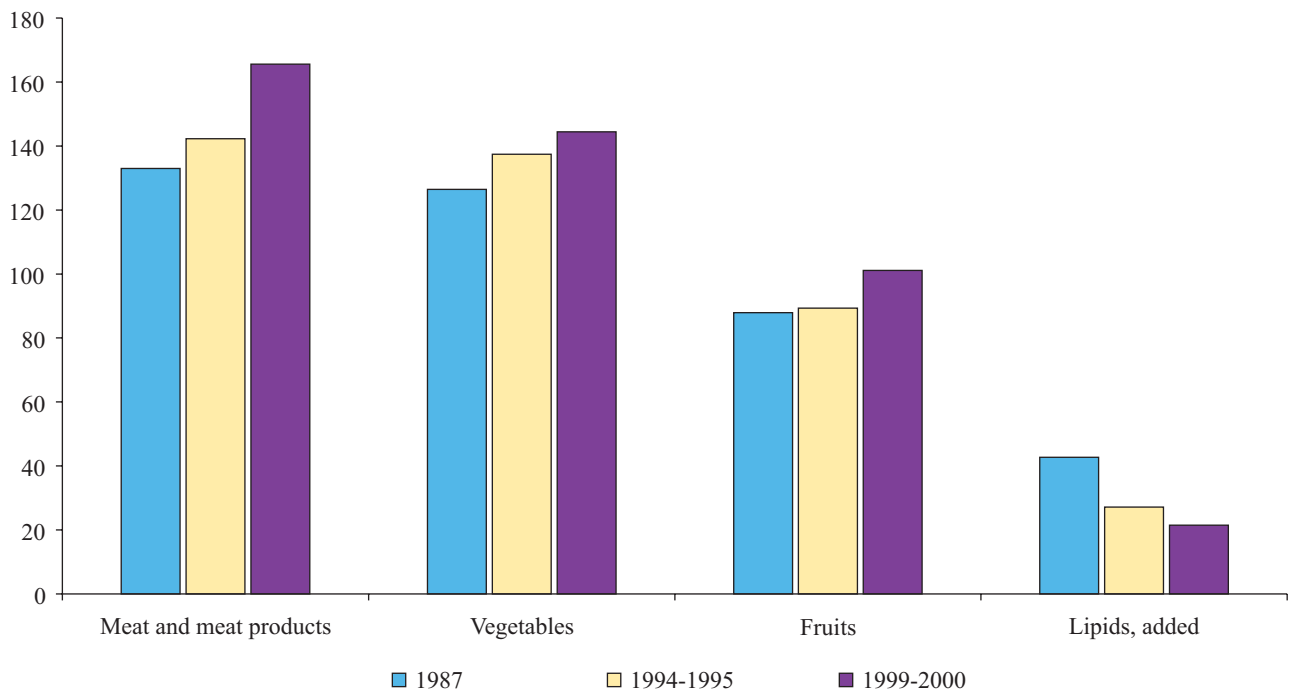


**Percent change in mean food availability from 1987 to 2000
(quantity/person/day)**

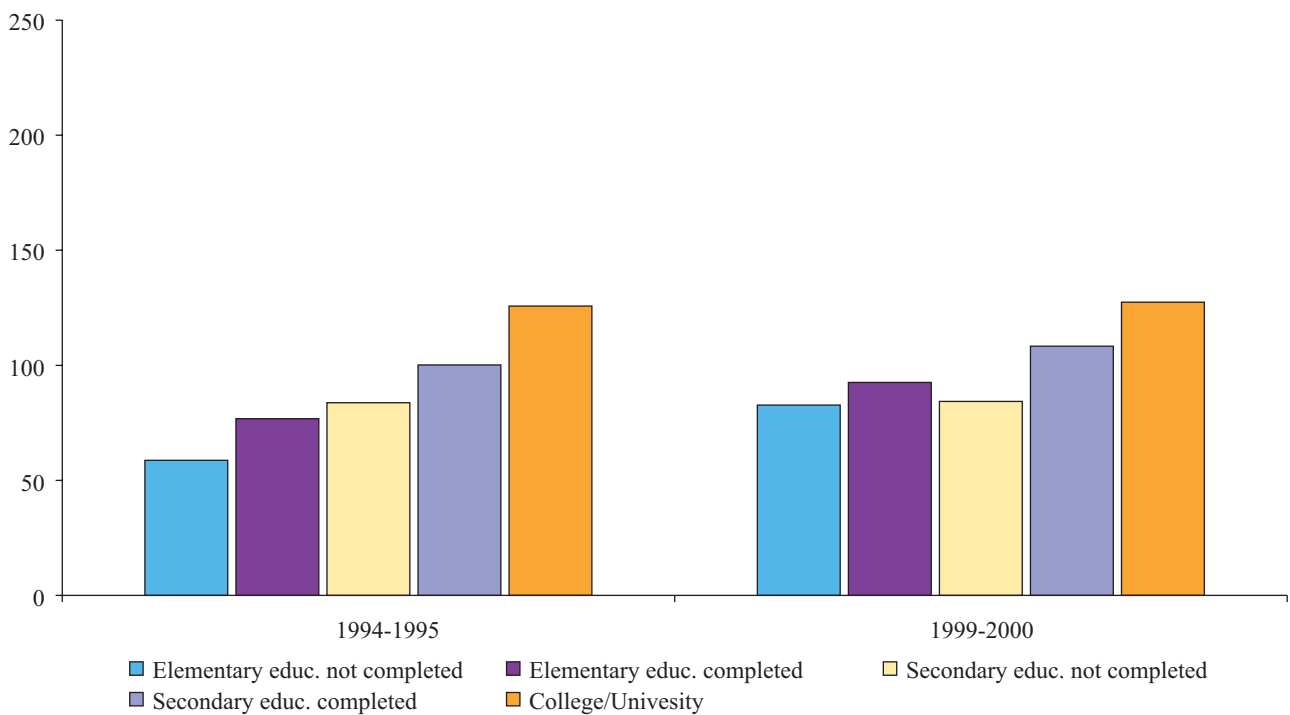




**Average availability of four food groups, by year
(g/person/day)**

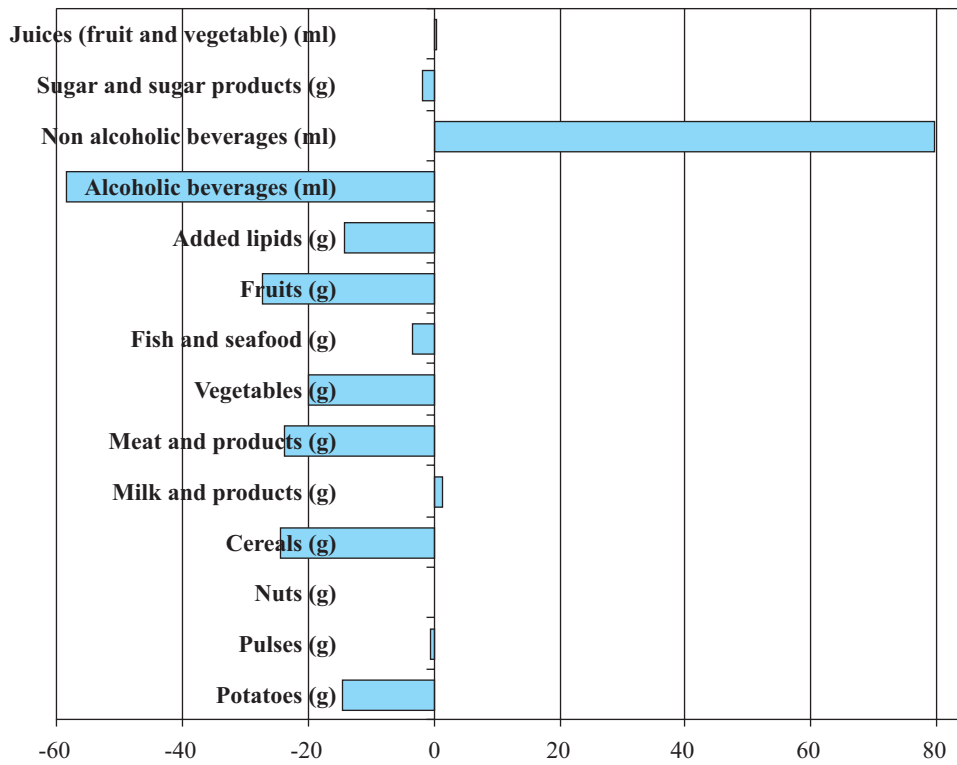


**Mean daily individual availability of fruits,
by year and educational level of household head (g/person/day)**

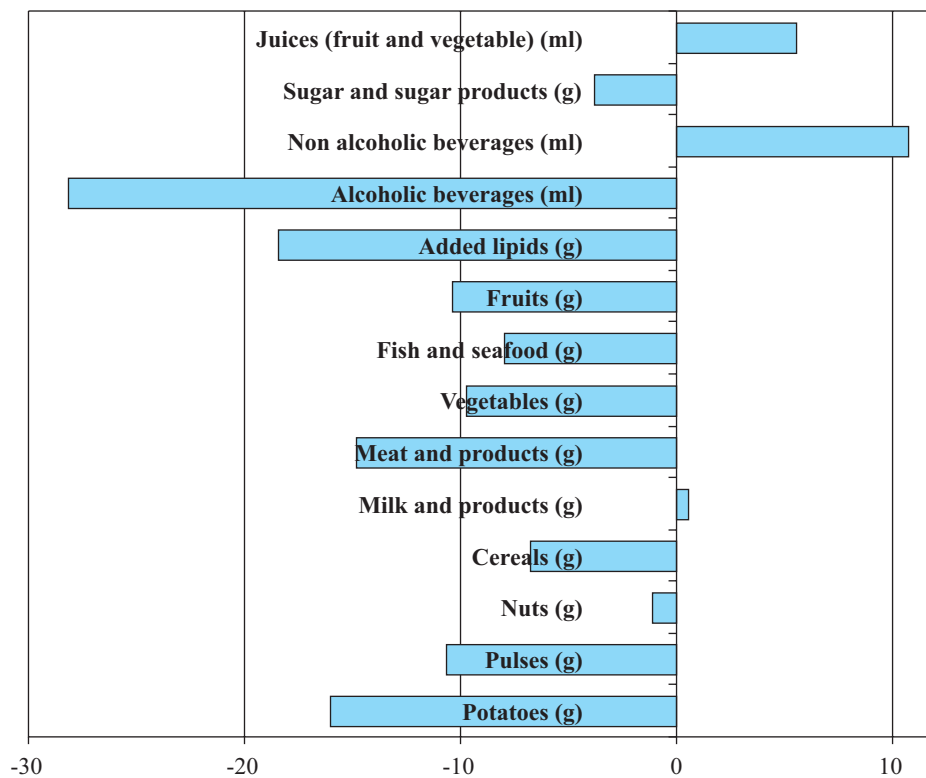




Change in mean food availability from 1990 to 1996
(quantity/person/day)

