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List of Abbreviations

European Countries

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
DK	Denmark
DE	Germany
EE	Estonia
FI	Finland
FR	France
GR	Greece
IE	Ireland
IT	Italy
LV	Latvia
LT	Lithuania
LU	Luxembourg
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SK	Slovakia
SI	Slovenia
ES	Spain
CZ	Czech Republic
HU	Hungary
UK	United Kingdom of Great Britain and Northern Ireland

Other Abbreviations

AICR	American Institute for Cancer Research
BMI	Body mass index (body weight in kg/body height in m^2)
CHO	Carbohydrates
CSI	Consumer Similarity Index
CVD	Cardiovascular diseases
DAFNE	Data Food Networking databank
%E	% of total energy
FAO	Food and Agriculture Organisation
FAOSTAT	Food and Agriculture Organisation Statistics
FBS	Food balance sheets
IDR	Import Dependency Ratio
MAI	Mediterranean Adequacy Index
NSP	Non-starch polysaccharides
OECD	Organisation for Economic Co-operation and Development
SPSS	Statistical Software Package
SSR	Self-Sufficiency Ratio
WHO	World Health Organisation

1. Aims of this Study

Diet has been known for many years to play a vital role for a healthy lifestyle but also as risk factor for chronic diseases. Sufficient and safe food supplies can prevent malnutrition and reduce the risk for chronic diseases. Diets evolve over time and are influenced by many factors and complex interactions. Income, prices, individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors shape dietary consumption patterns. Data on the national supply of the main food commodities provide a valuable insight into diets and their development over time.

The Food and Agriculture Organisation (FAO) produces annual Food Balance Sheets (FBS) which provide national data on food supply. FBS give a complete picture of the supply and utilisation of food commodities in a country. The standardised method of comprising FBS make long time trends of food supply comparable between countries. The food supply of a country can also be compared to nutritional demands. Additional calculations can be made; for example a dependency of countries on imports can be calculated, forecasts of future developments can be generated and combined with data from household surveys FBS make it even possible to estimate the food distribution in a country. All these possibilities make FBS a vital tool for political decisions.

This study will firstly discuss the historical development of FBS and their structure and methodology in Austria.
Then the focus is brought to an international level. Therefore it is needed to look at standardised data. The FAO provides this data also for all the European countries. In the next section the applicability of the FBS for nutrition assessment is discussed and advantages and limitations are described. Dietary patterns and trends in Europe will be highlighted.
In chapter three the Material and Methods will be introduced and all the possible and used commodities are given.
In a final chapter the results will be presented and discussed.

Firstly a summarising overview over all commodities will be given. Followed by a detailed analysis of each commodity, including additional calculations; for example an vegetal/animal-ratio or proportions of food commodities comparing them to related commodities.
Also the composition of the macronutrients is analysed over time.
Finally the growing harmonisation of diets in the European Union is examined using the concept of the Consumer Similarity Index (CSI).

This study will also be published as part of the European Nutrition and Health Report. The first European Nutrition and Health Report, funded by the European Commission, was published 2004 with 14 participating countries [ELMADFA and WEICHSELBAUM, 2004]. In this study the current 27 member states of the European Union will be included.

2. Literature Review

2.1. Introduction

Nutrition surveys are realised since the 19th century to ascertain consumption of foodstuffs and thus fulfilment of nutrient demand in individuals and collectives. The varying motives of the different institutions who are interested in nutrition surveys account for the various goals of these studies [ELMADFA and LEITZMANN, 1998].

Such goals can be:

- characterisation and analysis of the human diet
- estimation of the nourishment status
- element of epidemiological studies
- foundation for developing, executing and evaluating political actions

The goals of the study, available means and number of tested persons influence the choice of method.

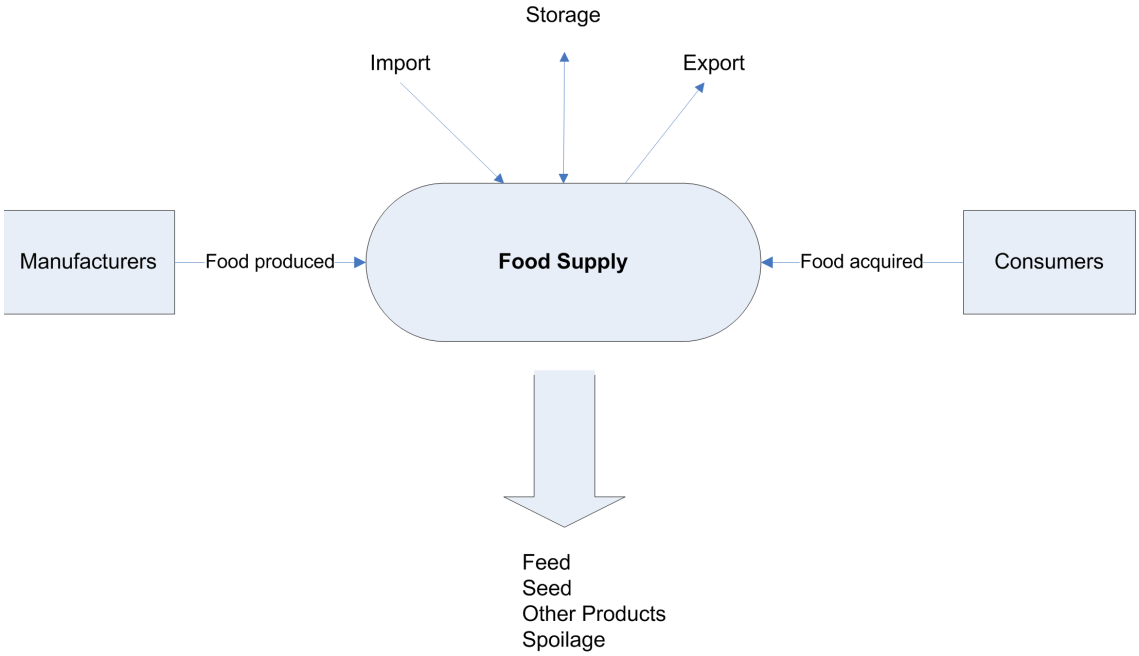
An indirect method for nutrition surveys are Food Balance Sheets (FBS). The foundation of FBS is not an individual survey but uses already known data, that was collected for other purposes. Local food production and imports are the foundation of the national food supply. Other factors that need to be included into the calculation of available food supply are exports, storage supplies, seed-stock, how much is lost by spoilage and what is used to feed livestock [BECKER and GILLIN, 2008].

This results in the following calculation:

$$Food\ Supply = \frac{Production + Import + Storage - Other\ Products - Spoilage - Export - Feed\ Stock - Seed\ Stock}{Population\ Number}$$

Food Supply	Food Supply per Capita
Production	Domestic Food Production

Figure 1: Interacting Factors on Food Supply



Source: original illustration

In this manner not the actual consumption is measured, neither is it possible to draw a conclusion about the distribution of foodstuffs within the population. Vulnerable population-groups are not considered. Furthermore the use of already existing data makes the evaluation of data accuracy impossible [ELMADFA and LEITZMANN, 1998].

Nevertheless FBS give a good idea of the general provision of a country and are a groundwork for further nutrition programs. They give a general idea of nutrition customs and the character of staple foods. An advantage of FBS is the simple accessibility of the data and the possibility to compare international data [ELMADFA and LEITZMANN, 1998].

Diets evolve over time, are influenced by many factors and underlie complex interactions. Income, prices, individual preferences and beliefs, cultural traditions besides geographical, environmental, social and economic factors all interact to shape dietary consumption patterns [WHO, 2002]. FBS are a useful tool to give an overview of the actual outcome of all these complex interactions.

Food balance sheet data answers following national and international purposes:

- basis for agropolitical decisions
- instrument to overview and administrate national and EU agricultural markets
- assessment for orientation and development of markets
- contribution to the report on the situation of the national agriculture
- preparation of the agricultural resource account (in Austria: Landwirtschaftliche Gesamtrechnung, LGR) according to the European system of economic resource accounting (Europäisches System Volkswirtschaftlicher Gesamtrechnung, ESVG)
- national balances are consolidated by the European bureau of statistics (Eurostat) to create joint food balance sheets.

[WILDLING, 2007]

2.2. Food Balance Sheets in Austria

2.2.1. Historical Development and Use of FBS in Austria

The first nutrition balances in Austria were created after the second world war in line with the European Recovery Program (1948-1952), starting with balances for the pre-war years of 1934 to 1938 and the post-war year 1947/48. In the following years, balances were calculated and made available for the Organisation for Economic Cooperation and Development (OECD) and the Food and Agriculture Organisation (FAO) [WILDLING, 2007].

Since 1972/73 the Austrian Central Bureau of Statistics (ÖSTAT; today called Statistik Austria) is responsible for the compilation of nutrition balances. Calculations for plant and animal balances are made annually for one economic year.

The entry of Austria to the European Union in 1995 made it necessary to change the Austrian nutrition balancing system to the European food balance sheet system to allow a comparison between the member states. Recalculations for the previous years were generated with retrospective effect using international calculation methods. With the introduction of the European food balance sheet system the former nutrition balances were replaced by FBS, which follow international standards and are thus easier comparable.

The government authority that commissions the compilation of food balance sheet data is the responsible federal ministry [WILDLING, 2007].

2.2.2. Characteristics of Austrian Balance Sheets

Classifications

Concerning Imports and Exports the calculation of Austrian food balances are subjected to the combined nomenclature of the foreign trade statistics.

All calculations of the Austrian Balance Sheets are based on EU handbooks and the basic principles from the FAO with regard to national conditions and requirements [WILDLING, 2007].

Legal Foundation

The preparation of annual national FBS is regulated in an agreement from the August 11th 2000 between the „Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft“ and the Statistik Austria, based on § 23 clause 2 of the Bundesstatistikgesetz (BGBL. Nr. 163/1999) [Österreichischer Nationalrat, 1999].

The EU data exchange is controlled by regulations with additional regulations for the collection and identification of wine products for the FBS of wine. The conveyance of FBS to EUROSTAT is done in the name of a gentleman`s agreement [WILDLING, 2007].

Publication

The final data are available in the subsequent year at the end of April for plant foods, and the end of August, in the case of animal foods. The final figures get transmitted to the FAO and EUROSTAT on the 1st of March the following year.
Revisions on underlying data or the existence of new circumstances conclude in new calculations, possible corrections on previous years are made. The resulting data is re-transferred to the FAO and EUROSTAT [WILDLING, 2007].

2.2.3. Methodology

A FBS is a synopsis of quantitative and qualitative information on agriculture and the food sector. To capture the entirety of a product a FBS of a commodity also includes the most crucial processed products unless they are described in an independent FBS. That way it is possible to ensure a clear overview of exports and supply of a specific product.

FBS are calculated with consideration for national circumstances and economics like local structures for production and commercialisation, data availability, foreign trade guidelines. FBS are publicised in product-specific detailed balances of quantity- and utilisation-calculations [WILDLING, 2007].

Account Units

FBS for the animal sector comprise six main groups with twenty-seven detailed balances for the time period of one calendar year from the 1st of January to the 31st December [WILDLING, 2007]:

- Milk and milk products
- Meat
- Poultry
- Eggs
- Fish
- Animal fats

FBS for the plant sector comprise twelve main groups with ninety detailed balances for the time period of one economic year from the 1st of July to the 30th of June. For the FBS for wine the economic year is from the 1st of August to the 31st of July [WILDLING, 2007]:

- Cereal
- Oilcrops
- Plant fats and oils
- Fruit
- Vegetables

- Potatoes and potato starch
- Rice
- Pulses
- Honey
- Sugar
- Wine
- Beer

Sources

For the compilation of FBS the following fundamental statistical information is used:

- Agricultural production statistics
- Foreign trade statistics
- Economic statistics
- Population statistics

Another important source of information is the Austrian Federal Economic Chamber [WILDLING, 2007].

Additional calculations

Using the compiled data from sources above mentioned further calculations can be made.

With the known amount of foodstuffs that is available for a one time period and the population in this period, it is possible to calculate a *Per Capita Supply* (per day or year) to show an average supply for all inhabitants. Nevertheless it is not possible to differentiate between heterogeneous population groups of varying age, gender or income. Also seasonal changes and the influence of tourism are not accounted for.
The FBS for cereal is a special case. Different grades of comminution and the frequency of the usage of different milling grades are considered.

For the calculation of FBS of meat, defined ratios to calculate bones, sinews, waste and amounts that are used to feed domestic animals are used. These quantities are then subtracted from the supply for human consumers [WILDLING, 2007].

2.2.4. Quality Ensuring Methods

All partial results are discussed with the originators of the underlying data and external experts from various institutions and fields including universities, marketing, food industry and interest groups. Furthermore the data are compared to data from similar countries and results of relevant studies. In the context of an agricultural resource accounting, balance figures are analysed and undergo a comprehensive plausibility check.

As a dynamic system food balance sheet data undergo constant and retroactive modifications based on changing situations on the agricultural and food sector [WILDLING, 2007].

Relevance, Accuracy and Actuality

Regular discussions with experts of relevant fields guarantee the consideration of new information and thus the development of high quality balances.
The accuracy of food balance sheet data is mostly dependent on the availability and quality of the underlying basic data.
Actuality of food balance sheet data is primarily determined by the availability of the underlying data. Here the foreign trade statistics are of specific importance as they are rate determining [WILDLING, 2007].

Comparability

Temporal comparability of main food groups (i.e. meat, milk and wine) till 1960 is possible, since new methods have been applied retroactive. For some food groups, changes in methodology are negligible (fruit, vegetables, cereal, fish). Comparison of time series is possible without difficulties.

Austrian FBS refer to the whole federal territory and are easily comparable with other nations, especially countries of the European Union [WILDLING, 2007].

2.3. FBS on an International Level

The FAO constitution appoints the goal of the organisation to „collect, analyse, interpret and disseminate information relating to nutrition, food and agriculture“ [FAO, 1945].

The FAO Statistics Division executes five main activities to follow this mandate:

- Collection of data on agricultural statistics
- Selection of the collected data after analysis
- Filling-in gaps where necessary
- Processing and storage of data
- Dissemination of data

FBS are one of the main duties of the FAO Statistics Division [BECKER and GILLIN, 2001].

2.3.1. Historical Background of the FAO Food Balance Sheets

The first attempts at preparing FBS date back to World War I and played an important role in an international study of food consumption data in 1936.
During World War II, the interest in FBS increased considerably, and FBS were especially used for the management of food allocation and destribution in the period of food shortage after the war [BECKER and GILLIN, 2001].