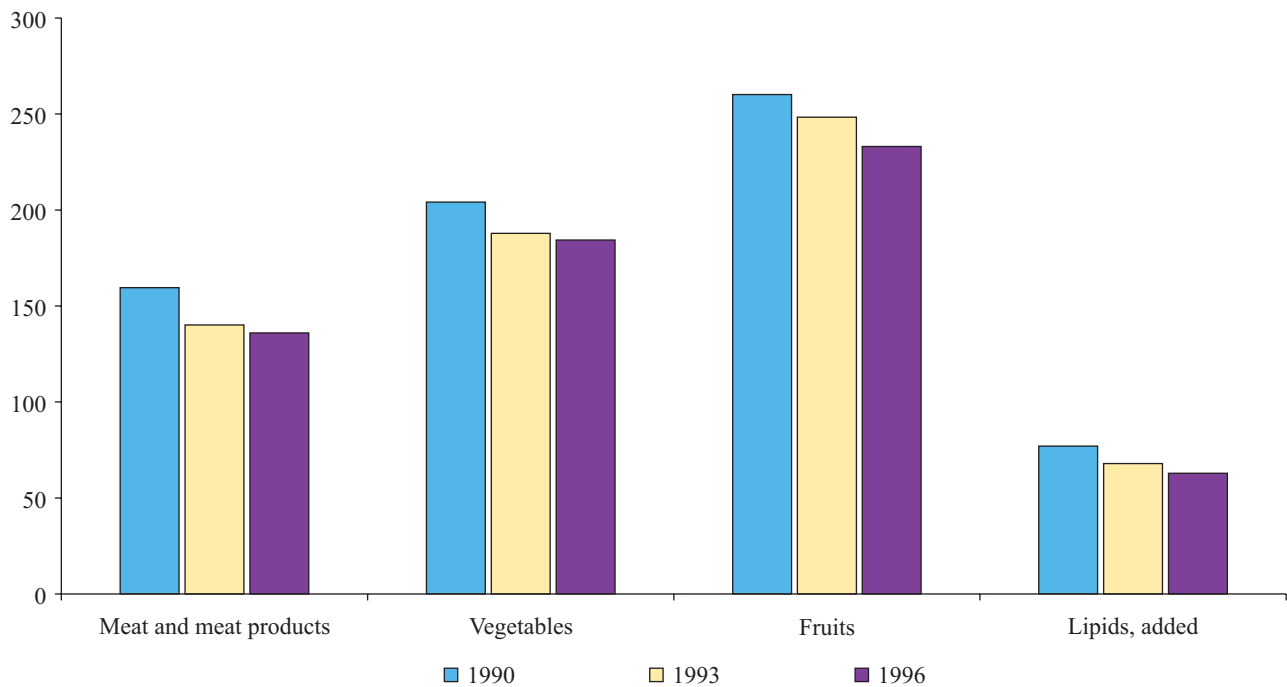


Percent change in mean food availability from 1990 to 1996
(quantity/person/day)

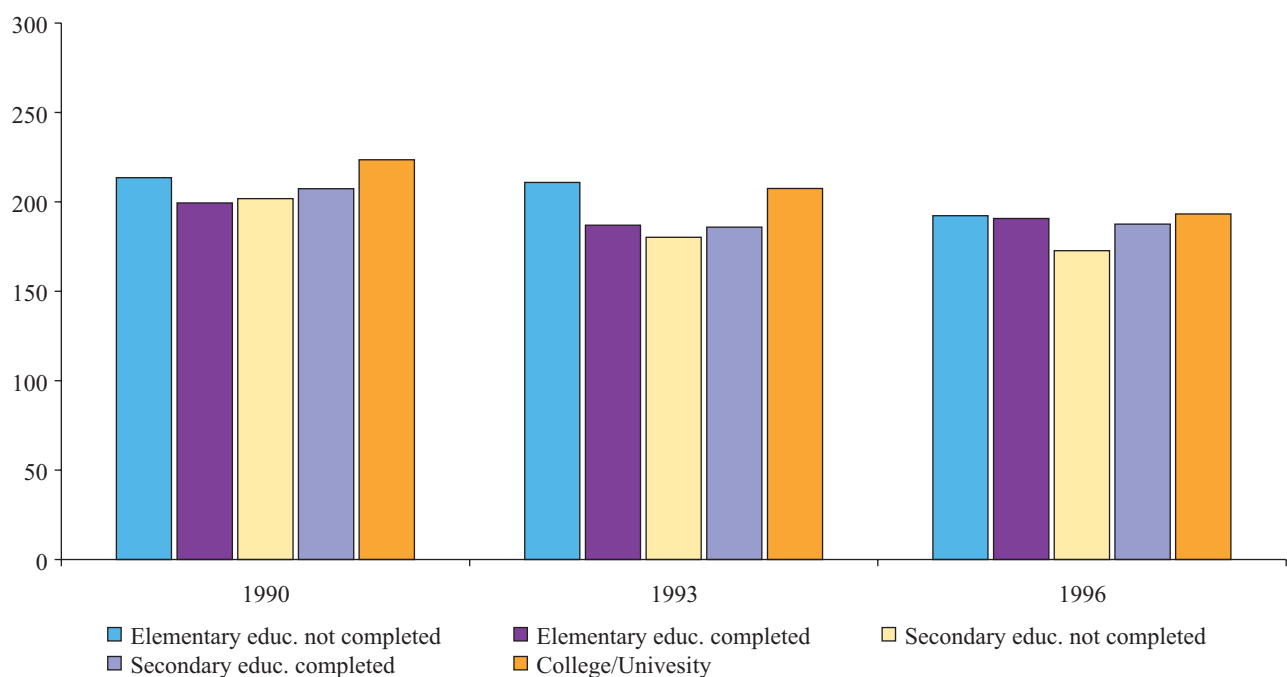




**Average availability of four food groups, by year
(g/person/day)**

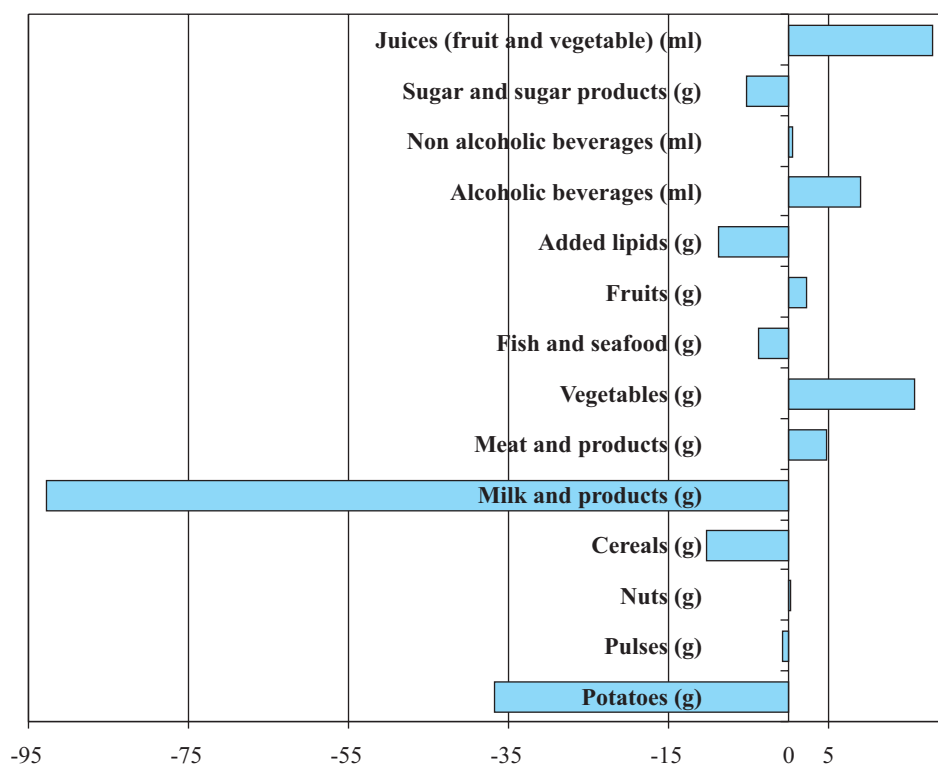


**Mean daily individual availability of vegetables,
by year and educational level of household head (g/person/day)**

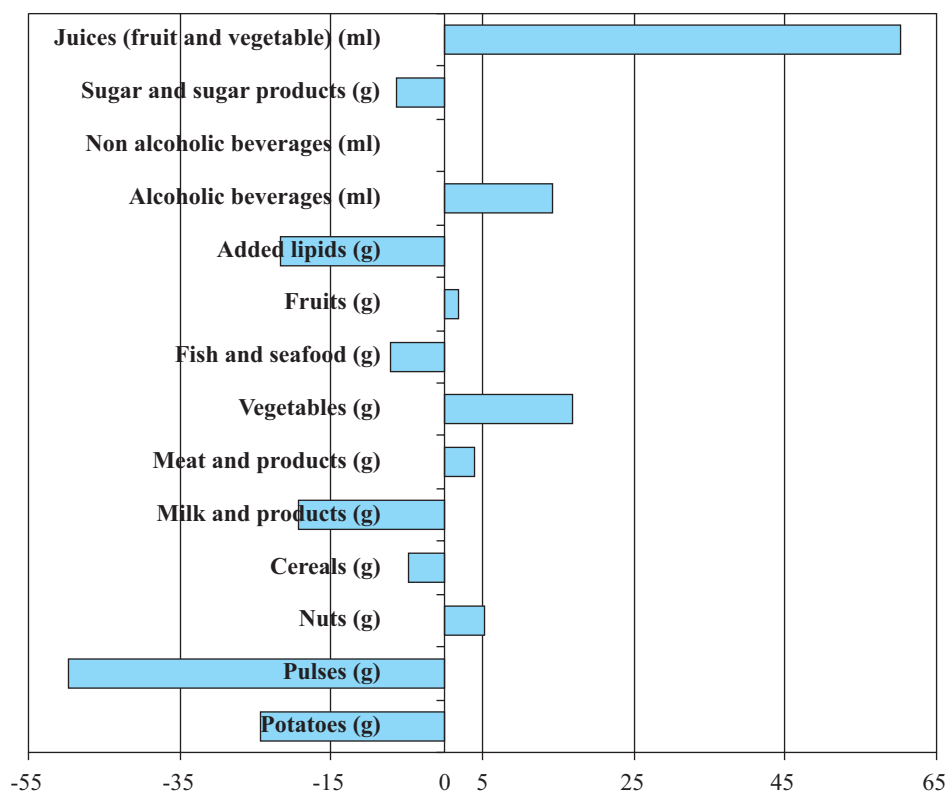




Change in mean food availability, from 1986 to 1998 (quantity/person/day)

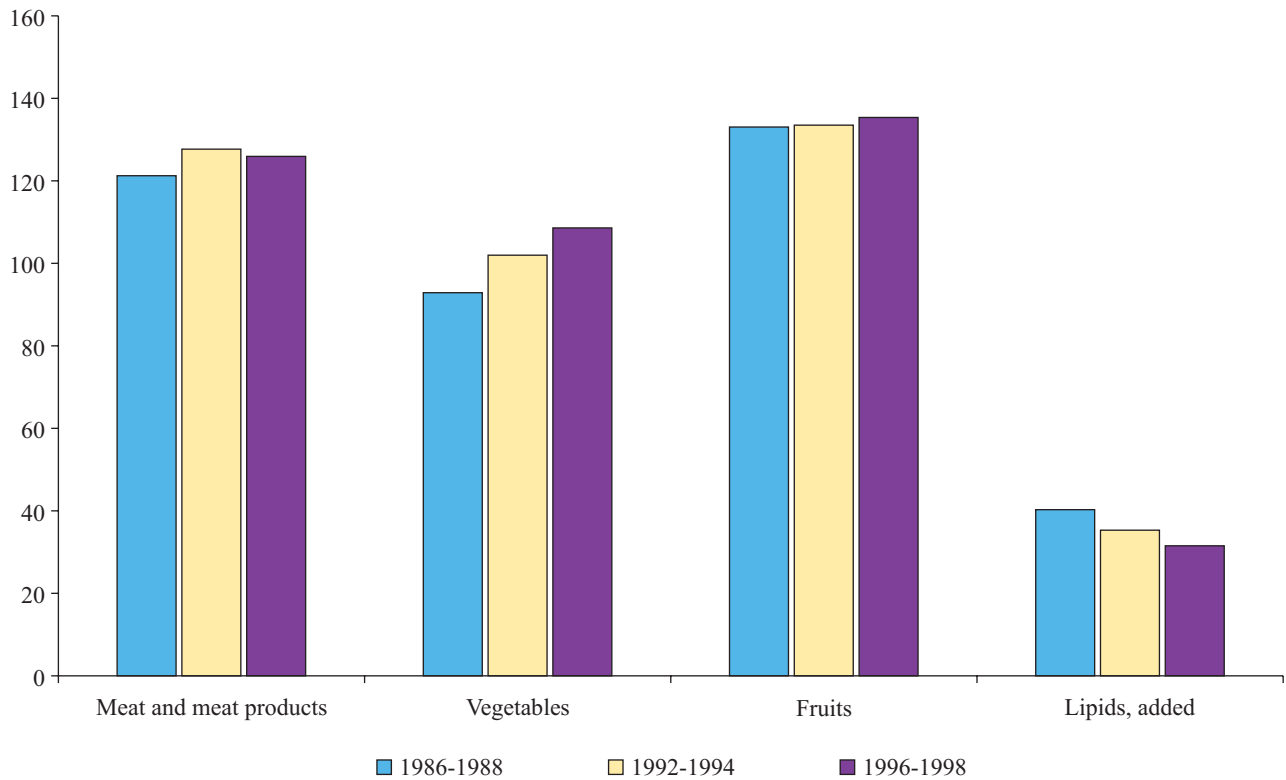


Percent change in mean food availability from 1986 to 1998 (quantity/person/day)

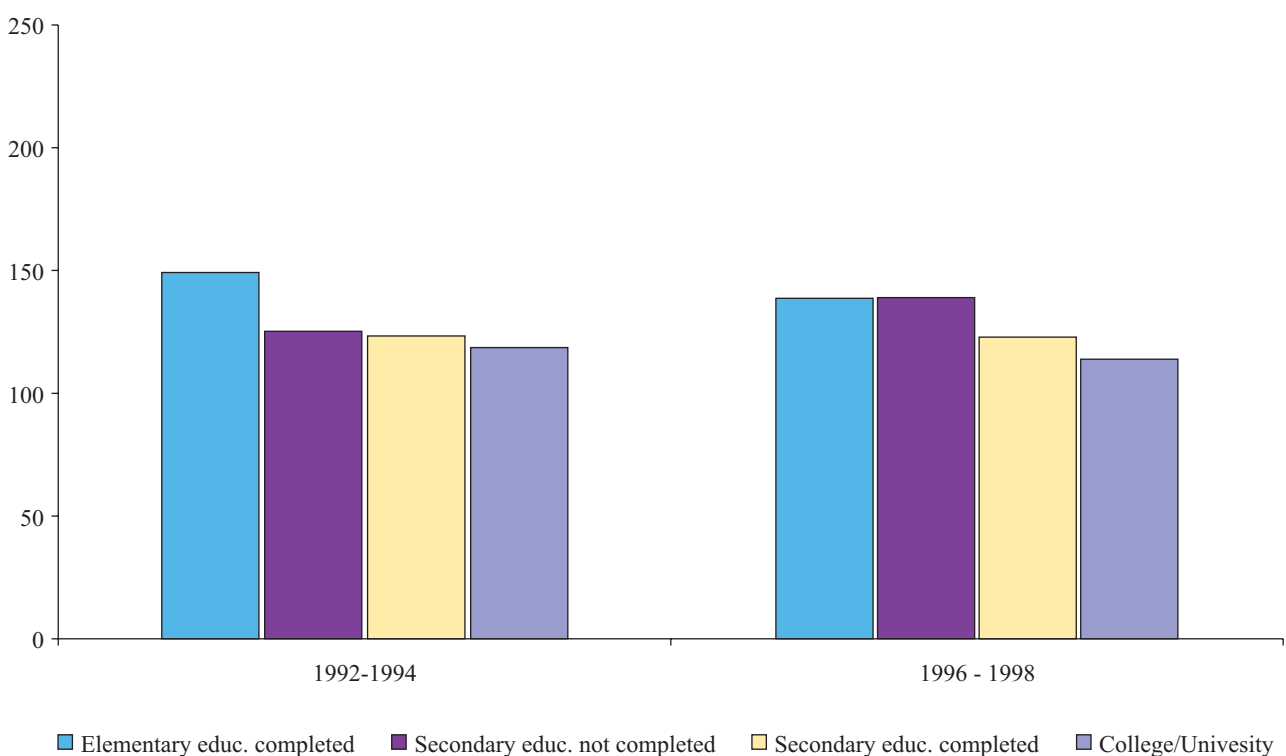




**Average availability of four food groups, by year
(g/person/day)**

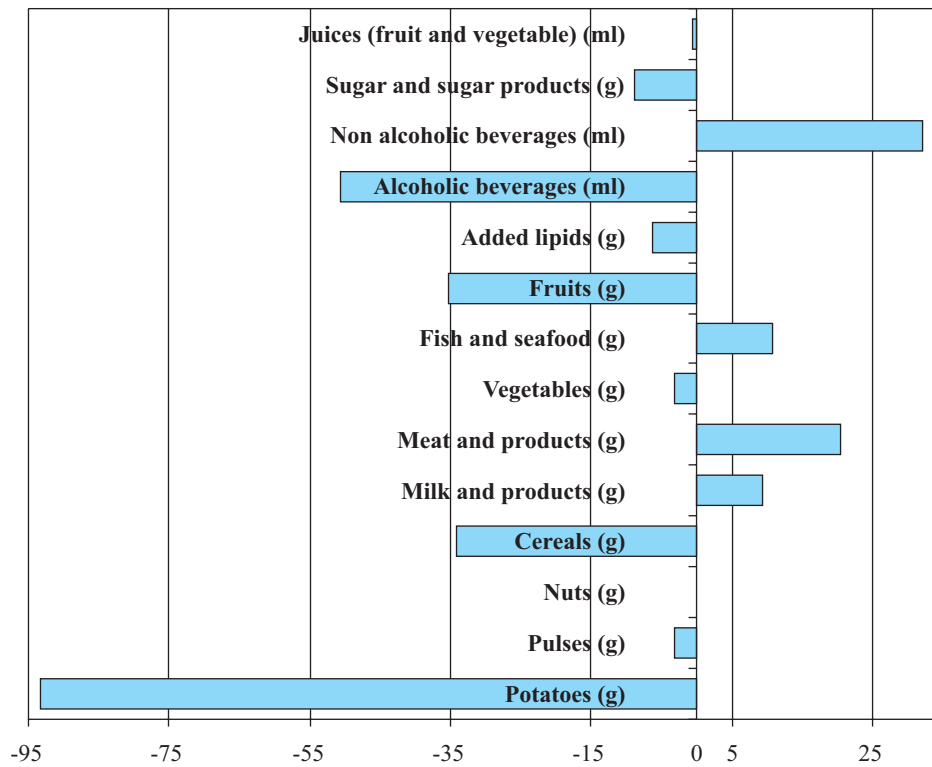


**Mean daily individual availability of meat and meat products,
by year and educational level of household head (g/person/day)**

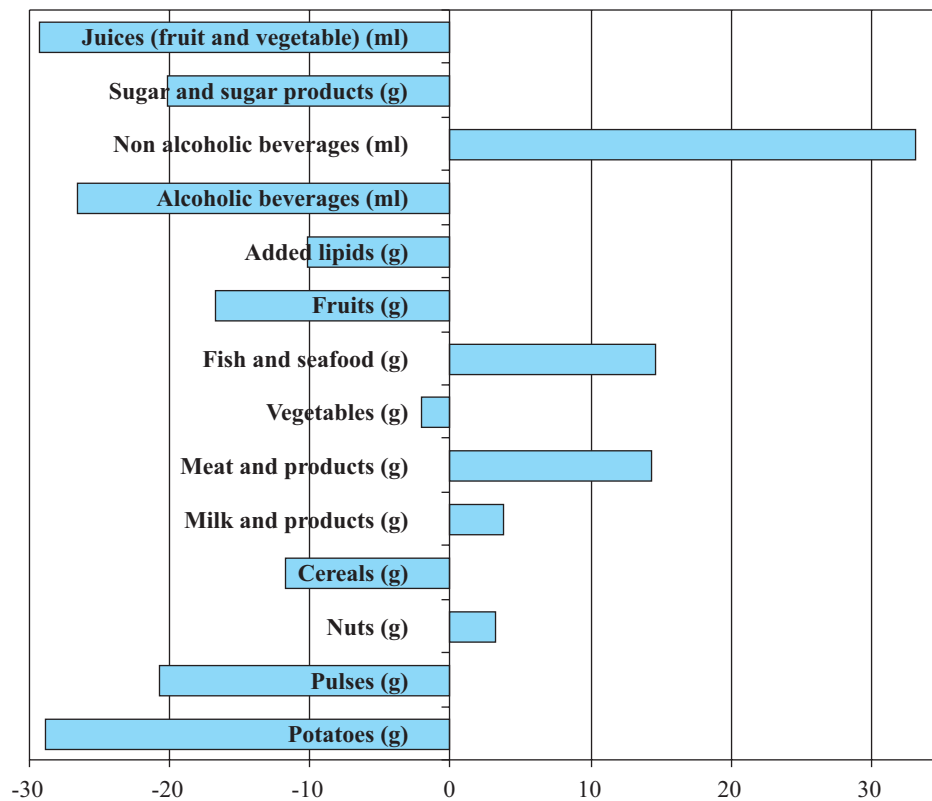




Change in mean food availability from 1989 to 1995
(quantity/person/day)