In 1948 the FAO recommended that all governments should develop FBS and supported countries in establishing a system suitable to collect the necessary data.
1949 the „Handbook for the Preparation of FBS“ was published and also FBS for about 40 countries. From 1957 onwards balance sheets were published as three years average FBS. In 1977 FBS were published for already 162 countries [BECKER and GILLIN, 2001].
Later on there were many improvements in coverage of countries and food items.

The edition of 1975-1977 covered average FBS that showed per capita food supplies for calories, protein and fat, and for the first time also the supply of food groups of selected minerals and vitamins. The issue of 1994 and 1996 included about 180 countries [BECKER and GILLIN, 2001].

FBS are the main source of data used in the assessment of the world food situation by the FAO, starting from the First Food Survey in 1946 with the Sixth World Food Survey in 1996 [BECKER and GILLIN, 2001].

2.3.2. Characteristics of the FAO Food Balance Sheets

FBS present a comprehensive picture of the pattern of a country‘s food supply during a specified reference period. FBS show for each food item the sources of supply and its utilisation. The total quantity of foodstuffs produced in a country added to the total quantity imported and adjusted to any change in stocks since the beginning of the reference period, gives the total available supply during that period [BECKER and GILLIN, 2001].

In utilisation a distinction is made between quantities exported, fed to livestock, used for seed, processed for food use and non-food uses and losses during storage and transportation [BECKER and GILLIN, 2001].

The per capita supply of each such food item available for consumption is obtained by dividing the calculated quantity by the complementary data on the population that takes part of it. Data on per capita food supplies are expressed in terms of quantity and by using appropriate food consumption factors also in terms of energy, protein and fat [BECKER and GILLIN, 2001].

Regularly calculated annual FBS over a period of years, will show trends in the overall national food supply, display changes in types of consumed foodstuffs that reflect on the pattern of the diet, and also reveal, to what degree the country supply is adequate in relation to national requirements [BECKER and GILLIN, 2001].

They are useful for developing projections of the future food supply needs, or to show the import dependency ratio. The amount of food crops used for livestock can be used for analysing livestock policies or patterns of agriculture [BECKER and GILLIN, 2001].

The concept of FBS is to measure the food supply of a population. Really, practise is often unable to match theory and consequentially statistics are often criticised for not meeting expectations. Household and food consumption survey data is often preferred because they provide more information on food consumption than FBS. Those surveys collect data directly from the buyers and consumers and thus also convey information on the consumption characteristics of varying population groups as well as rural and urban populations. This kind of information is not accessible from FBS. However if comprehensive data from household budget surveys is lacking, FBS are the only standardised source of data that allow an international comparison over time [BECKER and GILLIN, 2001].

2.3.3. Sources for FBS Data

The sources for FBS are extensive. FBS quality and coverage differ greatly between countries and commodities. Inaccuracies or errors can occur at any stage of the FBS construction. Thus the users have to keep the limitations of FBS in mind. Not even in all the developed countries are all the necessary requirements to an ideal statistical system met [BECKER and GILLIN, 2001].

Commonly used main sources are production and trade data, who are part of ongoing national official statistics. They are based on direct records or estimated by Government authorities.
Information on stock changes can be obtained from marketing agencies, factories or farmer stock surveys.
Information on industrial uses and losses occurring in industrial processing is available from manufacturing surveys.
Feed and seeding data can be procured from respective surveys or Government authorities.

Since the fundamental data is procured from varying sources, they are subject to incongruity [BECKER and GILLIN, 2001].

2.3.4. Conceptual Problems during the Preparation Process

A frequent problem is the coverage/representativeness of the underlying data. Production statistics are usually limited to commercialised major food crops. Non-commercial or subsistency production, like home production by households for their own consumption are not included, though this might be a considerable part of the total production in some countries. Manufacturing surveys only cover a part of industrial undertakings. Inventories of catering establishments, institutions and households might not be available. Information on waste and losses during storage, transportation or on foodstuffs intentionally discarded for the purpose of price control, epidemic disease control may also not be obtained. In these cases adjustments are necessary to adapt the basic data to FBS concepts [BECKER and GILLIN, 2001].

Another continual problem of basic data is incompleteness and inaccuracy. Production statistics might not be obtained for all needed commodities and even where data is available, they are not always dependable. One reason can be that crop patterns and utilisation of some crops are sometimes complicated, making it difficult to estimate production. Some kinds of foods might not even be included in FBS because national production statistics don`t cover them (i.e. meat from game, wild animals and insects). Meat from hunting may be a substantial part for animal protein in developing countries [BECKER and GILLIN, 2001].

Unrecorded trade across national borders, that falsifies import and export data, can occur.

Basic data on feed, seed and industrial use is somewhat limited. Seeding rates are fairly established, but feeding rates can only be estimated and there are many aspects that need to be considered. Also stock changes or losses go often unrecorded and coverage is sometimes only fractional [BECKER and GILLIN, 2001].

Estimations on population numbers are also a part of official statistics and thus per capita figures for each commodity can be obtained by dividing the figure for food available for consumption by the total population partaking of it in a specified reference period. Though this figure also might depend on either incomplete or unreliable data.

Also the time reference period used to generate FBS may induce problems. Several different twelve-month periods have been suggested and are in use. But none of these cover all commodities, trade and domestic utilisation satisfactorily and uniformly [BECKER and GILLIN, 2001].

2.3.5. Accuracy of FBS

The accuracy of FBS as derived statistics depends on the reliability of the underlying statistical data. These vary greatly in coverage and accuracy. Effectively there are many gaps in data on feed, seed, manufacture and farm, commercial and sometimes government stocks. Gaps in data can be overcome by estimations whereas the effect of absence of data can be reduced by calculating FBS as an average of three-year periods. Even complete data on production and trade is often improved by appropriate statistical field surveys.

To assure the quality of FBS several processes ensure the reliability of information. To further the quality of FBS, all statistical information, underlying concepts, definitions and methods undergo various consistency checks and comparisons to respective additional information.

The food available for human consumption is finally calculated as a residual from other components of domestic supply. Thus its reliability depends on availability and accuracy of the underlying data. As long as the majority of the fundamental data is available and reliable, and reasonable adjustments are made, food supply estimations are reliable. Contrary if the basic data is incomplete or unreliable, food supply estimations can not be accurate.

While FBS are often far from satisfactorily in the proper statistical sense, they do provide an approximate picture of the overall food situation in a country [BECKER and GILLIN, 2001].

2.3.6. Composition of FBS by the FAO

Food balance sheet items, Commodities

In principle all potentially edible commodities should be taken into account in preparing food balance sheets, but for practical purposes a pragmatic list of commodities is used. Generally FBS are constructed for primary crops, livestock and fish. For crops up to the first stage of processing and for livestock and fish products to the second stage. Higher stages of processing are not used because of the difficulty in procuring complete data on all components of processed products. Commodities are classified as major food groups and respective subgroups. Under each item primary as well as derived commodities up to the first processing are included (i.e. milk and butter) [BECKER and GILLIN, 2001].

A more extensive overview of commodities available and the commodities used in this study can be found in Annex 2.

Variables

The FAO describes in detail the supply and utilisation elements used in FBS. These are *Production, Changes in Stock, Gross Imports, Gross Exports, Feed, Seed, Food Manufacture, Waste, Other Uses*, and as a result of these *Supply, Food* and *Per Capita Supply* [BECKER and GILLIN, 2001].

The element *Production* is reported at the farm level for primary crops and livestock items, in terms of live weight for primary fish items. For processed items production is related to the total output at manufacture level.
The element *Changes in Stocks* describes changes occurring during the reference period at all levels from production to the retail stage with all involved

parties. In reality there is only limited information on these stocks. Calculating an average for several years reduces the risk of inaccuracy.
The element *Gross Imports* includes commercial trade, food aid, donations and estimations on unrecorded trade. Imports are usually more closely monitored by government agencies than exports because of taxes. Similar to imports *Gross Exports* are all movements of the item out of the country [BECKER and GILLIN, 2001].

There are various possibilities to define *Supply*. The elements *Production, Imports, Exports* and *Changes in Stock* are involved in the calculation. In recent years the following concept has been used to identify the available quantity of the food item in question:

$$Supply\ for\ Domestic\ Use = Production + Imports - Exports + Changes\ in\ Stocks$$

The variable *Feed* are quantities of the food item, domestically produced or imported, that are fed to livestock. Seed includes all of the commodity that is used for reproductive purposes (i.e. seed, sugar cane planted, eggs for hatching, fish for bait). If necessary seed data can be estimated from production data of the following year [BECKER and GILLIN, 2001].

Food Manufacture is the amount of the food item used to produce processed commodities, that are recorded in separate entries in FBS. The processed product does not always appear in the same food group. For example skim milk is in the Milk group, whereas butter is recorded under Animal Fats.
The element *Waste* includes all quantities of the commodity, that are lost at all stages between production and the households during storage and transportation but not losses during pre-harvest and harvest. Also covered are technical losses during the transformation into processed products. Post-harvest losses are caused through inadequate storage and also imbalances of supply and demand that causes food to be unsold. Untimely harvesting, improper packing and transport, cause losses of fruit and vegetables between 25% to 40%.

Other Uses describes quantities of the food item consumed by tourists, amounts used for the production of non-food purposes and also statistical discrepancies that are to be expected where data from many different sources is compiled.

The element *Food* includes all amounts of the food item that is available for human consumption and any products derived from the commodity only exempting milk where butter, cheese and other milk products are recorded separately. This element only describes quantities that reach the consumer but the amount that is actually consumed is with all probability lower depending on the degree of household losses.

The *Per Capita Food Supply* shows supplies available for human consumption during the reference period in terms of quantity, caloric value and protein and fat content. For the purpose of calculating the caloric value and the protein and fat content of the *Per Capita Food Supplies*, the choice of the appropriate food composition factors is very important. For example for wheat flour it depends on the water content, variety and degree of milling. *Per Capita Food Supply* figures only express the average supply available for consumption, not what is actually consumed. It is important to bear in mind that there can be major variations in level and pattern of consumption between individuals [BECKER and GILLIN, 2001].

There have been various formats of FBS developed over the years, and can still be used. There are three sample forms for FBS with different headings for the columns and a fourth format that is used to describe preparation processes of FBS [BECKER and GILLIN, 2001].

Preparation Procedures and Balance Construction

The FAO gives exact examples for the calculation of the presented data making it possible to comprehend the composition and also show how to use supplementary information to prepare reliable balances.

The first step of course is to search for and compile statistical data and supplementary information necessary for the balance preparation. A good deal of relevant information can be obtained from sources like marketing boards,

commercial processing industries, extension workers, merchants, agricultural agencies and others [BECKER and GILLIN, 2001].

Standardisation of FBS Data

FBS often end in a rather long list of food commodities, primary or processed. This is certainly useful for the calculation of *Per Capita Food Supply*, but such detailed information does no longer show a comprehensive picture of a country`s food supply. This problem can be solved by standardising the FBS to show only primary commodities. That means that processed commodities need to be converted into their primary commodity equivalent. Only sugar, oils, fat and alcoholic beverages should be included in the list even though they are processed commodities. The statistical information for processed commodities come nearly always from trade statistics. So trade in processed products should be expressed in the originating commodity equivalent to minimise the loss of information [BECKER and GILLIN, 2001].

The first standardising step is to bring processed products back to the originating commodities (i.e. flour to cereals, skim milk to milk). Therefore calories and nutrients from processed products are added to the calorie and nutrient values of the primary commodity. The resulting addition needs then to be subtracted from the element *Manufacture for Food*. This can be done for all processed products. For by-products there is only one subtraction necessary to cancel all processed inputs. For all corresponding elements (all except *Food*) entries are added to the primary commodity after multiplying by the reciprocal of the extraction rate. The element *Food* of the primary commodity is then recalculated using the new values [BECKER and GILLIN, 2001].

It is convenient to calculate the aggregate equivation for the whole balance sheet. But there may occur some conceptual problems. The first concerns the elimination of intermediate consumption and double-counting when products originate from the same primary commodity. The second possible problem is the choice of unit used for the conversion. These can be monetary values as well as nutritive values [BECKER and GILLIN, 2001].

2.3. Applicability of FBS for Nutrition Assessment

2.3.1. Advantages and Limitations of FBS

Advantages

FBS are a useful tool to show over-all trends in the food supply of a country, changes in dietary patterns and the degree of adequacy of food supply compared to nutritional demands. Thus being an important part of economic and nutrition studies.
FBS provide a detailed analysis and assessment of the food and agricultural circumstances in individual countries. Comparing food supply with import data shows the degree of a countries dependency on imports to fulfil the food demand (Import Dependency Ratio). Data on past food supply can also be used to analyse food demand and together with national income forecasts likely future developments can be generated, thus maybe influencing political decisions and development plans.
One FBS for one year and country can already show an expressive picture describing the health, development situation and trade of a country.

Combined with consumption data from household studies calorie figures from FBS can be used for estimations on the food distribution. Employing specified cut-off points, it is then possible to estimate the extend of a potentially malnourished population [FAO Statistics Division, 2009].

Limitations

Reliability, accuracy and coverage are all dependent on the underlying primary data which greatly differs in all those points. Factually, there are still lots of gaps in the statistics of the variables *Other Use, Feed, Seed, Manufacture, Stocks* and *Waste* that need to be identified. Estimations can then be calculated, averages for three to five years calculated and additional information can be obtained from statistical field surveys to close the gaps and thus improve the quality of the statistical data.

Furthermore FBS give no information on potential differences between varying social groups of a population, different regions of a country or seasonal differences of food groups. To adjust this disadvantage of FBS, complementary food consumption surveys should be carried out.

It is necessary to keep in mind that satisfactory availability of food does not automatically mean adequate consumption. FBS only describe the amount of food that reaches consumers; the quantity actually consumed is almost always lower than the supply due to losses during household storage, preparation and cooking [FAO Statistics Division, 2009].

2.3.2. Comparison of different Methods for Nutrition Surveys

Even though household surveys as well as FBS deliver data on supply and consumption, there can be significant differences between the resulting figures. The main reasons for this are different concepts, definitions and methodologies. The data obtained through FBS gives information on food supply, while household surveys can give two types of data; the income/expenditure/budget survey describes the amount of food that is available to a household, the second type gives information on the actual food intake [FAO Statistics Division, 2009].