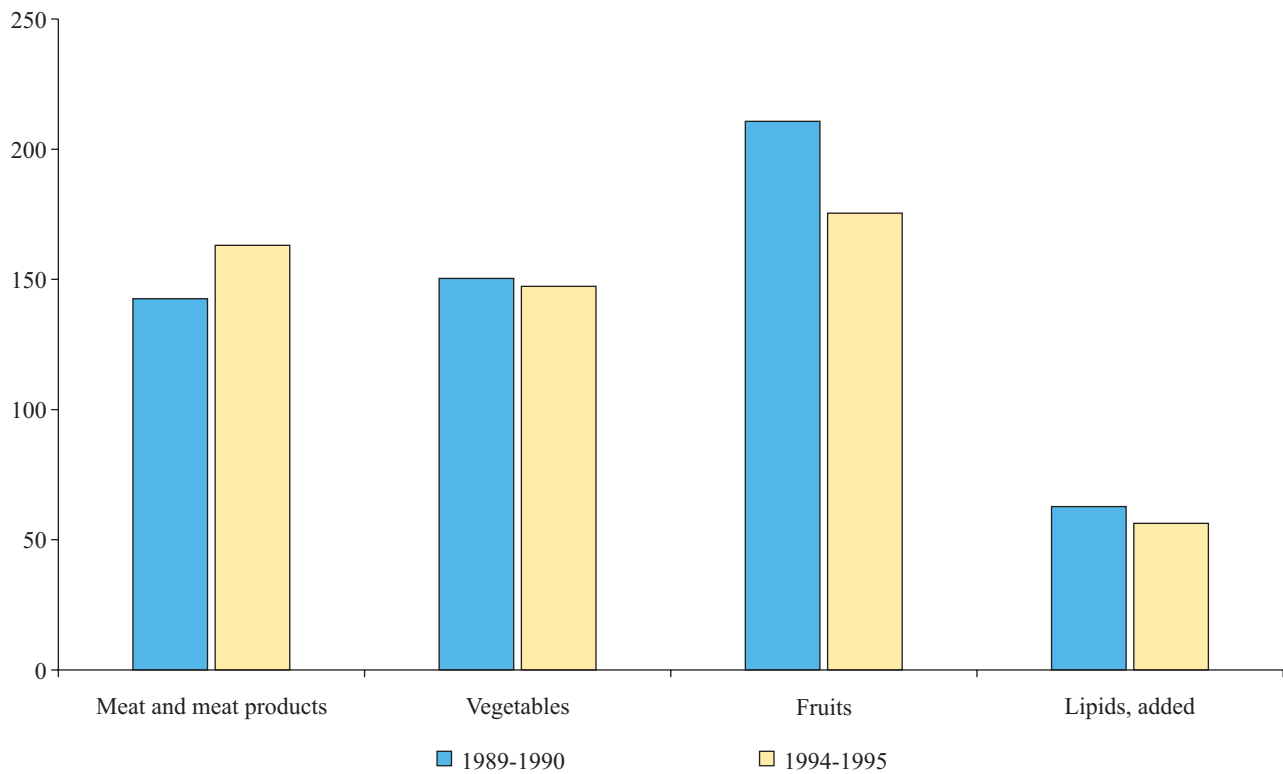


Percent change in mean food availability from 1989 to 1995
(quantity/person/day)

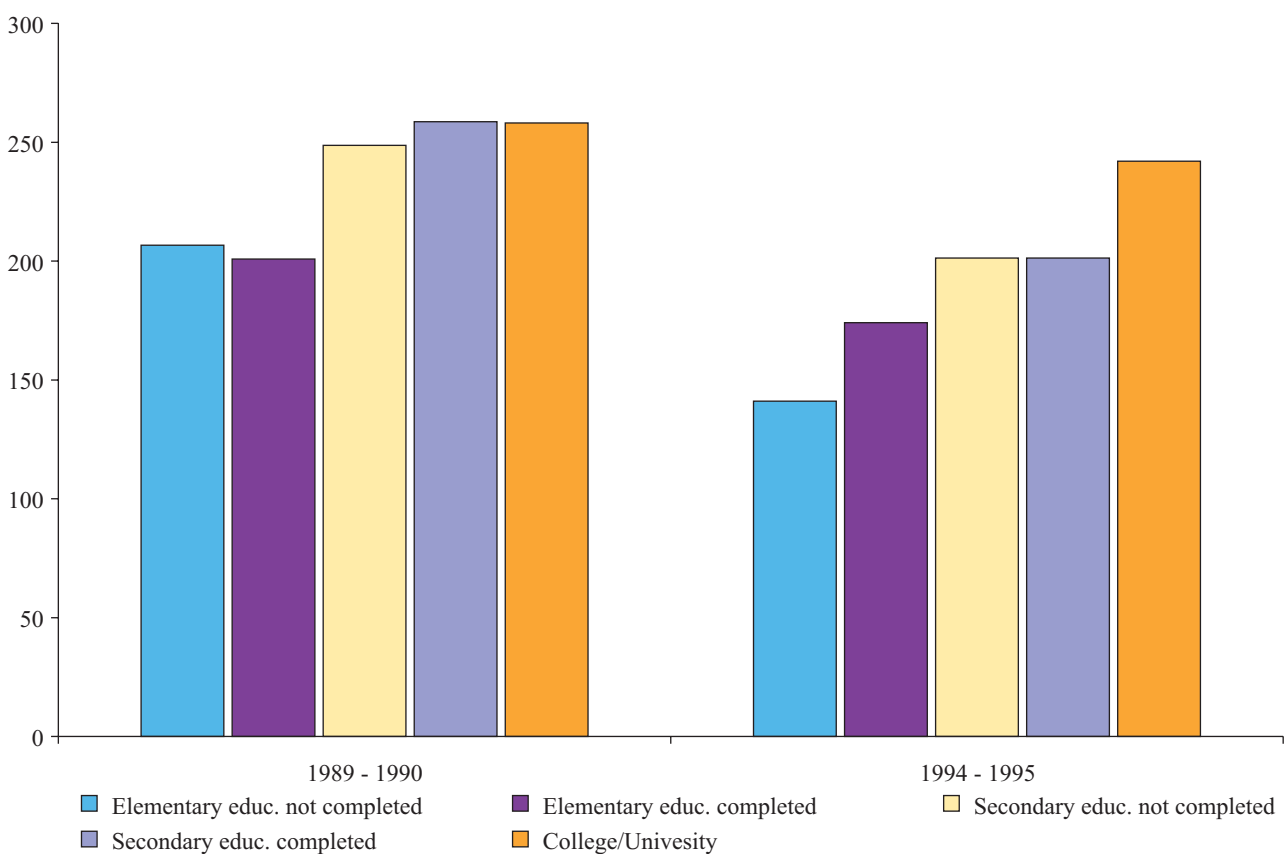




**Average availability of four food groups, by year
(g/person/day)**

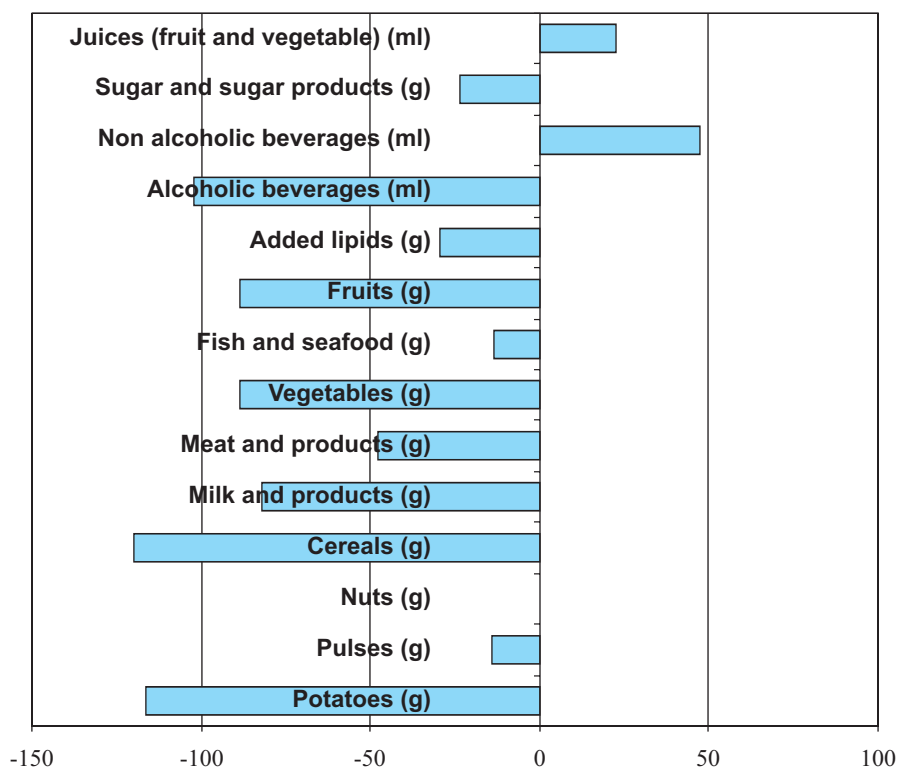


**Mean daily individual availability of fruits by year and educational level
of household head (g/person/day)**

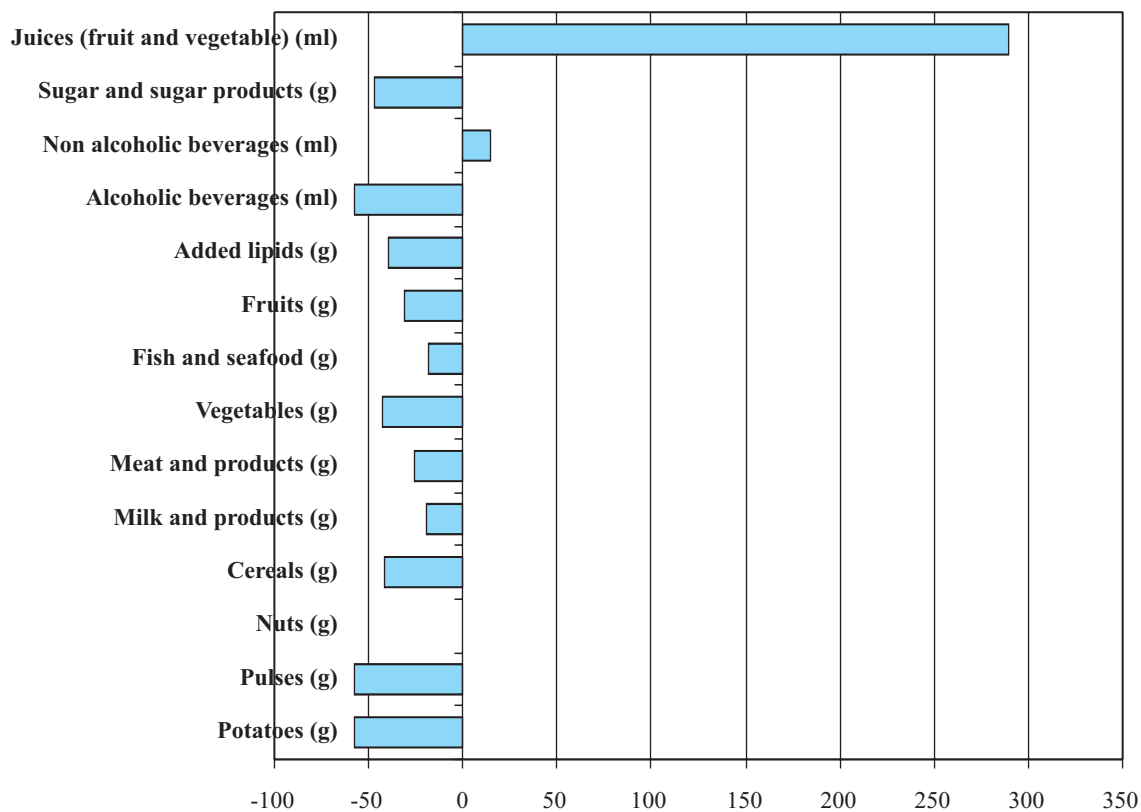




**Change in mean food availability from 1980 to 1999
(quantity/person/day)**

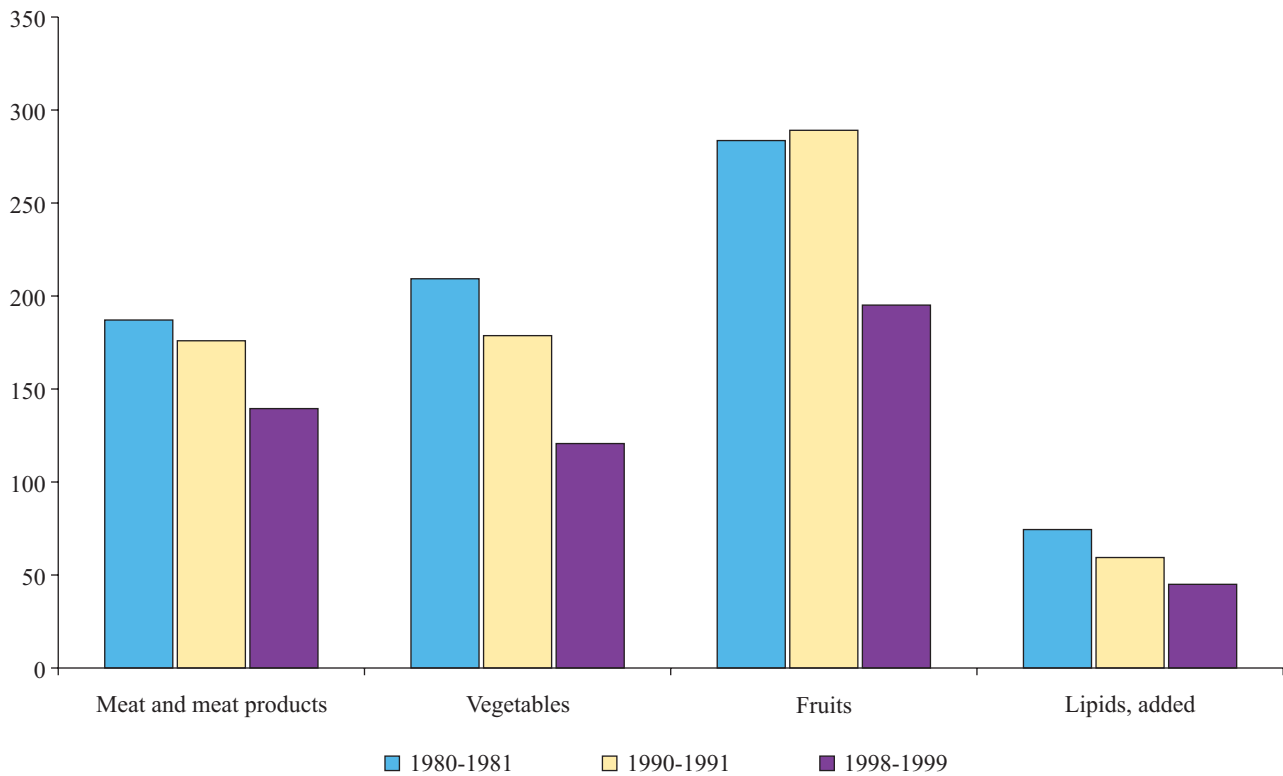


**Percent change in mean food availability from 1980 to 1999
(quantity/person/day)**

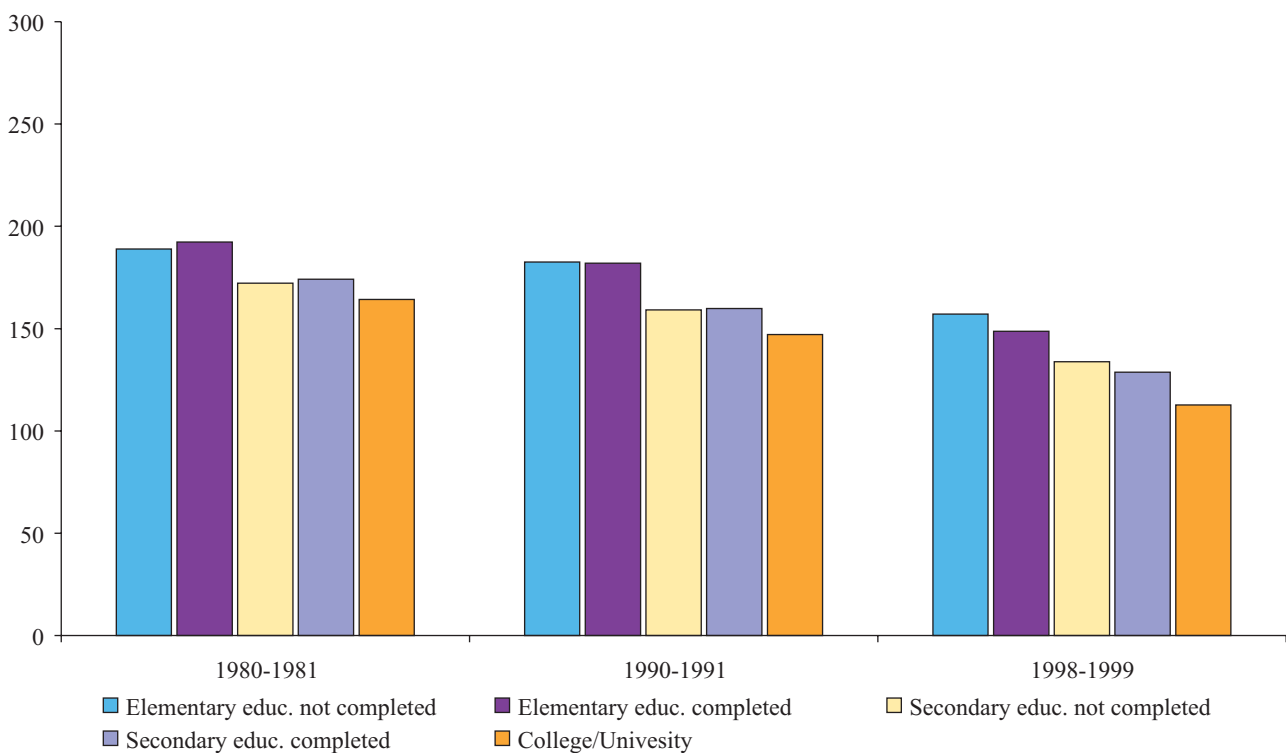




**Average availability of four food groups, by year
(g/person/day)**

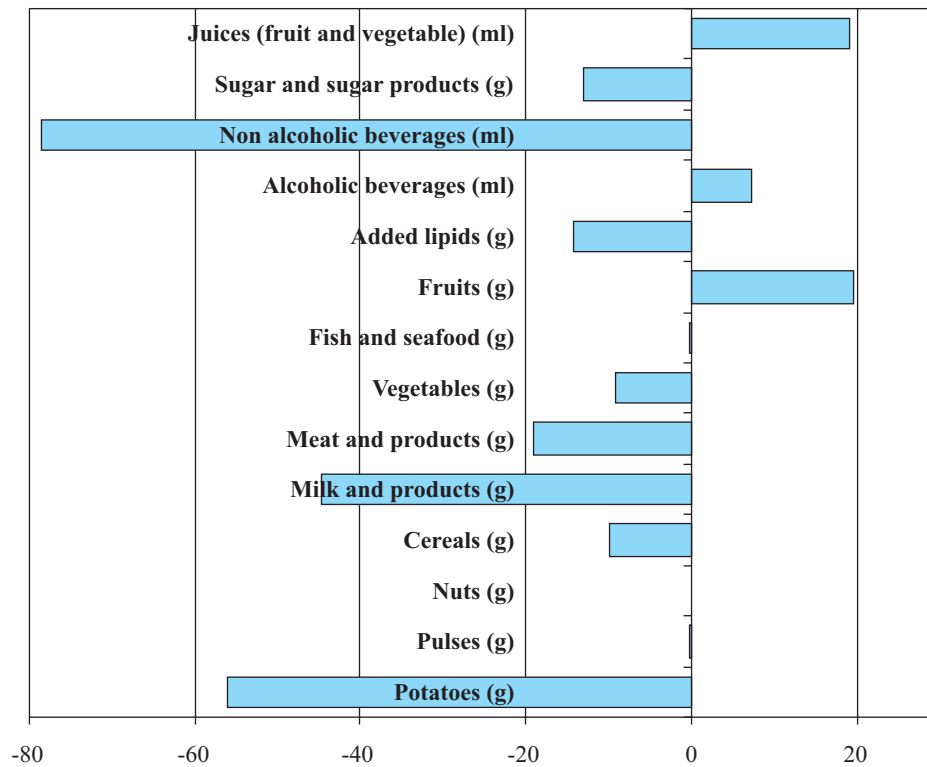


**Mean daily individual availability of meat and meat products,
by year and educational level of household head (g/person/day)**