FBS express the total quantity of food available for households and other non-household food distributors, without reflecting on the losses of edible food in these sites. Household surveys do not cover consumption in non-household sectors. And only specialised household surveys monitor losses and waste on a household level. Thus FBS data deliver more information than household surveys.

As already discussed FBS data depend on the underlying data. The quality of household survey data builds upon the magnitude of sampling and non-sampling mistakes.
Both kinds of data have their purposes and uses. Ideally they should be combined to present a complete picture of the nutrition situation in a country. While FBS give data on the national average of food supply and are suited to

estimate the overall shortages and surpluses in food supply they give no indication of the actual food intake of population groups in different regions of the country, people with different occupations, ages and income levels. Such information can be obtained from household surveys. If also the food eaten not at home is included in household surveys they provide an improved estimation of actual consumption [FAO Statistics Division, 2009].

The concept of food consumption data from household surveys differs somewhat from the concept used in FBS. For some commodities household surveys are more suitable to estimate consumption and thus survey data can be used as basic statistical data improving the quality if FBS. One great advantage of using survey data as supplementary data for FBS is the possibility to make an independent estimation of food availability and consequently improve reliability of FBS. Especially for the variables Waste and Stocks, FBS data is limited and household survey data can be integrated in the calculation and so make estimations more realistic.

Data from household surveys can also be used as an independent check on the per capita food availability in FBS. Differences between figures from household surveys and FBS should only be minimal and the overall trends should be very much alike [FAO Statistics Division, 2009].

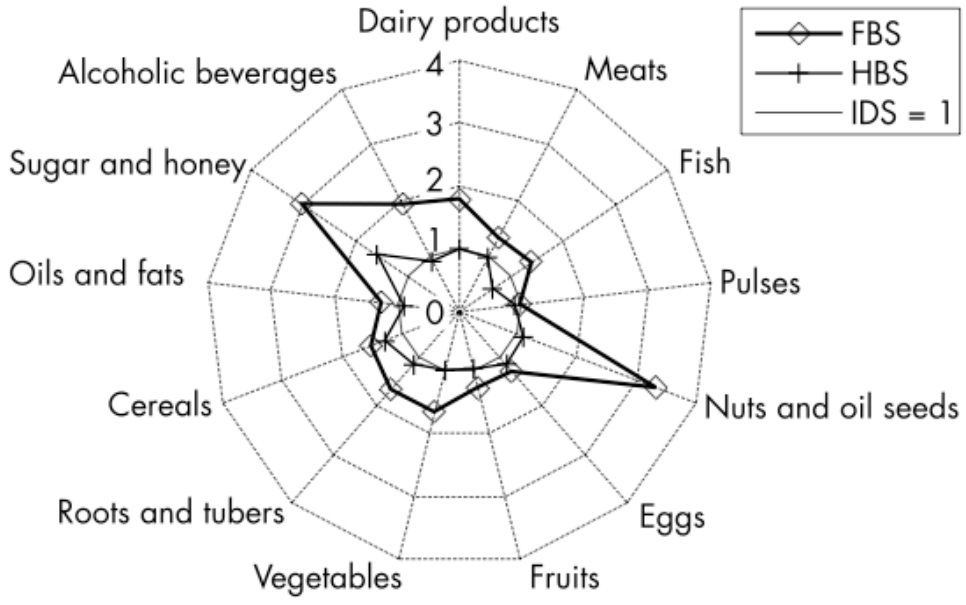
SERRA-MAJEM et al. (2003) did a comparative analysis of nutrition data from national, household and individual levels with data from Canada, Finland, Poland and Spain. They used data collected between 1990 to 1992 with FBS and HBS (household budget survey) as source for data on a national level and IDS (individual dietary data) at a regional level. The HBS were recordings for two weeks (Canada) and one week (Spain), and food lists over a three month period in Poland. For Finland there was no HBS data available. For the measurements of IDS, 24 hour recalls were used in Canada, Poland and Spain and a food record in Finland [SERRA-MAJEM et al., 2003].

FBS and HBS are easily comparable and reproducibility is high, while IDS can include several different methods, thus making comparison more difficult [SERRA-MAJEM et al., 2003].

IDS, when conducted appropriately, usually provide the best evidence on actual food intake and thus are optimal for assessing dietary patterns. However, being expensive and labour extensive, representative IDS are only done in a limited number of countries [NASKA et al., 2008].

Compared to home food consumption HBS usually overestimate consumption because of under-recording, food consumed by visitors and storage. Nevertheless results from HBS and IDS remain quite similar. Exceptions due to underestimations by HBS are for fish, meat, pulses and vegetables. On the other hand sugar, honey and cereals are clearly overestimated. FBS distinctly overestimate consumption; with pulses, cereals and oils and fats being closest to the determined consumption and nuts and oilseeds and sugar and honey being wide of the mark [SERRA-MAJEM et al., 2003].

Figure 2: Estimations of food availability (FBS and HBS) and consumption (IDS) in reference to IDS calculations for the four country average (Canada, Finland, Poland, Spain)

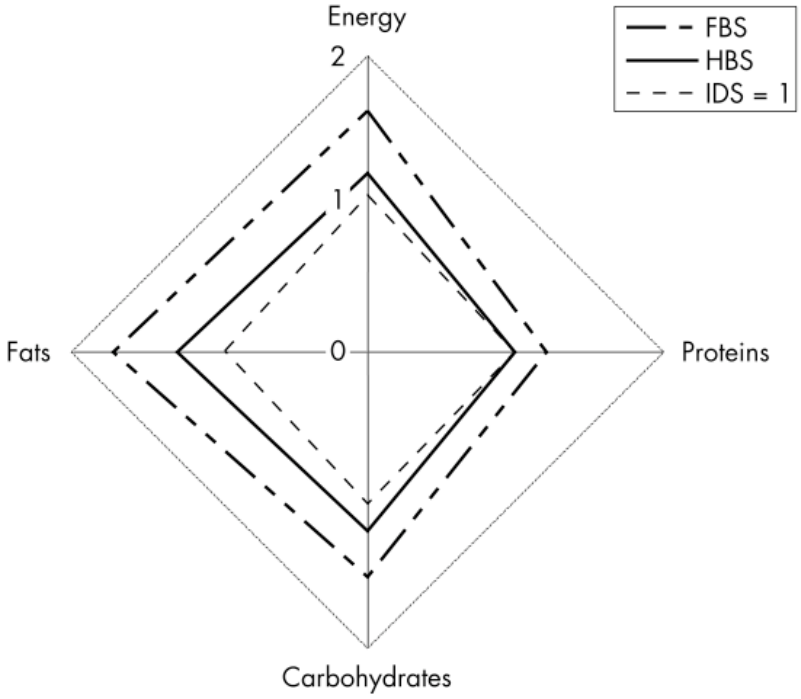


Source: Serra-Majem et al., 2003

The differences between FBS, HBS and IDS are caused by differences in method, the variety of indicators that are measured and the different population

groups that are analysed. While FBS and HBS describe a whole population of a country, IDS only analyse specified population groups or regions.
Usually food availability on a national level (FBS) is higher than on household level (HBS), which give higher estimates than IDS. The deviation between FBS and HBS may be explained by the fact that HBS do not include foodstuffs consumed in institutions and restaurants [SERRA-MAJEM et al., 2003].

Figure 3: Comparability between the three methods (FBS, HBS, IDS) for energy and macronutrient intake in reference to IDS calculations for the four country average



Source: Serra-Majem et al., 2003

An Austrian study on the comparability of direct and indirect methods to estimate food consumption by DÄMON and WIDHALM [2003] shows clear differences between FBS and consumption surveys. Especially the estimated energy-intake from FBS was with 3536 kcal per person far higher than the actually intake that was found to be between 1863 to 2365 kcal per person for the age group of 19 to 65 years.
The utilisation of food consumption data is strongly influenced by which nutrient database is used [DÄMON and WIDHALM, 2003].

Differences in study design and the method of data analysis reduce the comparability of results on an international level even more [NASKA et al., 2008].
While analysing results from FBS and consumption surveys the limitations of the different methods needs to be considered. Depending on the purpose of the conducted research the most adequate data source should be chosen. Preferably a combination of sources should be used to ascertain the greatest possible data quality and accuracy [DÄMON and WIDHALM, 2003].

In 2008 NASKA et al. published a metastudy using FBS and HBS data to analyse, to which extend these data correspond and estimated correlation to mortality statistics.
They used data from eighteen European countries, one year of FBS data for each and available HBS data between 1980 to 2000. Five food groups (vegetables, fruit, meat and meat products, legumes,fish and seafood) and olive oil were used for the analysis. Those food groups were chosen on the basis of epidemiological evidence that they have a noticeable impact on population mortality. The HBS data was standardised and all data brought to the same scale. Data on mortality was retrieved from the WHO „European mortality database“ and data on tobacco consumption from the WHO „Health for all database“. Estimates on the GDP by the International Monetary Fund were incorporated to allow for differences in prosperity between the countries.
To calculate correlation between FBS and HBS data Spearman coefficients were used. Partial rank correlation was estimated between overall mortality, and specifically coronary and total cancer mortality, and the various food groups [NASKA et al., 2008].

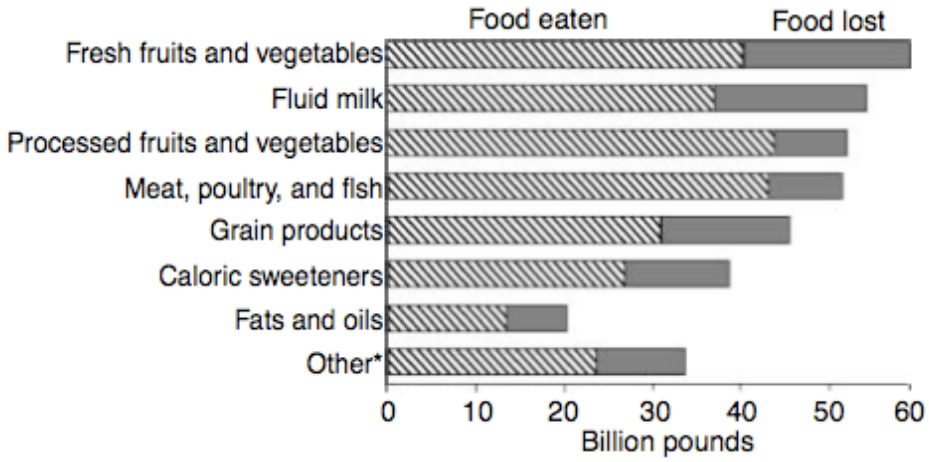
Supply data (from FBS) are expectedly higher than availability (from HBS). Should HBS data be higher than FBS values, differences can be accredited to household production, which is not included in FBS. Even so, the correlation between FBS data and HBS data is distinct with the Spearman coefficient ranging from + 0.69 for fish and seafood to +0.93 for olive oil thus providing support to the adequacy of data from both data sources. Only for meat and meat products the coefficient was lower at +0.39, probably because meat and meat products often are eaten outside the household and thus are not included

in HBS. The two data sources provide valuable information and compliment each other. Combination of the two sources may improve the estimation of a reliable value. Whilst IDS are demanding to undertake and replicate with standardised methods, FBS are likely to remain valuable sources on long-term nutrition trends, their sociodemographic determinants and health implications [NASKA et al., 2008].

2.3.3. Estimating Food Intake with FBS Data

To avoid an overestimation of food intake, losses after the retail level need to be considered. Losses are expected to be positively correlated to the total of energy supply and thus are higher in developed than developing countries. Empirical estimates based on US household analysis suggest considerable differences in losses of varying commodities [SCHMIDHUBER and TRAILL, 2005].

Figure 4: **Losses by commodity, USA, 1995**



Source: SCHMIDHUBER and TRAILL, 2005

The largest losses were in fresh fruit and vegetables, fluid milk and grain products.

Factors to estimate the actual intake with FBS data were first mentioned by Erard et al. in 1986 and since used in various articles (i.e. Österreichischer Ernährungsbericht 2003).

Table 1: Cut-off point of various food groups to estimate food intake

Food Group	Reduction in the first step
Cheese	- 3%
Butter	- 30%
Oil and fat	- 31%
Pig meat	- 29.5%
Beef	- 33%
Veal	- 35.5%
Poultry meat	- 40.5%
Other kinds of meat	- 32.5%
Fruit	- 27%
Reduction in a second step	
all food groups	- 15%

Source: ELMAFA et al., 2003

These cut-off points consider all the possible factors minimising the amount of food after the consumer acquired it, also including plate-waste and pet-food delivering a realistic figure [ELMADFA et al., 2003].

2.3.4. Use of FBS in the Construction of a Consumer Similarity Index

In a study on diets in the European Union and the relation to nutrition recommendations by the WHO and FAO, SCHMIDHUBER and TRAILL [2004] calculated the similarity of diets in the different countries of the EU, using FBS data. They defined the consumption similarity index (CSI) as

$$CSI_{j,k} = 1 - \frac{1}{2}\left(\sum_{i=1}^{426}\left|\frac{Cal_{ij}}{Cal_j} - \frac{Cal_{ik}}{Cal_k}\right|\right)$$

with i = 1 to 426 food items of the FAO`s database; Cal_{ij} and Cal_{ik} describe the energy from varying foodstuffs i in countries k and j; and Cal_j and Cal_k describe the total energy per person in country j and k. The CSI can vary from 0 to 1 or in percent from 0 to 100. The CSI thus symbolises an aggregate measure for the overlap in food consumption patters of two different countries based on the energy content of food items [SCHMIDHUBER and TRAILL, 2004].

2.3.5. Import Dependency Ratio and Self-Sufficiency Ratio

To analyse the food situation in a country it is important to assess how much of the available food has been imported.
For this purpose the Import Dependency Ratio (IDR) can be calculated, which is defined as:

$$IDR = \frac{\mathrm{Im}ports}{(Production+\mathrm{Im}ports-\mathrm{E}xports)} x100$$

It needs to be kept in mind, that this ratio is only reliable if imports are used for domestic utilisation and are not re-exported [BECKER and GILLIN, 2001].

Analogous, the calculation of the Self-Sufficiency Ratio (SSR) that expresses the extent of Production in relation to domestic use:

$$\mathrm{SS}R = \frac{Production}{(Production+\mathrm{Im}ports-\mathrm{E}xports)} x100$$

Just as the IDR the SSR can be expressed for individual food items after appropriate conversion.
The SSR plays an important role in assessing the food security of a country and is often used to indicate how much a country can rely on it`s own resources to fulfil domestic demand [BECKER and GILLIN, 2001].