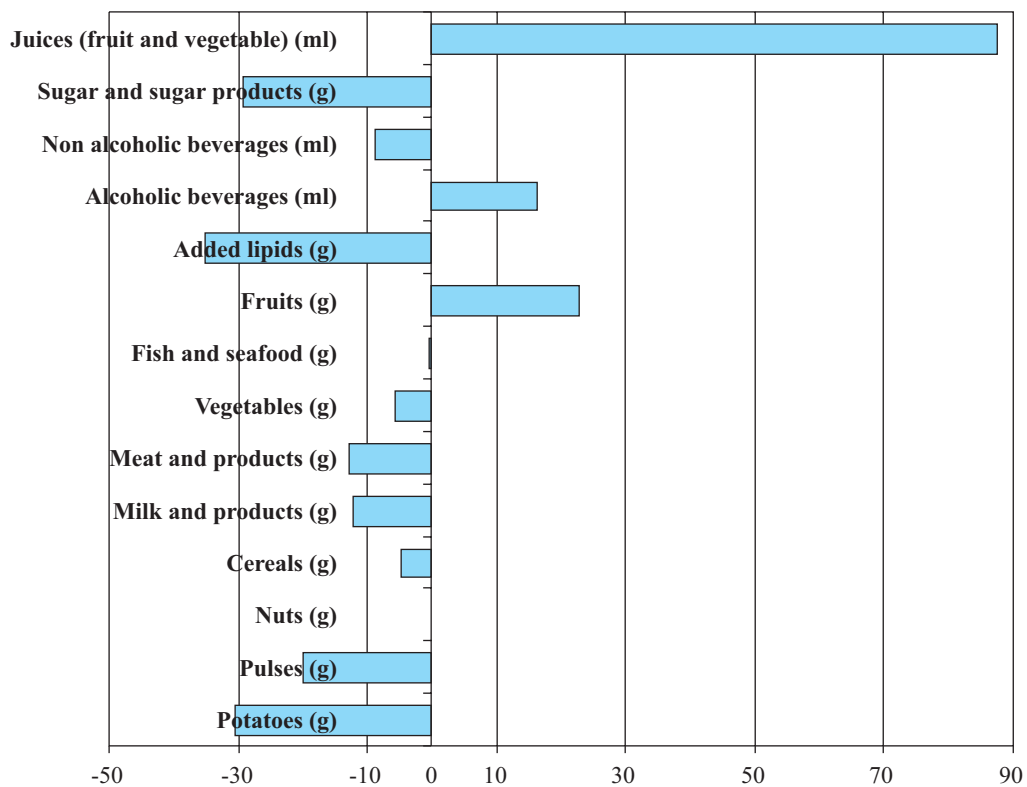




Change in mean food availability from 1985 to 1999
(quantity/person/day) *



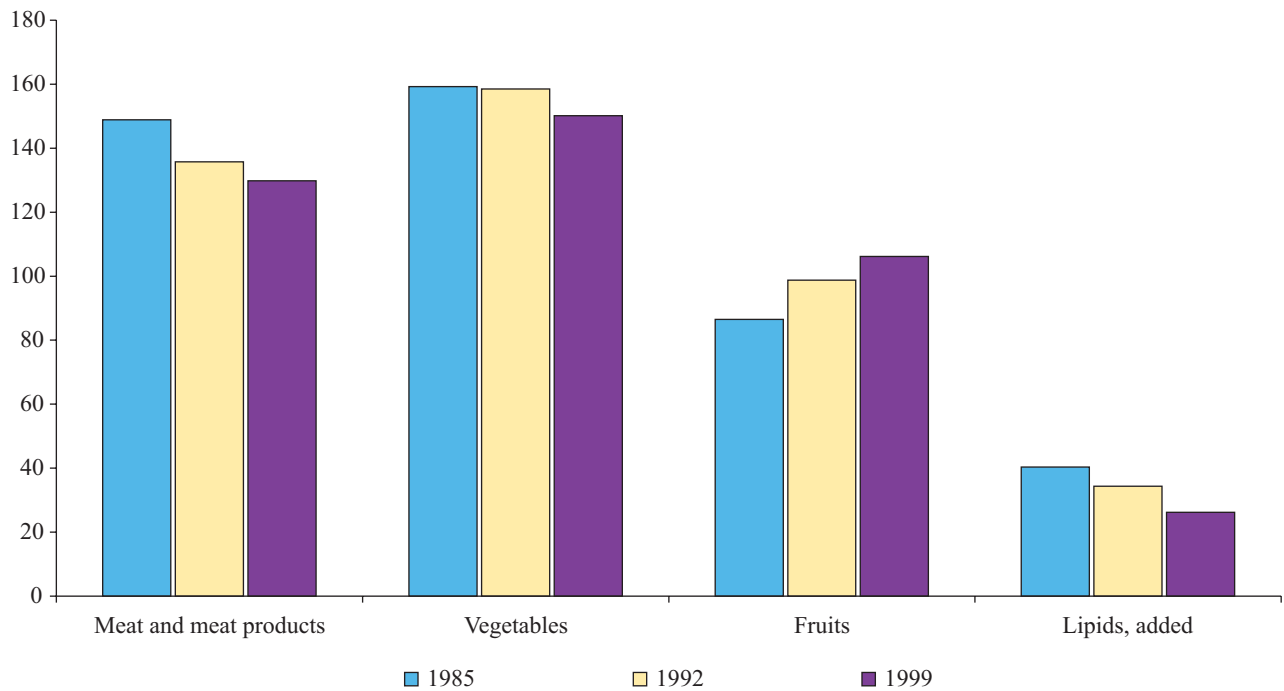
Percent change in mean food availability from 1985 to 1999
(quantity/person/day) *



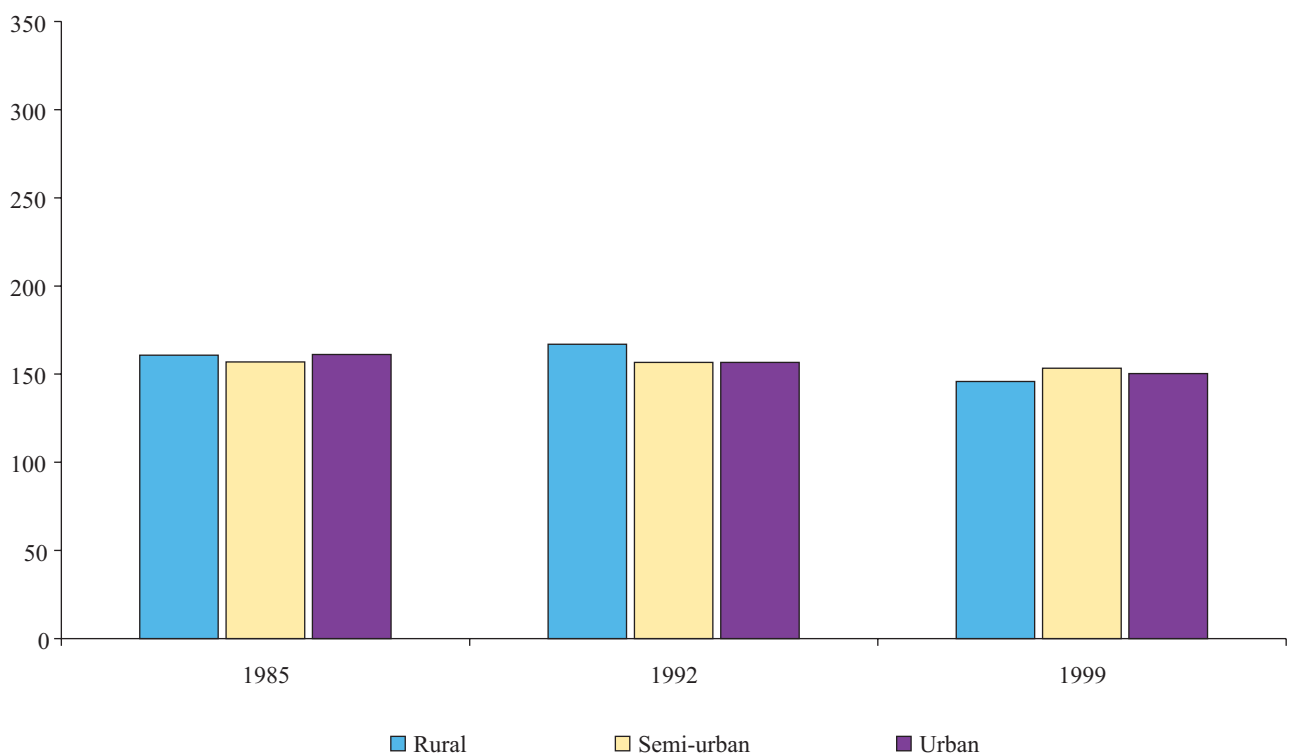
* Data on alcoholic beverages were collected in 1992, for the first time.



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

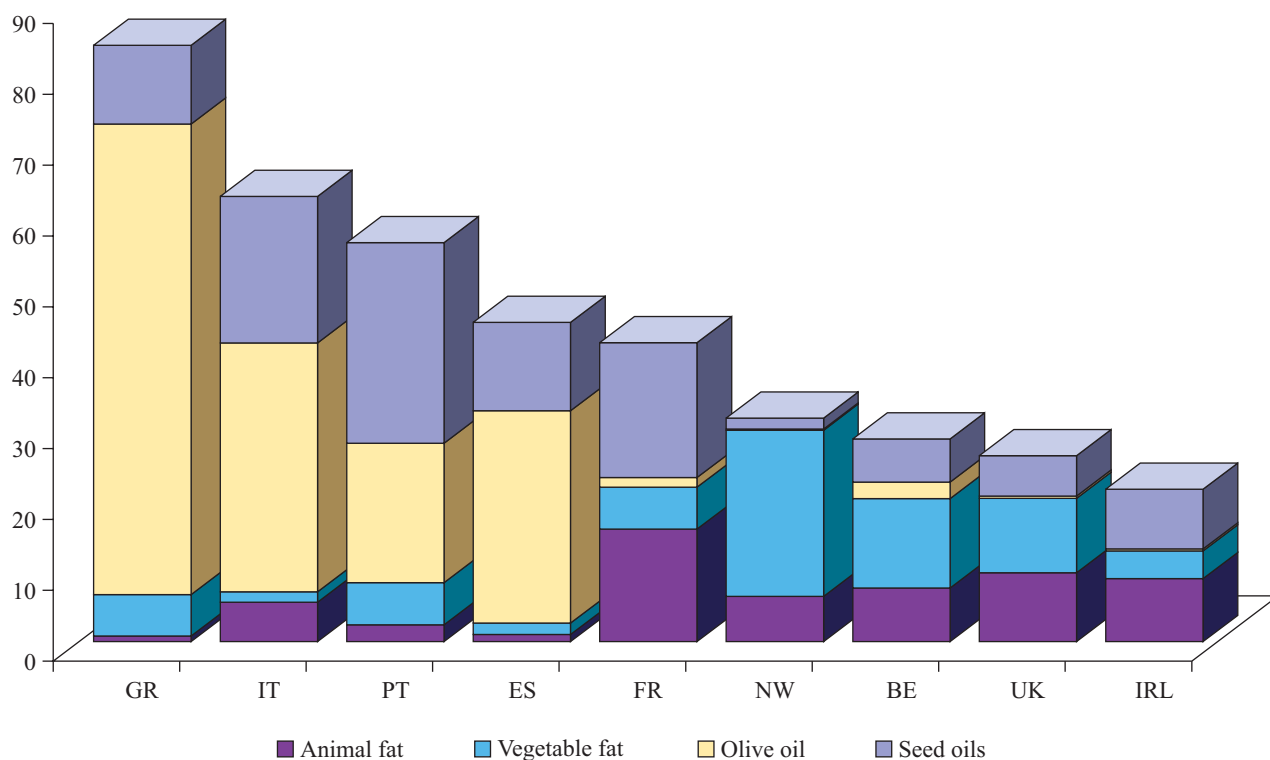


**Mean daily individual availability of vegetables,
by year and locality of the household (g/person/day)**

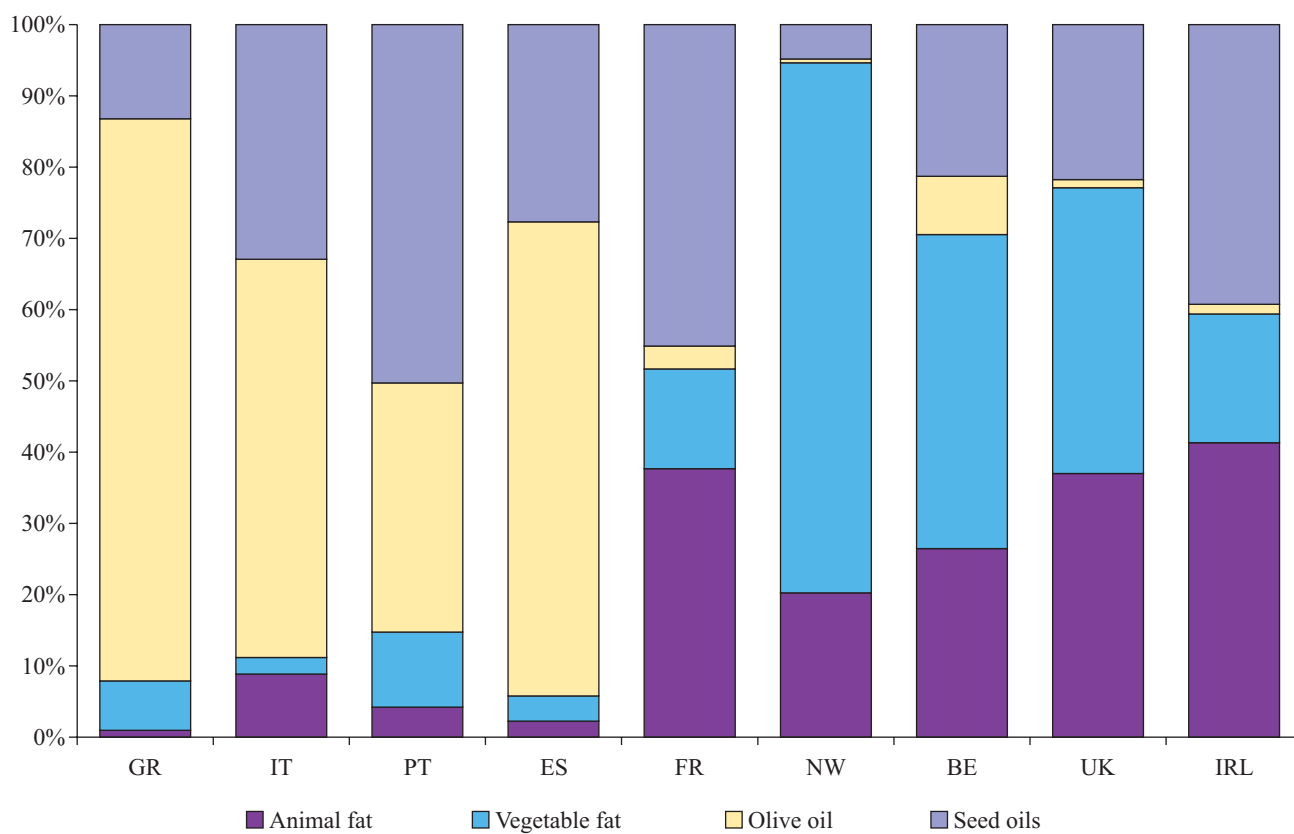




Average availability of total added lipids by type in the DAFNE countries, circa 1998 (g/person/day)*



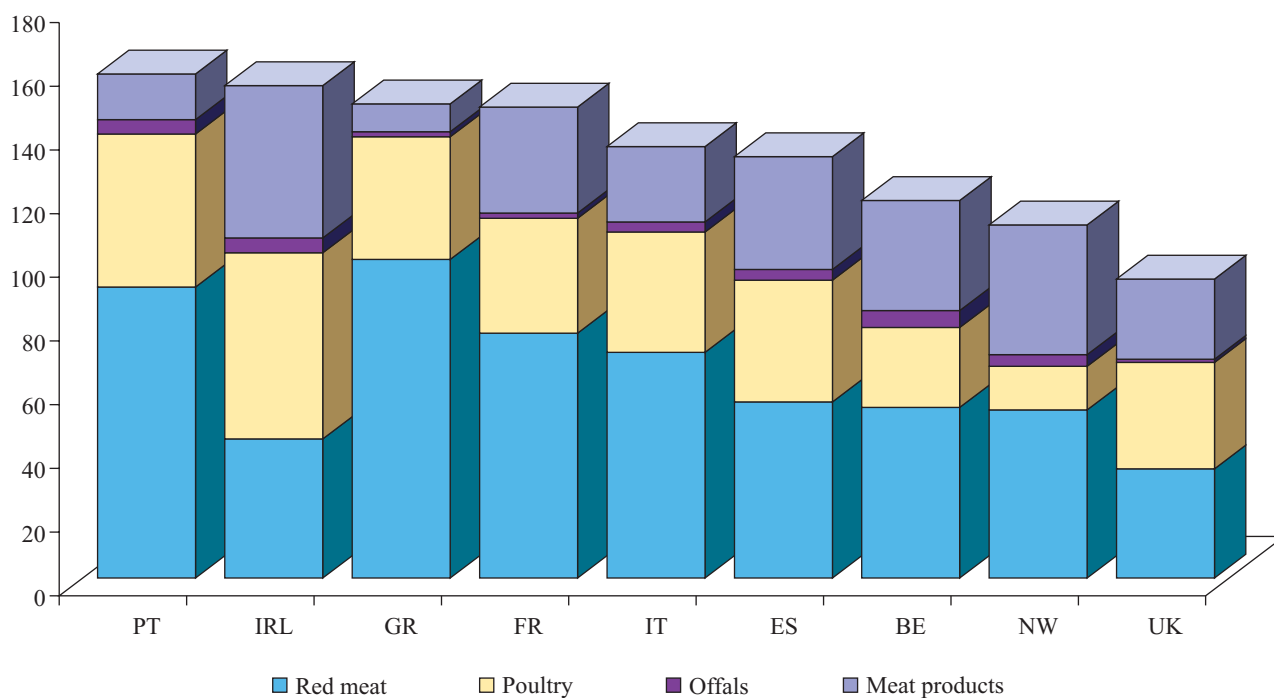
Types of added lipids as a percentage of the total added lipid availability*



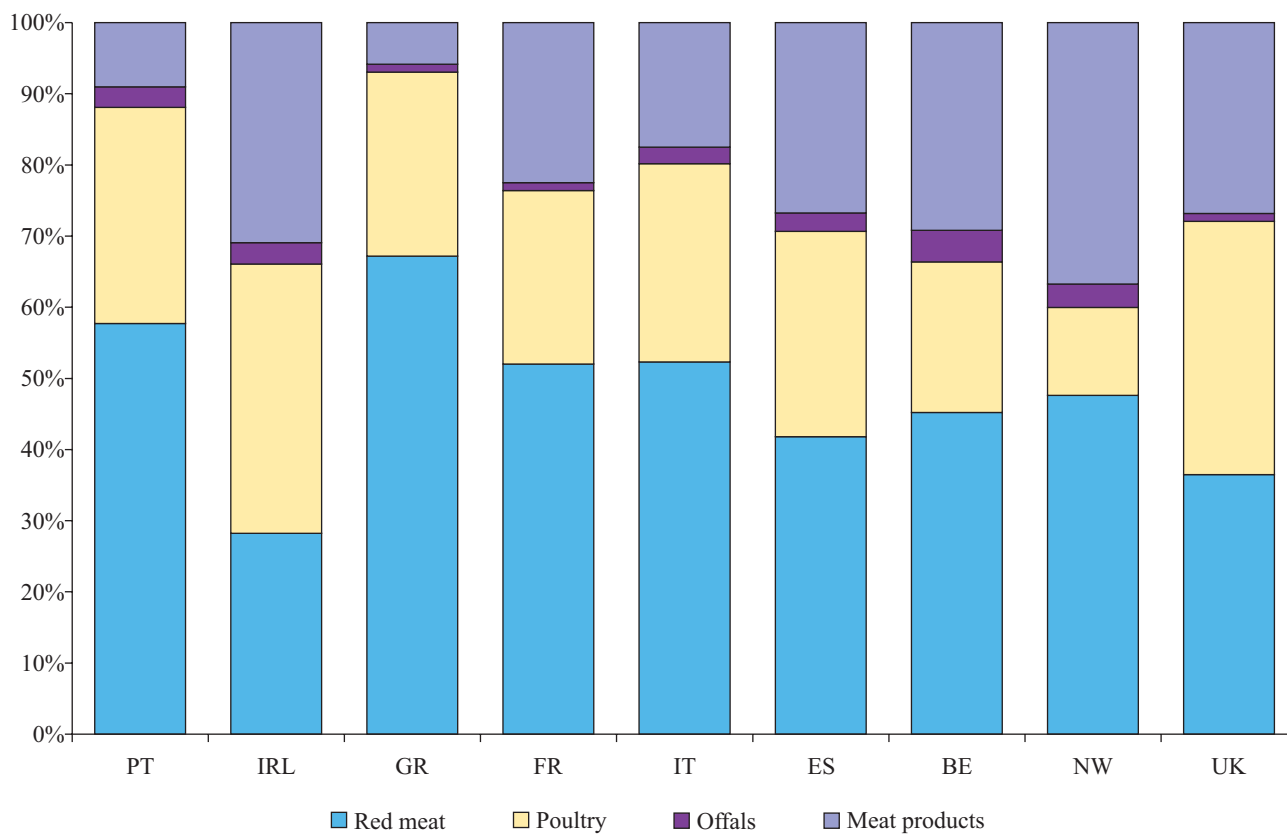
* In France, data were collected in 1991.



Average availability of meat by type in the DAFNE countries, circa 1998 (g/person/day)*



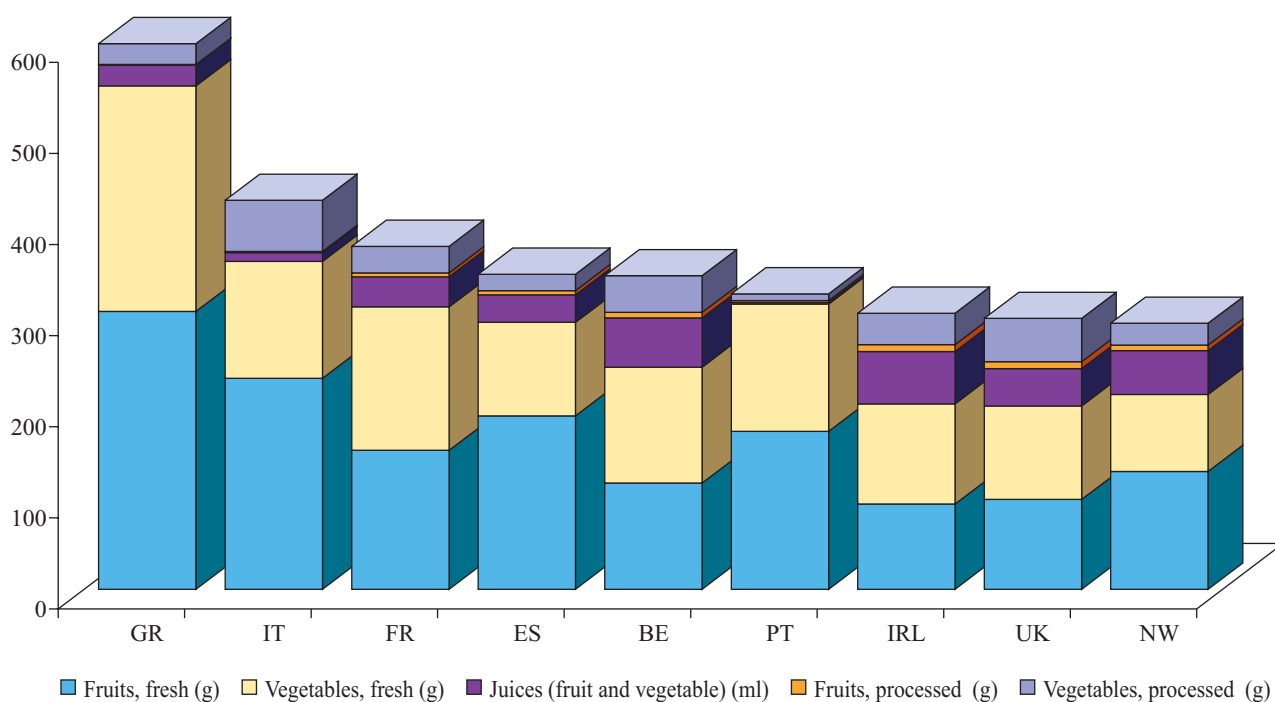
Types of meat as a percentage of the total meat availability*