2.4. Dietary Patterns and Trends in Europe

FBS data are an essential part of economical planning due to their ability of giving a reliable overview of food and nutrient supply. Per-capita-supply data combined with a food composition database can be used to estimate available nutrients per person and day. Furthermore supply data can be brought into context with morbidity and mortality data and compared internationally [KIEFER et al., 2002].

2.4.1. Nutrition and Diseases

A WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases [2002] found, that the growing epidemic of chronic disease in developed and developing countries was related to dietary and lifestyle changes. During the past decade new scientific insights identified specific dietary components that increase the probability of occurrence of diseases in individuals and also interventions to modify their impact. Rapid changes in diets and lifestyles that took place with industrialisation, urbanisation, economic development and market globalisation have a significant impact on the health and nutritional status of populations. Food availability has expanded and is more diversified. But also negative consequences in terms of inappropriate dietary patterns and a corresponding increase in diet-related chronic diseases was observed [WHO, 2002].

Increased consumption of energy dense diets high in fat, especially saturated fats, and low in unrefined carbohydrates was noted. These changes in dietary and lifestyle patterns causes an increase in chronic non-communicable diseases like obesity, diabetes mellitus, cardiovascular disease, hypertension, stroke and some kinds of cancer and thus cause disabilities and premature death [WHO, 2002].

Nutrition is quickly becoming a major factor of chronic disease. Scientific evidence strongly suggests that alterations in diets have a great impact, positive or negative, on health [WHO, 2002].

Epidemiological literature indicates that the intake of fruit, vegetables and legumes may be inversely associated with total mortality, coronary mortality and total cancer mortality.
Fish and olive oil are likely to be inversely associated with coronary mortality. Since coronary mortality account for about half of the total mortality rate, fish and olive oil seem to be inversely associated with overall mortality. For olive oil there is some evidence on the inverse association with breast cancer, colorectal cancer and in context with the Mediterranean diet, to overall mortality.
For meat and meat products there is strong evidence for a positive association with colorectal cancer. Though colorectal cancer makes only under ten percent of the total cancer rate [NASKA et al., 2008].

NASKA et al. [2008] conducted a calculation of the correlation between dietary data (from FBS and HBS) and overall mortality, coronary mortality and total cancer mortality. For vegetables (including legumes), fruit, olive oil, fish and seafood data from FBS and HBS indicate an inverse association with all three mortality indices [NASKA et al., 2008].

2.4.2. European Diets in Relation to Nutrition Recommendations

SCHMIDHUBER and TRAILL [2005] analysed dietary patterns and their changes over time in the European Union (EU 15), in relation to the recommendations of a WHO/FAO expert consultation using FAOSTAT FBS linked to a food composition database to convert food items to nutrients. Data from fifteen European countries was compared to values of the USA and the world [SCHMIDHUBER and TRAILL, 2005].

Table 2 describes improvements and deteriorations in nutrient supply according to the recommendations. Criterions are the recommended dietary intake ranges as a share of total energy intake.

Table 2: European countries that meet the recommendations

Nutrient/food item	Criterion	Number of countries meeting the recommendation in (3-year average): 1961–1963	1969–1971	1979–1981	1989–1991	1999–2001
Total protein	>30%	0	1	1	1	1
	<15%	0	0	0	0	0
Fat	>30%	10	10	13	14	14
	<15%	0	0	0	0	0
Saturated fatty acids	>10%	9	10	11	13	12
Polyunsaturated fatty acids	<6%	12	12	7	6	5
	>10%	0	0	0	0	0
Carbohydrates	<55%	8	12	13	14	14
	>75%	0	0	0	0	0
Cholesterol	>300 mg person^{-1} day^{-1}	10	10	13	14	14
Fruits and vegetables	>400 g person^{-1} day^{-1}	6	9	9	12	14
Sugar	>10%	8	11	10	9	10

Source: SCHMIDHUBER and TRAILL, 2005

The number of countries that reached or even exceeded the individual goal of 400 g intake per person and per day for fruit and vegetables has increased steadily from only six countries in 1961-1963 to fourteen countries by 1999. The number of countries not reaching the limit of 6% for polyunsaturated fatty acids declined from twelve to five. Nonetheless the countries with national averages above the recommended 300 g cholesterol limit and the 30% level for total fat increased from 10 countries to all of the EU15.
Even though the intake of saturated fats, cholesterol and sugar increased in Mediterranean countries in the observed time period, in some northern countries availability of saturated fat and sugar declined. This suggests that healthy eating guidelines may finally have an impact on diets [SCHMIDHUBER and TRAILL, 2005].

Epidemiological data strongly suggests a protective effect of a high intake of fruit and vegetables against various neoplasms, especially the respiratory and alimentary tract. An inverse association between fruit and vegetable intake and CHD, stroke, cataracts and birth defects can be observed. In 1990 the WHO has set the lower per capita limit, at an international level, of fruit and vegetable consumption to 400 g/d [NASKA et al., 2000].

NASKA et al. [2000] examined the fruit and vegetable consumption patterns of ten European countries with this recommendation, estimating intake based on HBS data from the Data Food Networking database (DAFNE) to identify the percentage of low consumers. On the basis of US guidelines, and with the

assumption that an average sized portion of vegetables and fruit is about 80g, a minimum consumption of three servings of vegetables and two servings of fruit corresponds to approximately 250 and 150 g/d respectively. Based on these factors the percentage of individuals whose daily intake did not exceed these limits were estimated by the participating countries using HBS data [NASKA et al., 2000].

It is necessary to keep in mind that NASKA et al. [2000] used HBS data to calculate availability, contrary to the supply which is calculated with FBS data and usually exceeds the availability (see above).

There are considerable disparities in fruit and vegetable availability among the populations. Only in Greece and Spain does the mean daily population intake of fruit and vegetables decidedly exceed the 400g/d recommendation. In Luxembourg the daily availability is just above the recommended level. The lowest value was estimated in the Republic of Ireland. Belgium and Hungary are close to the recommended goal of 400 g/day/person but do not reach it. Though the low fruit and vegetable availability in those two countries has different causes; the Belgian population seemingly prefers fruit, while the Hungarian population prefers vegetables [NASKA et al., 2000].

Table 3: Percentage of low consumers of plant foods, ten European countries, 1990

Country	Fruit and Vegetables < 400 g/person per d*	Fruit < 150 g/person per d	Vegetables < 250 g/person per d
Belgium	68	42	85
Germany	69	45	88
Greece	37	32	56
Hungary	72	66	76
Republic of Ireland	88	78	90
Luxembourg	62	41	83
Norway	81	55	93
Poland	78	81	75
Spain	49	30	76
UK	76	68	81

Source: NASKA et al., 2000

The percentage of low consumers (intake: fruit < 150g, vegetables < 250g) in the ten participating countries is presented in Table 3. As expected, the Mediterranean countries Greece and Spain had the lowest percentages. Although even in those countries the percentage of under-consumers should not be neglected. The other countries vary between 62% (Luxembourg) and 88% (Republic of Ireland) [NASKA et al., 2000].

More than 50% of all populations surveyed were likely to consume less than the recommended vegetable intake, even the two Mediterranean populations. Six of ten countries (Belgium, Germany, Luxembourg, UK, Ireland, Norway) show 80% vegetable under-consumers, although in Ireland and Norway low consumption seems to be a general dietary pattern and not caused by underprivileged parts of the population [NASKA et al., 2000].

All surveyed populations presented a clear difference between fruit and vegetable availability. In almost all cases, the percentage of low fruit consumers were significantly lower than those of low vegetable consumers. This indicates a preference to fruit consumption of European populations. Differences were less pronounced in Ireland, UK and Hungary. Poland was the only country where vegetable under-consumers were fewer than fruit under-consumers. This implies the necessity of specific recommendations and targeted interventions for vegetables [NASKA et al., 2000].

Some epidemiological studies and intervention trials, like the Seven Countries Study [KEYS et al., 1980] in the late 1970s and the MONICA project [http://www.ktl.fi/monica/], which started in the early 1980s and is still ongoing, suggest that a „Mediterranean diet“ works as a protective factor against various major diseases (ischaemic heart disease, certain types of cancer and others), and thus increase life expectancy. Though there is no exact definition of a Mediterranean food pattern, significant features are a high intake of vegetables, legumes, fruit, nuts and unrefined cereals, a high intake of olive oil, a low intake of saturated fatty acids, a moderately high intake of fish, a low to moderate intake of dairy products (mainly cheese and yoghurt), a low intake of meat and a regular but moderate intake of wine [BALANZA et al., 2006].

To assess food pattern changes in Europe over the last 40 years and to compare the stability of the traditional Mediterranean food diet in the southern countries BALANZA et al. [2006] conducted an ecological study on the basis of FBS for three geographical regions of Europe (Mediterranean: Spain, Portugal, Italy, Greece, France, Cyprus, Albania; Northern Europe: UK, Sweden, Norway, Finland, Germany, Ireland, Denmark, Iceland; Eastern Europe: Czech Republic, Slovakia, Poland, Bulgaria, Hungary, Romania) over two time periods: 1961-1963 and 1998-2000. The average food availability was calculated for the two three year periods and the figures weighed according to the number of inhabitants in each country at that time [BALANZA et al., 2006].

The trends that could be observed in the three country groups were similar. Total energy and percentage energy available from fat considerably increased, while the percentage energy from carbohydrates has fallen and that of protein stayed almost constant. Those changes were even more pronounced in Mediterranean countries. A strong decrease of available energy from cereals and wine could also be observed in Mediterranean countries. Nevertheless Mediterranean countries still retain some of their traditional traits like greater energy availability from olive oil, greater energy availability from wine vegetables, fruit, nuts and legumes, and lower energy availability from sweets [BALANZA et al., 2006].

Table 4: Total energy availability and percentage of energy availability from fat, protein, carbohydrate and alcohol per capita per day

	Mediterranean		Northern Europe		Eastern Europe	
	1961–1963	1998–2000	1961–1963	1998–2000	1961–1963	1998–2000
Total energy (kJ)	12343 ± 1046	14819 ± 753	12765 ± 794	14070 ± 439	13292 ± 786	13602 ± 828‡
Total fats (%)	26.4 ± 3.1	39.1 ± 2.8	36.9 ± 1.5*	38.3 ± 1.2	23.8 ± 3.8§	29.9 ± 3.7*,§
Vegetable	12.9 ± 3.7	18.8 ± 4.1	10.4 ± 2.4	16.3 ± 2.1	6.9 ± 2.3‡	12.2 ± 1.8‡
Animal	13.5 ± 6.1	20.3 ± 4.9	26.5 ± 3.0*	22.0 ± 1.3	17.0 ± 5.3‖	17.7 ± 3.1
Total protein (%)	11.9 ± 0.7	12.9 ± 0.3	11.3 ± 0.4	11.7 ± 0.6†	11.6 ± 0.4	11.8 ± 0.6‡
Vegetable	6.8 ± 0.9	5.1 ± 0.6	4.7 ± 0.2*	4.8 ± 0.3	7.2 ± 1.1§	6.0 ± 0.9‖
Animal	5.1 ± 1.4	7.7 ± 0.8	6.6 ± 0.4	6.9 ± 0.6	4.4 ± 0.9‖	5.8 ± 0.5†
Carbohydrates (%)	54.5 ± 5.3	43.3 ± 3.4	46.9 ± 1.5†	43.5 ± 1.6	61.2 ± 4.1§	53.4 ± 4.3*,§
Total ethanol (%)	7.2 ± 2.1	4.8 ± 1.0	4.9 ± 1.2	6.5 ± 1.3	3.4 ± 1.2†	5.0 ± 1.4
Wine	5.8 ± 1.6	2.6 ± 0.6	0.4 ± 0.3*	1.0 ± 0.3*	0.8 ± 0.8*	0.7 ± 0.6*

Source: BALANZA et al., 2006

Factor analysis to define food patterns and cluster analyses, also using the Mediterranean Adequacy Index (MAI), show that the food habits of

Mediterranean countries have deviated greatly from the traditional pattern of the 1960s and have tended to align with the food pattern typical for northern countries. Most significant is the fall in availability of carbohydrates and the increase in the availability of fats, especially of animal origin. Therefore, this study shows that food availability in Mediterranean Europe and Eastern Europe has largely converged with the Northern European food pattern. This confirms the partial abandonment of the traditional Mediterranean diet in Southern European countries; an undesirable trend implying the necessity of nutrition policy action [BALANZA et al., 2006].

2.4.3. Similarity of Dietary Patterns in the European Union

As mentioned in chapter 2.3.4. SCHMIDHUBER and TRAILL [2005] analysed the growing similarity of European diets using a Consumption Similarity Index (CSI). This CSI provides a single number to measure dietary overlap between two countries based on the energy content of food items. The calculations were undertaken at the lowest possible level of aggregation (426 food items) for all of the EU 15 individually, the EU average, the USA and the world as a whole to compare [SCHMIDHUBER and TRAILL, 2005].

As expected, the diets of the EU countries are and have been more similar to the EU average than to the US diet. Within the EU, the consumption similarity has generally increased, especially for the Mediterranean countries (i.e. Greece, Portugal, Spain). However, in the late 1960s diets of some European countries were more similar to the USA, than to each other or the European average. This no longer applies; in fact, the EU average is less similar to the USA in 2000 than in the early 1960s. For example the similarity between Denmark and Greece nearly doubled in the last four decades [SCHMIDHUBER and TRAILL, 2005].

The CSI data also determine geographic proximity as an traditional determinant of similarity in food consumption. High similarities between geographic neighbours like Germany and Austria could always be expected. In the same way are low CSI values an intuitive outcome of geographic distance. Yet, over time, the importance of proximity in explaining similarities has declined. As trade

barriers and transportation costs have declined and economic integration has proceeded, the influence of distance has been fading. Thus, the analysis of CSI data confirms a growing similarity between the food consumption patterns of the countries in the European Union. EU diets have become more homogeneous and are also differentiable from dietary patterns from outside the EU. A distinctly European diet might be emerging [SCHMIDHUBER and TRAILL, 2005].

Attempting Cluster Composition for European Countries on the Basis of FBS

As nutrition intervention is based on data from current population diets, food policy makers might find it convenient to use dietary goals from strongly similar countries as a blueprint for other countries with less experience in the area [PETROVICI et al., 2005].