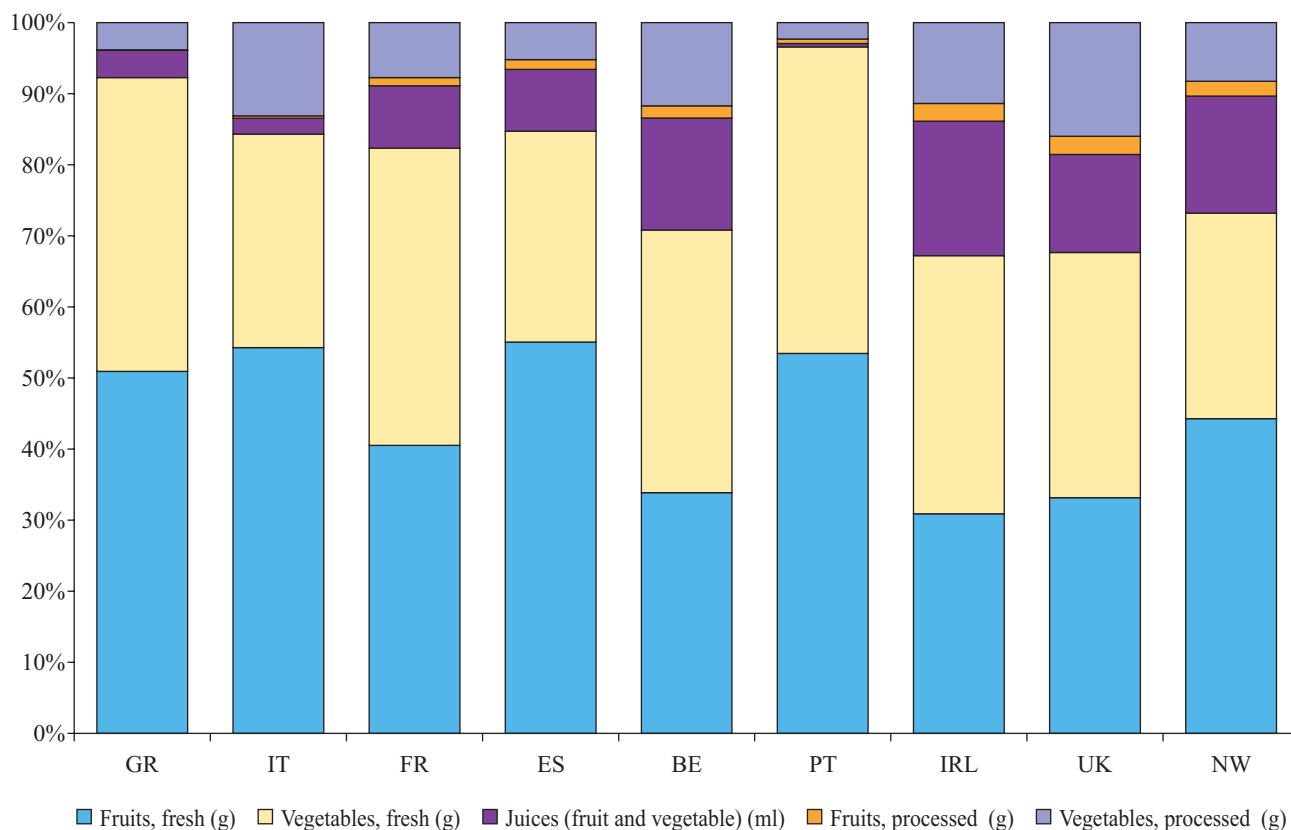
* In France, data were collected in 1991.



Average availability of fruits and vegetables by type in the DAFNE countries, circa 1998 (quantity/person/day)*



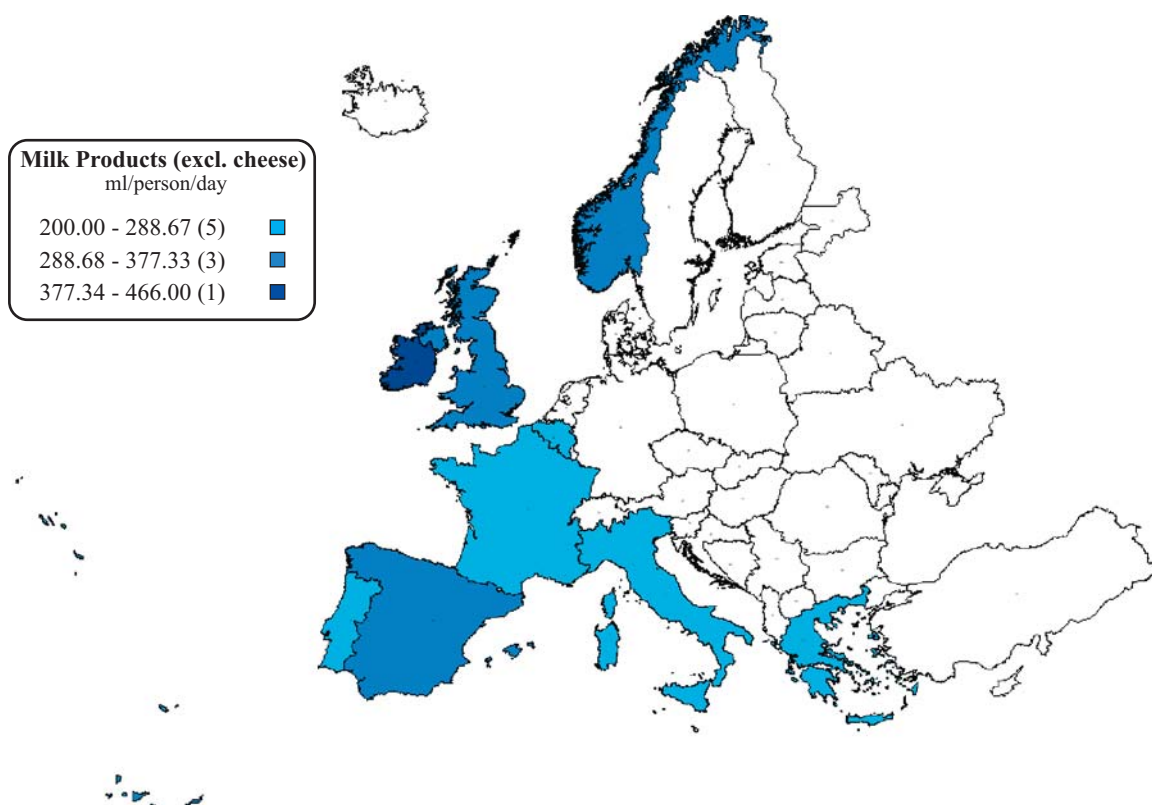
Types of fruits and vegetables as a percentage of the total fruit and vegetable availability*



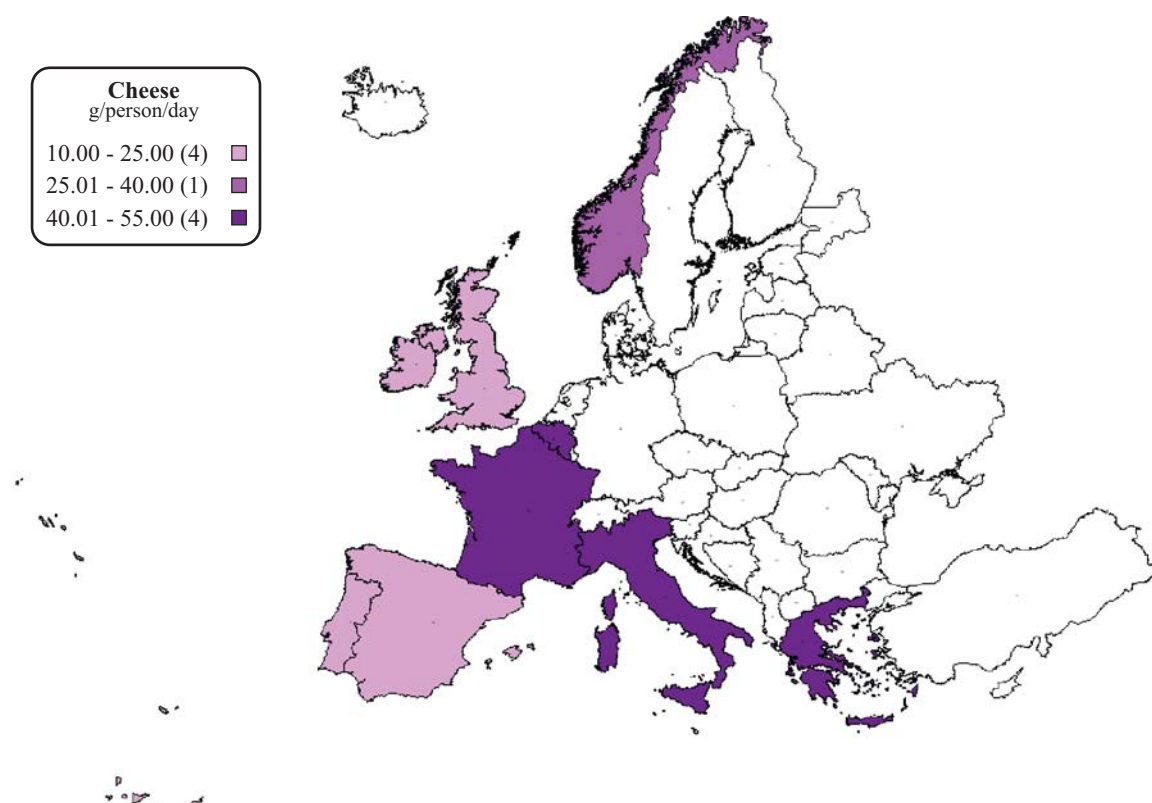
* In France, data were collected in 1991.



**Availability of milk and milk products (cheese excluded),
in 9 DAFNE countries, around 1998 (ml/person/day)***



Availability of cheese, in 9 DAFNE countries, around 1998 (g/person/day)*



* In France, data were collected in 1991.

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