In 2005, PETROVICI et al. investigated the heterogeneity of food consumption patterns in Europe (countries of the European Union plus Norway, Switzerland), using the FAO FBS, relying on the analysis of the structure of calorie, protein and fat consumption and the consumption of staple food items. Main dimensions of consumption were identified based on factor analysis, and then used for the purpose of clustering countries. Also the relation between income and food consumption is explored.

Clusters based on patterns of calorie consumption were constructed, emphasising the contribution of food groups to the average per capita and per day supply of calories, protein and fat. Furthermore clusters based on patterns of food consumption were established [PETROVICI et al., 2005].

PETROVICI et al. found [2005] that France does not belong to the Mediterranean cluster as far as calorie consumption patterns are concerned. Calorie Consumption patterns also suggest that Belgium-Luxembourg and the UK merged; Norway with Sweden and Austria with the Netherlands. Denmark systematically shows as an entropy group. Germany and Austria, which are to be expected to be in the same cluster because of their geographical location, merge based on their similarity of fat consumption. Portugal and Spain are grouped together based on their protein consumption. The Scandinavian

Countries, Norway and Sweden, have great similarity in per capita food consumption. Greece shows greater similarity to Cyprus, than Italy; and the Baltic States are clustered with the Scandinavian Countries [PETROVICI et al., 2005].

Post socialist countries start to draw close to countries from Western Europe as their dietary patterns become more similar, and further harmonisation is expected in the future. But only clusters based on patterns of energy or nutrient intake remain stable across classification methods between Eastern and Western Europe. Increasing similarity in marketing environments has been outlined; several demographic and cultural trends, like an ageing population and health concerns in dietary choice, found in Western Europe became more visible in Eastern Europe. An increased similarity in food consumption patterns may occur when Southern and Eastern European Nations catch up with Northern European development [PETROVICI et al., 2005].

3. Material and Methods

3.1. Material

This study was conducted with FBS data from the current 27 member countries in 2009 of the European Union, downloaded from the FAOSTAT homepage [http://faostat.fao.org/]. In this study European Union always refers to the member states of the European Union in 2009.

The earliest available data are from 1961; the most recent data available in August 2009 is from 2003. The complete available dataset for the timeperiod between 1961 and 2003 has been used for this analysis. Not for all countries was the whole set of data from 1961 to 2003 available. A comprehensive list of the countries and the respective available time period can be found in Annex 1. Belgium and Luxembourg are special cases. Data for both countries is combined till 1998, from this point on Belgium has it‘s own dataset and there are no available data for Luxembourg.

The fact that six of the countries only have data accessible starting from 1992 or 1993 needs to be kept in mind when viewing the figures. Some irregularities at this point in time may be ascribed to this information.

When working with FBS, their limitations and possibilities need to be kept in mind. While they can not give information on different risk groups in a country, seasonal changes of supply and other details, they do give a comprehensive overview of the development in supply.

It is necessary to stress the fact, that supply data is not equivalent of the actual food intake, but shows, what amount of food is theoretically available in a country, and thus an estimation if the intake recommendation could be reached is possible.

The limitations and possibilities of FBS have been discussed in detail in previous chapters.

The complete data set was imported into SPSS (Statistical Software Package). While analysing the data only a limited number of variables and commodities were actively used.

3.1.1. Variables

The variables that were employed in this study were *Items*, *Country, Years, Food/Capita/Year* (kg), *Calories/Capita/Year* (kcal), *Proteins/Capita/Year* (g) and *Fat/Capita/Year* (g).

In the calculation of these variables the home production by households for their own consumption is not included. In some countries this is a considerable part of the total production [BECKER and GILLIN, 2001].

3.1.2. Commodities

The provided data set from the FAO includes a widespread selection of commodities. This study concentrates for one on the three summarising main groups: *Grand Total, Vegetable Products* and *Animal Products*; and secondly on specific food groups: *Cereals* (excluding beer), *Potatoes, Sugar and Sweeteners, Pulses, Oil crops, Vegetable Oils* (emphasising olive oil), *Vegetables, Fruit* (excluding wine), *Alcoholic Beverages* (emphasising wine and beer), *Bovine Meat, Mutton and Goat Meat, Pork, Poultry Meat, Animal Fats, Milk* (excluding butter), *Eggs* and *Fish and Seafood*.

Table 5: List of Commodities classified by Major Food Groups

Fruit	Melons, Watermelons, Apples, Apricots, Avocados, Cherries, Figs, Grapes, Mangoes, Papaya, Peaches, Pears, Persimmons, Pineapples, Plums, Quinces, Blueberries, Cranberries, Gooseberries, Raspberries, Strawberries, Kiwi,

	Other Fruits (fresh), Dates, Figs (dried), Prunes, Currants, Raisins, Other dried fruits
Vegetables	Beets, Carrots, Turnips, Rutabagas or Swedes, Onions (green), Onions (dry), Artichokes, Tomatoes, Asparagus, Cabbage, Cauliflower, Celery, Kale, Lettuce, Spinach, Beans (green), Broad Beans (green), Chilli peppers, Garlic, Cucumbers, Mushrooms, Eggplant, Peas (green), Pumpkins, Squash, Gourds, Okra, Radishes, Other vegetables
Cereals	Wheat Rice (paddy), Barley, Maize, Rye, Oats, Millet, Sorghum, Rice, Quinoa, Mixed grains, Buckwheat, Cereals other
Sugar and Sweeteners	Sugar (raw equivalent), Sweeteners (other), Honey
Oil crops	Soybeans, Coconatus (incl. copra), Oil palm fruit, Groundnuts, Olives, Rape and mustard seed, Sunflower seed, Cottonseed, Linseed, Hempseed, Sesame seed, Other oilcrops
Vegetable Oils	Rape and mustard seed oil, Sunflower seed oil, Cottonseed oil, Linseed oil, Hempseed oil, Sesame seed oil, Copra and coconut oil, Palm kernel oil, Palm oil, Soybean oil, Olive oil, Maize oil
Animal Fats	Butter, Ghee, Other animal fats, Fish liver oil, Whale oil
Red meat	Beef and veal, Pig meat, Mutton and lamb, Goat meat
Poultry	Chicken meat, Goose meat, Duck meat, Turkey meat
Fish and Molluscs,	Freshwater fish, Demersal fish, Pelagic fish, Crustaceans,
Seafood	Aquatic mammals meat, Aquatic plants
Milk	Cow Milk, Goat Milk, Sheep Milk, Buffalo Milk, Skim Milk, Evaporated (unsweetened, whole),Condensed (sweetened, whole), Evaporated (unsweetened, skim), Condensed (sweetened, skim), Dried (whole), Dried (skim), Cream, Cheese, Hard Cheese, Semi-Soft Cheese, Soft Cheese
Eggs	Hen eggs, Other eggs

Source: FAO, 2003

A more detailed list of actual accessible commodities in FBS from the FAO can be found in Annex 2.

Not for all countries is the data set conform. Some countries record additional commodities (i.e. aquatic plants, yams and ricebran oil); while some countries did not collect data for usually available commodities (i.e. fish-body oil, fish-liver oil, aquatic products other, aquatic animals other, plantains, sweet potatoes, sugar cane, etc.). All missing or additional items are subgroups of others and are not used singularly, so their missing is insignificant.

3.2. Methods

3.2.1. Calculating new Variables and Commodities

For the analysis of the data, some new variables and commodities were calculated.

New Variables

The given variables *Food/Capita/Year* (kg), *Protein/Capita/Day* (g) and *Fat/Capita/Day* (g) were used to calculate the new variables *Calories from Protein/Day* (kcal), *Calories from Fat/Day* (kcal) and *Calories from Carbohydrates/Day* (kcal).

The commodity *Calories from Protein/Day (kcal)* is composed of the commodity *Protein/Capita/Day* (g) multiplied by 4.
The commodity *Calories from Fat/Day (kcal)* is composed of the commodity *Fat/Capita/Day* (g) multiplied by 9.

Since there is no variable Carbohydrates/Capita/Day (g), it is necessary to convert the variable *Food/Capita/Year* from kg to g and year to day, and then subtract *Protein/Capita/Day* and *Fat/Capita/Day* to get this variable. Next the newly obtained number is multiplied by 4 to reach the sought after variable *Calories from Carbohydrates/Day*.

New Commodity - Red Meat

To acquire the new commodity *Red Meat* the already given commodities *Bovine Meat*, *Pig Meat* and *Mutton and Goat Meat* are used and the figures of the corresponding variables are summed up.

3.2.2. Calculation for the Vegetal-Animal Ratio

To calculate a ratio between vegetal and animal food items for chapter 4.2.7. the commodities Vegetal Products and Animal Products, and the variable Food Consumption (kcal/capita/day; kcal) was used:

Vegetal Products (kcal)/Animal Products (kcal) = Vegetal-Animal Ratio

3.2.3. Calculating the Consumer Similarity Index (CSI)

The CSI was calculated in Microsoft Excel using the method established by SCHMIDHUBER and TRAILL:

$$CSI_{j,k} = 1 - \frac{1}{2}\left(\sum_{i=1}^{426}\left|\frac{Cal_{ij}}{Cal_j} - \frac{Cal_{ik}}{Cal_k}\right|\right)$$

with i = 1 to 426 food items of the FAO`s database; Cal_{ij} and Cal_{ik} describe the energy from varying foodstuffs i in countries k and j; and Cal_j and Cal_k describe the total energy per person in country j and k [SCHMIDHUBER and TRAILL, 2004].

For the calculation the main food groups and selected subgroups were used to compare the countries:
cereals, potatoes, sugar and sweeteners, pulses, oil crops, vegetable oils, vegetables, fruit, alcoholic beverages, wine, beer, poultry meat, animal fats, milk, eggs, fish and seafood, red meat, bovine meat, mutton and goat meat and pig meat.
The applied variable was *Calorie/Capita/Day* (kcal).
Each food commodity was divided by the commodity *Grand Total*.

The CSI was calculated for all available European countries for the years 1961, 1973, 1983, 1993, 2003.

4. Results and Discussion

In the following chapter trends of supply in major food groups will be presented, and the results will be discussed and compared to international public health goals from the „Report of Food Nutrition, Physical Activity, and the Prevention of Cancer“ published by the American Institute for Cancer Research [AICR, 2007], respectively the recommendations in a report of a WHO/FAO Joint Expert Consultation: „Diet, Nutrition and the Prevention of Chronic Diseases“ [WHO/FAO, 2002].

Public health goals are rarely a defined single value, but rather a range of population averages that are consistent with the maintenance of health. When actual population averages are outside of this range, health implications are probable [WHO/FAO, 2002].

Contrary to public health goals, which are determined with the aim to increase health in a population and are often followed by governmental actions, individual health goals are defined as suggestions for individuals to support a healthy lifestyle [WHO/FAO, 2002].

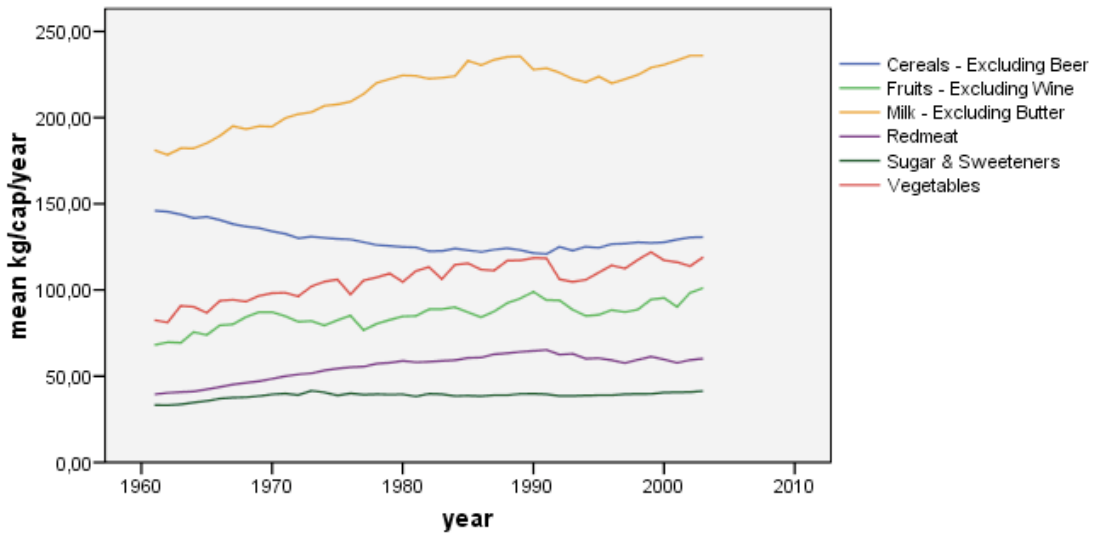
In the first chapter Average Trends in Supply of Food Groups, 23 commodities of the plant and animal sector (see Annex 2) are analysed. Firstly a summarising overview over all commodities will be given. Followed by a detailed analysis of each commodity, including additional calculations; for example an vegetal/animal-ratio or proportions of food commodities comparing them to related commodities.
Proportions of macronutrients will also be discussed.
The already mentioned harmonisation of European countries will be analysed more thoroughly with the Consumer Similarity Index at the end of this chapter.

It is not part of this study to analyse political or other causes for levels of supply.

4.1. Average Trends in Supply of Food Groups

Fig. 5 shows the development in the average food supply of all countries that are part of the European Union in 2009, for the commodities cereal, fruit, milk, red meat, sugar and sweeteners and vegetables to show an overview of basic trends. The supply changes will be discussed in detail for each commodity later on. Annex 3 shows the same food commodities calculating the supply by kcal/ capita/day.

Figure 5: Trends in Average Food Supply of Cereal, Fruit, Milk, Red Meat, Sugar & Sweeteners, Vegetables in kg/cap/year in the European Union



Source of raw data: FAO, 2008

While the supply of cereal has been decreasing till 1990, supply has been stabilised since then and even slightly increased, but values are still lower in 2003 than in 1961.

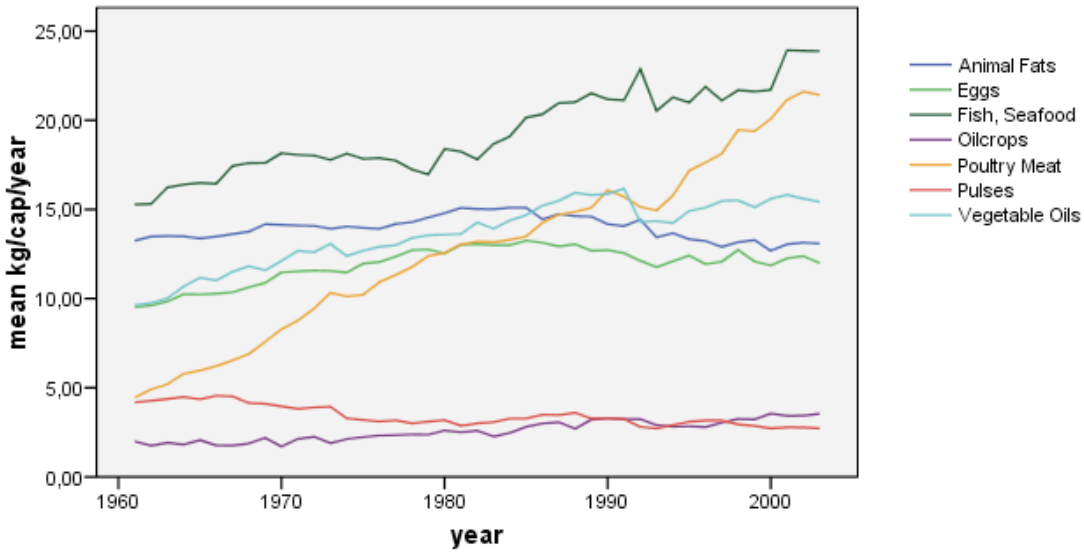
Vegetables and fruit supplies are fluctuating but nevertheless showed an increasing trend.

Milk supply reached a peak in 1988, decreased slightly but is already on an increasing trend again in 2003.

Red meat increased till a stabilisation in 1992, while sugar and sweeteners show only a very small but ongoing increasing trend.

In Fig. 6 the commodities of the average supply of animal fat, eggs, fish and seafood, oilcrops, poultry meat, pulses, vegetable oils in the European Union are presented. Annex 4 shows the same food commodities calculating the supply by kcal/capita/day.

Figure 6: Trends in Average Food Supply of Animal Fats, Eggs, Fish & Seafood, Oilcrops, Poultry Meat, Pulses, Vegetable Oils in kg/cap/year



Source of raw data: FAO, 2008

The most obvious increase can be recognised in the poultry meat supply, which increased by 320% from 1961 (5 kg/capita/year) to 2003 (21 kg/capita/year). Fish and seafood supply increased very clearly, though not so strongly.
While animal fats in 2003 are on the same value as in 1961, regardless of changes overtime, vegetable oils clearly increased since then. Oilcrops show only a very slight increase.
Pulses show a low decrease and eggs increased slightly. Supply can be regarded as stable.

In table 6, the average changes in the supply of the main food groups of the countries of the European Union are presented in numbers.

Table 6: Changes of the Average Food Supply of Main Food Groups in the European Union between 1961 and 2003

	1961 [kg/capita/year]	2003 [kg/capita/year]	Change in kg	Change in %
Fruit	68	101	+33	+49
Vegetables	82	119	+37	+45
Potatoes	97	82	-15	-15
Cereals	146	131	-15	-10
Pulses	4	3	-1	-25
Milk	178	236	+58	+33
Egg	10	12	+2	+20
Sugar	33	41	+8	+24
Oilcrops	2	3,5	+1,5	+75
Vegetable Oil	10	15	+5	+50
Animal Fats	13	13	0	0
Bovine Meat	15	16	+1	+7
Pork	21	41	+20	+95
Mutton/Goat Meat	3	3	0	0
Red Meat	40	60	+20	+50
Poultry	5	21	+16	+320
Fish and Seafood	15	24	+9	+60
Beer	38	77	+39	+103
Wine	26	21	-5	-19
Alcoholic Beverages	69	105	+36	+52

Source: FAO, 2008; own calculations

In the next chapter these changes in the above mentioned food groups will be discussed in detail.

4.2. Analysis of Trends in Individual Food Groups

4.2.1. Supply of Vegetables, Fruit and Potatoes

The supply of these commodities will be described especially detailed because of their significance for a healthy lifestyle.

The Vegetable Supply from 1961 to 2003

In 1961 the average supply of vegetables in the European Union was 82 kg/capita/year, increasing by 45% to an average of 119 kg/capita/year in 2003. In Annex 6 a complete list of the vegetable supply in the European Union in 1961, 1993 and 2003 in numbers is available.

In 2003 the highest supply of vegetables by far could be observed in Greece with 276 kg/capita/year. Then follow Portugal (181 kg/capita/year), Romania (180 kg/capita/year), Italy (178 kg/capita/year) and Cyprus (169 kg/capita/year). The lowest supplies of vegetables in the European Union can be found in Slovakia (70 kg/capita/year), Finland (71 kg/capita/year), Czech Republic (72 kg/capita/year), Slovenia (73 kg/capita/year) and in the Netherlands (73 kg/capita/year).

The highest supply throughout the years shows up in *Greece* in 1985 with 301 kg/capita/year. Greece was in general the country with the highest supplies, starting in 1961 with 115 kg/capita/year and increasing with fluctuations till 2003.

Portugal, just like Greece, shows a fluctuating, but steady increase of vegetable supply from 95 kg/capita/year in 1961 to 181 kg/capita/year in 2003. With the highest supply in 1998 (196 kg/capita/year).

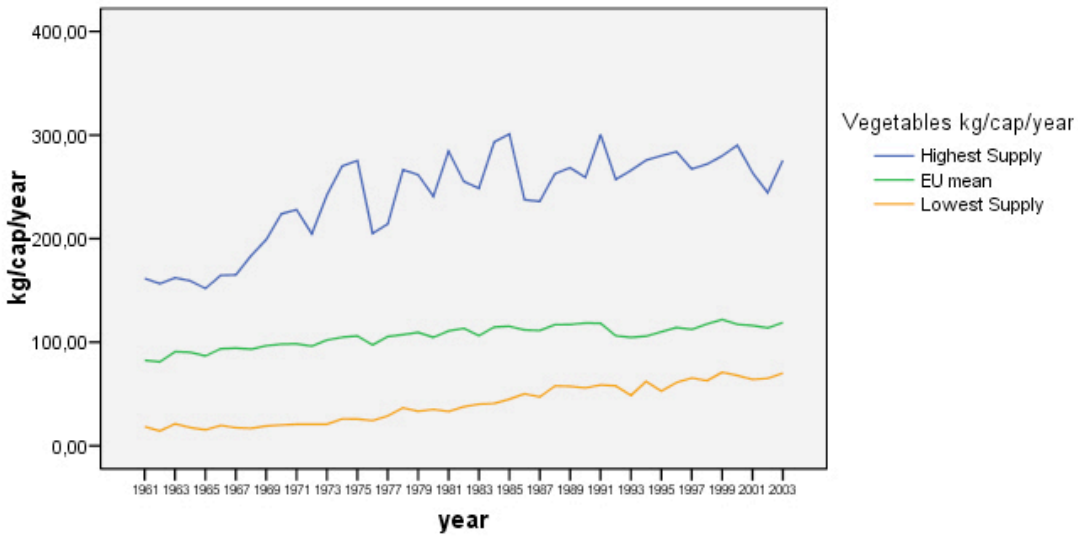
Romania`s vegetable supply is increasing steadily from 85 kg/capita/year in 1961 till 1984 to 200 kg/capita/year, then dropping to 104 kg/capita/year in 1992 and since then has been rising rapidly to 180 kg/capita/year in 2003.

The supply in *Italy* underwent similar fluctuations as in the other countries, but has in general been increasing from 131 kg/capita/year in 1961, to 178 kg/capita/year in 2003.
Cyprus shows a very similar picture with supplies rising from 84 kg/capita/year in 1961, to 169 kg/capita/year in 2003.

Slovakia shows the lowest supply with 70 kg/capita/year in 1993, rising to 101 kg/capita/year in 1999 and decreasing to 70 kg/capita/year again in 2003.
In *Slovenia* supply starts of with 59 kg/capita/year in 1992, increasing to around 90 kg/capita/year in the late 1990s and decreasing again to 73 kg/capita/year in 2003.

In *Finland* the supply in 1961 is very low with 19 kg/capita/year, increasing to 71 kg/capita/year in 2003.
The supply in the *Czech Republic* is fairly stable around 70 kg/capita/year, only increasing slightly to 82 kg/capita/year in 1999 and then decreasing again.

Figure 7: Average Supply of Vegetables in the EU



Source of raw data: FAO, 2008

The vegetable supply in *Austria* in the 1960s was between 60 and 70 kg/capita/year and staying rather stable till. In the last decade the supply increased to 90 kg/capita/year in 2003.

The increase of vegetable supply in *Belgium-Luxembourg* was stronger with 85 kg/capita/year in 1961 rising to 147 kg/capita/year in 1999. Belgium shows a high supply of vegetables with 130 kg/capita/year in 2003.
The supply in *Bulgaria* slowly increased, with fluctuations, from 105 kg/capita/year in 1961 to 145 kg/capita/year in 2003. The highest value could be observed in 1998 (164 kg/capita/year). Similarly in *Denmark* where supplies have been rising from 41 kg/capita/year in 1961, to 102 kg/capita/year in 2003. In *Estonia* supplies have been increasing in the last decade to 100 kg/capita/year in 2003.

France started with 151 kg/capita/year in 1961, fluctuating between 100 kg/capita/year and 150 since then to 143 kg/capita/year in 2003.
In *Germany* increase has been uncommonly stable from 50 kg/capita/year in 1961 to 91 kg/capita/year in 2003.
In *Hungary* the supply was found to be mainly between 90 kg/capita/year and 100 kg/capita/year, reaching a high 117 kg/capita/year in 2003.
The *Irish* supply has been increasing steadily from 40 kg/capita/year in 1961 to 82 kg/capita/year in 2003.
The supply in *Latvia* increased from 75 kg/capita/year in 1992 to 100 kg/capita/year in 2003. In *Lithuania*, supply increased from 66 kg/capita/year in 1992 to 102 kg/capita/year in 2003.
The supply in *Malta* has been fluctuating, increasing irregularly from 71 kg/capita/year in 1961 to 138 kg/capita/year in 2003, with the highest supply in 1996 (185 kg/capita/year).
In the *Netherlands* supply was between 70 kg/capita/year and 90 kg/capita/year, till 1999 to 2001 where supply could be found around 100 kg/capita/year and then decreased to 73 kg/capita/year in 2003.
Till 1978 the supply of vegetables in *Poland* could be found to be between 90 kg/capita/year to 100 kg/capita/year. Since 1979 the supply was always close to, but mostly over, 100 kg/capita/year, with the highest value in 1998 (137 kg/capita/year), reaching 100 kg/capita/year in 2003.
The supply in *Spain* was always rather high at 162 kg/capita/year in 1961, fluctuating between 140 kg/capita/year and 210 kg/capita/year through the years, reaching 143 kg/capita/year in 2003.

The vegetable supply in *Sweden* increased fairly steadily from 35 kg/capita/year in 1961 to 78 kg/capita/year in 2003.
In the *United Kingdom* vegetable supply rose from 60 kg/capita/year in 1961 to 92 kg/capita/year in 2003.

The Fruit Supply from 1961 to 2003

The average supply of fruit in the European Union in 1961 was 68 kg/capita/year, increasing by 49% to 101 kg/capita/year in 2003. Annex 5 shows a more detailed list of the fruit supply in 1961, 1993 and 2003 of the European Union.

The highest supply of fruit in the European Union can be found in *Cyprus* with the highest value in 1985 being 248 kg/capita/year. Cyprus already had a high supply in 1961 (121 kg/capita/year), reached it`s lowest value in 1963 (57 kg/capita/year) and then increased till 1970 to 235 kg/capita/year. After the highest supply in 1985 the supply dropped and since then has been around 100 kg/capita/year.

Other countries with a steady high supply are Greece and the Netherlands.
In 1961 the supply in *Greece* was 133 kg/capita/year and has since been ranging between 100 kg/capita/year and 180 kg/capita/year with values over 120 kg/capita/year since 1980, the last available value in 2003 being 147 kg/capita/year. 2002 it was higher with 164 kg/capita/year.
In the *Netherlands* the supply has been steadily rising from 63 kg/capita/year in 1961 to 182 kg/capita/year in 2003.

The clearly lowest value of fruit supply in the European Union can be found in *Poland*, where the supply has been fairly steadily rising from 18 kg/capita/year in 1961 to around 50 kg/capita/year in the last five years with the highest value in 2001 (57 kg/capita/year).

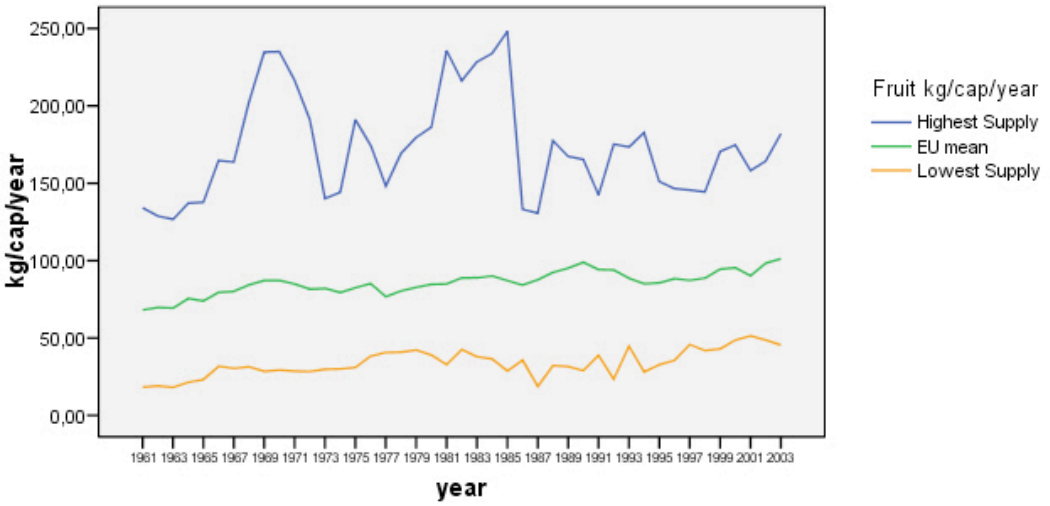
A low supply can also been detected in Estonia, Latvia, Lithuania and Romania. For Estonia, Latvia and Lithuania the available data is only from 1992 to 2003.
In *Estonia* the lowest value was in 1992 27 kg/capita/year. In the last five years the supply was between 70 kg/capita/year and 80 kg/capita/year.

Latvia started with 24 kg/capita/year in 1992 but increased the supply from 50 to 60 kg/capita/year in the last five years.

Lithuania`s supply is a little higher with 30 kg/capita/year in 1992 rising to 63 kg/capita/year in 2003.

In *Romania* the supply has - with drawbacks - been slowly increasing from 37 kg/capita/year in 1961, the lowest value of 21 kg/capita/year in 1964, to 65 kg/capita/year in 2003.

Figure 8: Average Supply of Fruit in the EU



Source of raw data: FAO, 2008

A low supply can also be found in *Belgium-Luxembourg* with 59 kg/capita/year in 1961 but has since been rising to 114 kg/capita/year in 1999. Since 2000 the values for Belgium are separately recorded and have been decreasing from 75 kg/capita/year in 2000 to 70 kg/capita/year in 2003.

The supply in *Hungary* has been very slowly increasing from 58 kg/capita/year in 1961 to 71 kg/capita/year in 2003.

The *Czech Republic* shows stable values between 60 and 80 kg/capita/year with increasing values (1993: 61 kg/capita/year, 2003: 80 kg/capita/year)

Finland started rather low with only 42 kg/capita/year in 1961 but has been steadily rising to 92 kg/capita/year in 2003.

A quite similar development can be observed in *France* with 54 kg/capita/year in 1961 rising to 96 kg/capita/year in 2003.

The supply in *Bulgaria* is clearly decreasing with a value of 80 kg/capita/year in 1961; then the numbers have been around 90 kg/capita/year and 100 kg/capita/year till 1976 then decreased again to around 70 kg/capita/year and 80 kg/capita/year till 1992 and even further declined to 46 kg/capita/year in 2003.

In *Austria* the supply 1961 was 134 kg/capita/year and then was fairly steady around 100 kg/capita/year, with the highest value in 1989 with 148 kg/capita/year, and the lowest in 1998 with 91 kg/capita/year. In 2003 the supply was 112 kg/capita/year.

The supply in *Ireland* has been steadily increasing from 40 kg/capita/year in 1961 to 138 kg/capita/year in 2003.

*Germany`*s fruit supply has been increasing from 90 kg/capita/year in 1961 to 113 kg/capita/year in 2003. The highest value in 1992 with a surprising 147 kg/capita/year clearly higher than the average.

Denmark has always been rather low supplied with numbers between 50 and 80 kg/capita/year. But in the last years supply has been rapidly increasing to 157 kg/capita/year in 2002 and 147 kg/capita/year in 2003.

Italy had an already high supply in 1961 of 95 kg/capita/year and has since been increasing to 131 kg/capita/year in 2003. The highest supply of fruit in Italy was in 1992 (147 kg/capita/year).

Malta increased as well from 53 kg/capita/year in 1961 to 105 kg/capita/year in 2003. With clear fluctuations even in the last decade between 62 kg/capita/year to 120 kg/capita/year.

In the first decade in *Portugal* values between 60 to 80 kg/capita/year were observed. Then the supply decreased to an all time low in 1978 (46 kg/capita/year) slowly increasing to numbers between 102 kg/capita/year to 131 kg/capita/year again. In 2003 the supply was 122 kg/capita/year.

Spain shows a clear increase of fruit supply from 52 kg/capita/year in 1961 to 113 kg/capita/year in 2003. The highest value in 2002 was 128 kg/capita/year.

Slovakia shows low figures in the 1990s (46 kg/capita/year in 1993), but increased quickly to 143 kg/capita/year in 2003 (highest value in 2000: 154 kg/capita/year).

In *Sweden* a steady increase of fruit supply can be observed from 61 kg/capita/year in 1961 to 115 kg/capita/year in 2003. Very similar to the *United Kingdom*,

where the supply increased from 64 kg/capita/year in 1961 to 116 kg/capita/year in 2003.

In summary the clearly highest supply of fruit in 2003 could be found in Netherlands (182 kg/capita/year). High supplies between 147 kg/capita/year to 130 kg/capita/year also had Greece, Denmark, Slovenia, Ireland, Austria and Italy.
The lowest supplies of fruit in 2003 were observed in Bulgaria (46 kg/capita/year), Poland (48 kg/capita/year), Latvia (54 kg/capita/year). Bulgaria is the only country with a decreasing supply of fruit in the European Union.

Discussion of Fruit and Vegetable Supply in the European Union

Fruit and vegetables play a vital role in a diversified and nutritious diet. Increasing urbanisation distances parts of the population from primary food production reducing the access of the urbane poor to a varied diet with enough fruits and vegetables. Within the timeframe of a week, twenty to thirty biologically specific types of food, with an emphasis on plant foods, are required for a healthy diet [WHO/FAO, 2002].
Most fruit and vegetables have a low energy density and are valuable sources for vitamins, minerals and other bioactive compounds [AICR, 2007].

The recommended intake of fruit and vegetables and an additional intake of whole grain foods provides about 20 to 25 g of non-starch polysaccharides (NSP) per day, allowing for potential health benefits. Recent studies have concluded, that a high intake of NSP promotes weight loss and thus reduces the risk of obesity and type 2 diabetes. A high fibre diet or a diet high in whole grain cereals also lowers the risk of coronary heart disease. Fruit and vegetable consumption in general show a significant protective effect for coronary heart disease and stroke through their variety of phytonutrients and potassium they contain. An increased fruit and vegetable consumption lowers the blood pressure. This effect is even more pronounced in combination with a low-fat diet [WHO/FAO, 2002].

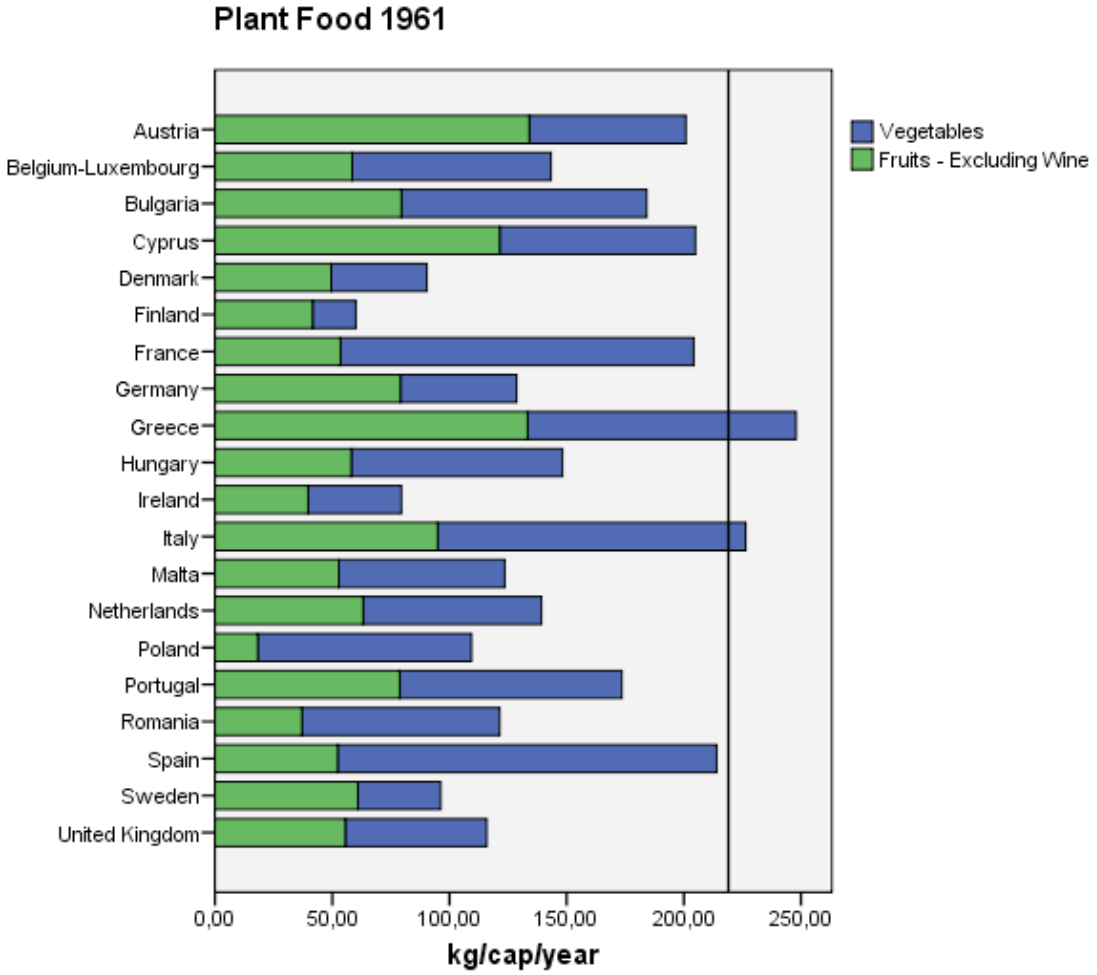
When viewing FBS-results it is important to note, as mentioned before, that supply does not equate with intake but is a certain percentage - depending on the food item in question - higher than the actual intake [SERRA-MAJEM et al., 2003].

The appointed public health goal by the American Institute of Cancer Research for plant foods, which comprise non starchy vegetables and fruit, is a consumption of at least 600 g per person per day (219 kg/capita/year). This recommendation is represented as a reference line in figures 9 and 10. The personal recommendation aimed to be considered for a healthy diet by individuals is 400 g of fruit and vegetables per person per day (146 kg/capita/year) [AICR, 2007].

In 1961 only Greece and Italy reached the public health goal, Spain was close. However, more than half of the countries meet the personal recommendation, though it is necessary to consider that the supply is always higher than the actual intake. Figure 9 also shows clear preference in some European countries for fruit, while in other countries vegetables are favoured.

Figure 9: Proportions of Vegetables and Fruit 1961

The recommendation line represents the public health goal of 600 g/ person/day (≙ 219 kg/capita/year)



Source of raw data: FAO, 2008

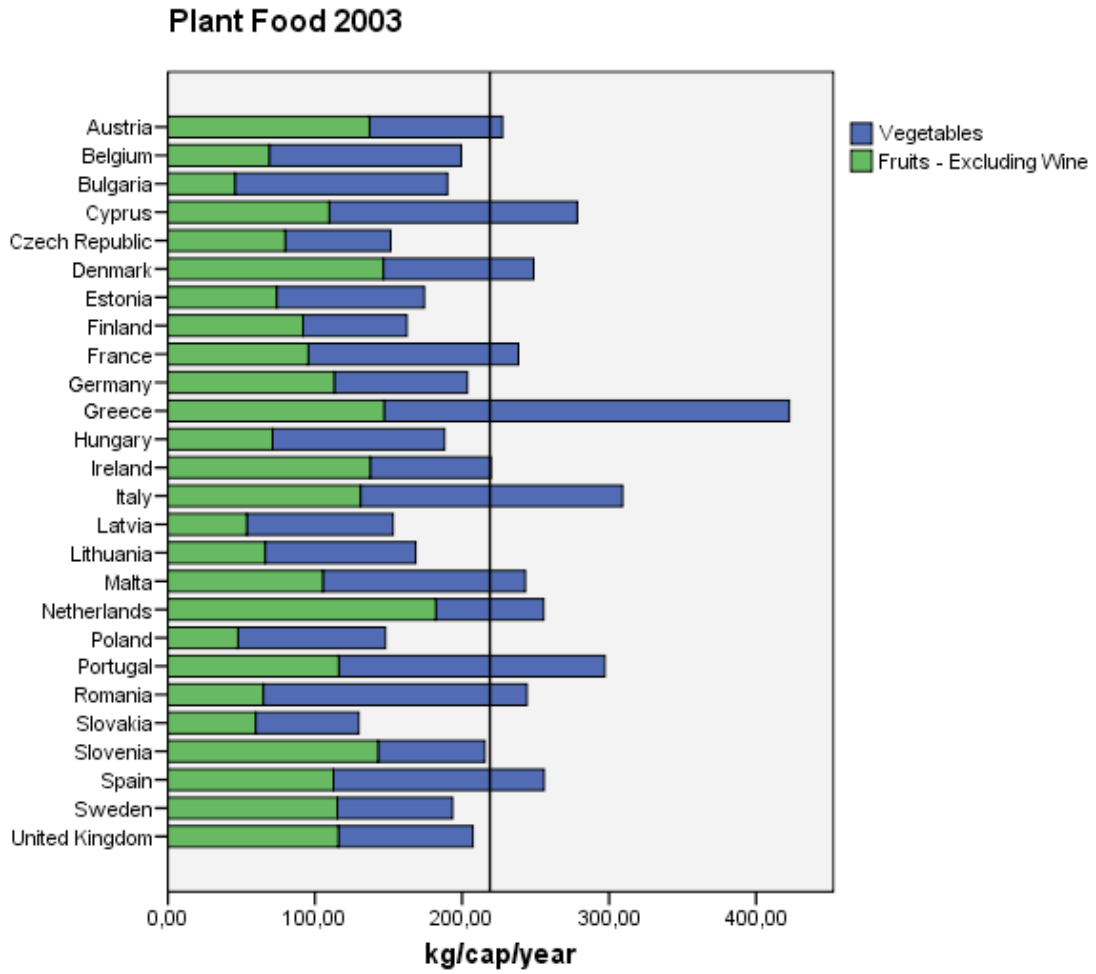
In 2003 thirteen of the twenty-seven European countries reached the recommended public health goal, Greece even far outranking the other countries. The Mediterranean countries stand out as being very well supplied with fruit and vegetables.

The only country in 2003 that does not achieve the personal recommendation is Slovakia.

Still the preferences in the countries for fruit or for vegetables differ considerably.

Figure 10: Proportions of Vegetables and Fruit 2003

The recommendation line represents the public health goal of 600 g/ person/day (≙ 219 kg/capita/year)



Source of raw data: FAO, 2008

Though FBS cannot describe differences between population groups in a country on their own, it is possible to combine the information from FBS with knowledge from other studies to estimate not only a plausible actual intake (see [SERRA-MAJEM et al., 2003] and [ERARD et al., 1986]) but also a probable distribution between population groups.

An example for a study that could be combined with FBS is the meta study by Irala-Estevez et al. [2000] on socio-economic differences of food habits concerning fruit and vegetables. Comparing 11 consumption surveys (food frequency questionnaire, dietary record, 24h recall) of food habits in 7 European countries from between 1985 to 1999, emphasising on the level of education

as well as occupation and differentiating between female and male adults, it was found that a higher socio-economic status improves the consumption of fruit and vegetables.
The difference in fruit intake between men of high socio-economic status and that of a low socio-economic level was 24.3 g/person/day. For women the estimated difference was 33.6 g/person/day for the fruit intake.
Similarly, the gap of vegetable intake between men of high socio-economic status and men of low education and occupation is 17 g/person/day, and for women the difference is 13.4 g/person/day.
Information like this can help to assess the nutrition situation in a country in combination with FBSs more accurately [IRALA-ESTEVEZ et al., 2000].

The Supply of Potatoes from 1961 to 2003

The average potato supply in the European Union in 1961 was recorded as 97 kg/capita/year, decreasing to 82 kg/capita/year in 2003 which reflects a decrease by 15%. Annex 7 lists the potato supply in the European Union from 1961, 1993 and 2003 in detailed numbers.

The highest potato supply in 2003 in the European Union could be observed in Latvia with 140 kg/capita/year available. High was the supply also in Poland (130 kg/capita/year) and Portugal (125 kg/capita/year). In the United Kingdom and Estonia a supply of 121 kg/capita/year was recorded, and in Ireland and Lithuania a supply of 120 kg/capita/year was observed.

The lowest supply of potatoes in 2003 in the European Union was found in Bulgaria with 34 kg/capita/year. Cyprus (38 kg/capita/year) and Italy (41 kg/capita/year) recorded a low supply as well.

The supply of potatoes in *Latvia* has been increasing from 116 kg/capita/year in 1992 to 140 kg/capita/year in 2003.
In *Poland* the supply of potatoes significantly declined from 222 kg/capita/year in 1961, which was the maximum supply of potatoes in the European Union throughout all observed years, to 130 kg/capita/year in 2003 and thus still being over average.

The supply of potatoes in *Portugal* increased from 88 kg/capita/year in 1961 to 109 kg/capita/year in 1969, then decreased again to 86 kg/capita/year in 1982 and since then overall trend has been an increase with 125 kg/capita/year in 2003.

In the *United Kingdom* an overall increase of potato supply could be observed from 99 kg/capita/year in 1961 to 121 kg/capita/year in 2003.

In *Estonia* the potato supply is above average with 106 kg/capita/year in 1961 and 121 kg/capita/year in 2003. The highest supply in 1996 (151 kg/capita/year) and the lowest in 1998 (92 kg/capita/year).

The supply in *Ireland* has been slowly decreasing over the years from 139 kg/capita/year in 1961 to 120 kg/capita/year in 2003.

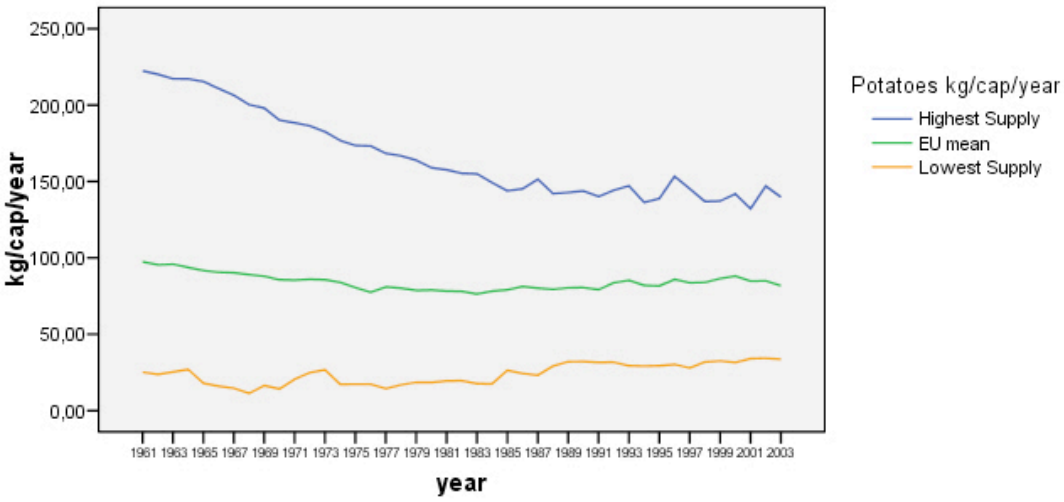
In *Lithuania*, the potato supply increased from 1992 (128 kg/capita/year) to 1998 (137 kg/capita/year) and then declined again to 120 kg/capita/year in 2003.

The supply of potatoes in *Bulgaria* was fairly stable, increasing from 25 kg/capita/year in 1961 to 34 kg/capita/year in 2003.

In 1961 to 1973 the potato supply in *Cyprus* was stable around 45 kg/capita/year to 55 kg/capita/year. In 1974 the supply rapidly drops to 17 kg/capita/year, reaching the lowest values of supply in 177 with 14 kg/capita/year only. Slowly increasing again, till reaching 45 kg/capita/year in 1990 again, staying rather stable between 30 kg/capita/year to 45 kg/capita/year.

The potato supply in *Italy* has slightly decreased from 54 kg/capita/year in 1961 to 41 kg/capita/year in 2003. The decline had already occurred in the 1960s and since 1970 the supply was never higher than 45 kg/capita/year.

Figure 11: Average Supply of Potatoes in the EU



Source of raw data: FAO, 2008

In *Austria* an almost stable decrease in potato supply could be observed. In 1961 were 85 kg/capita/year available, in 2003 only 60 kg/capita/year were available.

The potato supply in *Belgium-Luxembourg* was by far higher and almost stable, if a little decreasing, at around 100 kg/capita/year (1961: 133 kg/capita/year, 1999: 111 kg/capita/year).

From 1993 to 2002 the potato supply in the *Czech Republic* was around 80 kg/capita/year; dropping to 69 kg/capita/year in 2003.

In 1961 the potato supply in *Denmark* was at 122 kg/capita/year, then showing a clear decline to 77 kg/capita/year in 2003. Similar, the supply in *Finland* has been decreasing from 115 kg/capita/year in 1961 to 72 kg/capita/year in 2003. A similar pattern can be observed in *France* (from 115 kg/capita/year in 1961 to 65 kg/capita/year in 2003) and *Germany* (from 139 kg/capita/year in 1961 to 72 kg/capita/year in 2003). In *Hungary* the potato supply dropped less greatly from 95 kg/capita/year in 1961 to 69 kg/capita/year in 2003 and in the *Netherlands* from 98 kg/capita/year (1961) to 86 kg/capita/year (2003). The high supply of potatoes in *Spain* in 1961 of 125 kg/capita/year dropped significantly to 79 kg/capita/year in 2003.

In *Slovakia* the potato supply decreased from an above average 126 kg/capita/year in 1993 to 72 kg/capita/year in 2003. In Sweden the same development

could be observed, with a decline from 100 kg/capita/year in 1961 to 54 kg/capita/year in 2003.

Contrary to most countries, did the potato supply in *Greece* not decline but increase from 32 kg/capita/year in 1961 to 65 kg/capita/year in 2003. Also in *Malta* the supply increased from 45 kg/capita/year in 1961 to 68 kg/capita/year in 2003. In *Romania* a slight increase can be observed as well, from 69 kg/capita/year in 1961 to 96 kg/capita/year 2003, similar to Slovakia where an increase from 47 kg/capita/year in 1992 to 51 kg/capita/year in 2003 can be observed. In the United Kingdom a clear increase was observed from 99 kg/capita/year in 1961 to 121 kg/capita/year in 2003.

Discussion of Potato Supply in the European Union

Starchy plant foods are a staple source of dietary energy and bulk; they strongly influence the proportion of carbohydrate energy of total energy supply. However, the evidence indicating effects on the risk of any cancer remains insubstantial and thus no recommendations are expressed. The consumption of refined starchy foods should be limited [AICR, 2007].

Potatoes are a considerable source for various micronutrients and vitamins. High rates of potassium, phosphor, magnesium and ascorbic acid make potatoes a favourable food item. The manner of preparation is crucial to the preservation of ascorbic acid [Elmadfa et al., 1997].

4.2.2. Supply of Pulses and Cereals

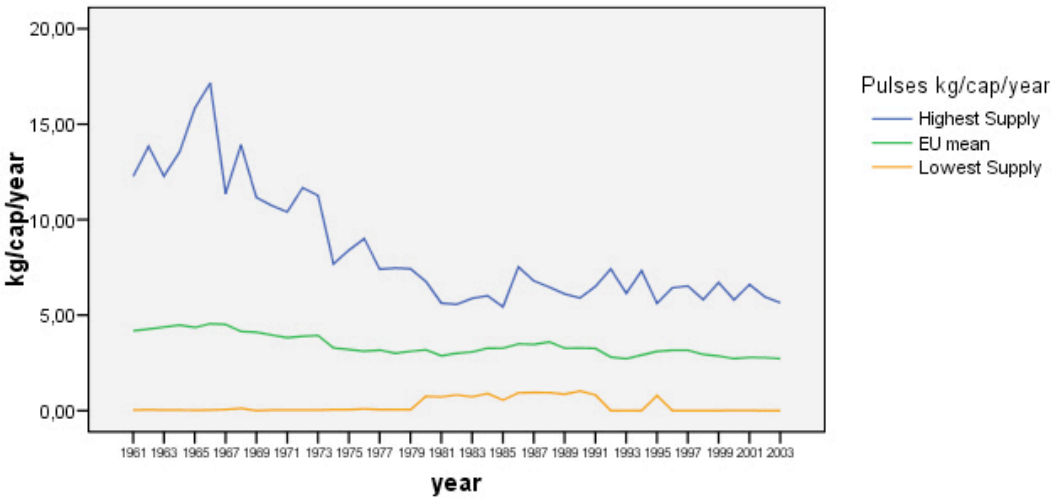
The Supply of Pulses from 1961 to 2003

The average supply of pulses in 1961 in the European Union was 4 kg/capita/year, decreasing by 25% to an average of 3 kg/capita/year in 2003. In Annex 8 a detailed list of the pulses supply from 1961, 1993 and 2003 in the European Union is available.

In 2003 the highest supply of pulses was recorded in Spain with 5.65 kg/capita/year, closely followed by Italy with 5.59 kg/capita/year. Greece (4.81 kg/capita/year) and Lithuania (4.79 kg/capita/year) show a high supply of pulses as well. The lowest supply was recorded in Latvia with no noticeable supply at all. Germany (0.72 kg/capita/year), Austria (0.74 kg/capita/year) and Estonia (0.94 kg/capita/year) show a supply below 1 kg/capita/year.

In Malta the supply of pulses was 12 kg/capita/year in 1961, increased to 17 kg/capita/year in 1966 and then declined to 4 kg/capita/year in 2003. In Cyprus a decrease from 10 kg/capita/year in 1961 to 4 kg/capita/year in 2003 could be detected.

Figure 12: Average Supply of Pulses in the EU



Source of raw data: FAO, 2008

The Cereal Supply from 1961 to 2003

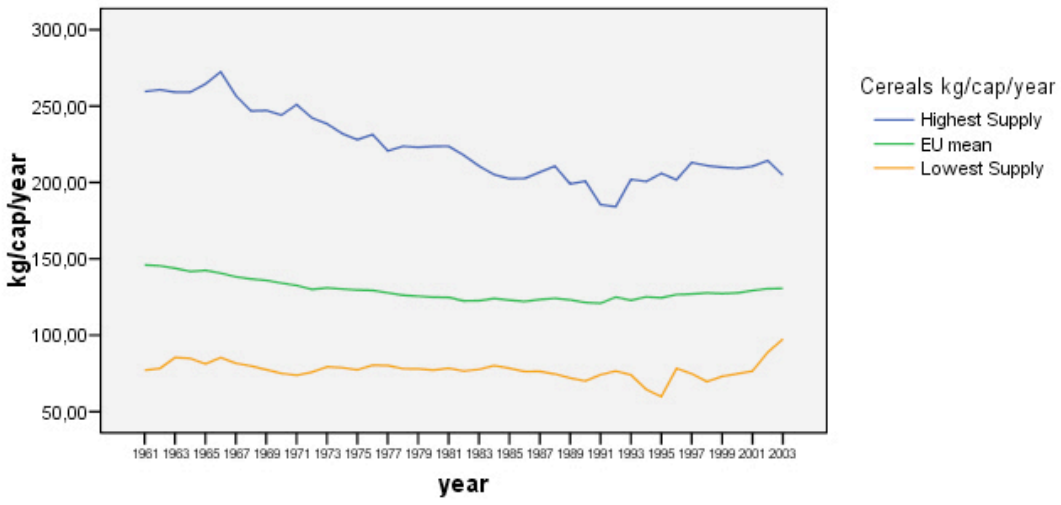
In 1961 the cereal supply in the European Union showed an average of 146 kg/capita/year. In 2003 this average supply of cereal decreased by 10% to 131 kg/capita/year. The cereal supply from 1961, 1993 and 2003 in the European Union can be viewed in more detail in Annex 9.

The highest supply of cereal in 2003 in the European Union could be detected in Romania with 205 kg/capita/year. The next in line are Malta with 181 kg/capita/year, and Italy with 163 kg/capita/year.
The lowest supply was found in Cyprus and Spain with only 98 kg/capita/year.

In 1961 the highest supplies were much higher with Bulgaria showing a value of 260 kg/capita/year, Romania (218 kg/capita/year) and Poland (201 kg/capita/year).

In most countries the cereal supply stays rather stable or decreases slightly, but in Denmark an increase from 100 kg/capita/year in 1961 to 138 kg/capita/year in 2003 can be observed. Similar in Malta (from 166 kg/capita/year in 1961 to 180 kg/capita/year in 2003), Portugal (1961: 123 kg/capita/year; 2003: 133 kg/capita/year), Slovenia (1993: 107 kg/capita/year; 2003: 124 kg/capita/year) and Sweden (1961: 77 kg/capita/year; 2003: 104 kg/capita/year) a small increase was detected.

Figure 13: Average Supply of Cereals in the EU



Source of raw data: FAO, 2008

Discussion of the Supply of Pulses and Cereals in the European Union

Besides fruit and vegetables, cereals and pulses are a preferred source for non-starch polysaccharides (NSP). With the recommended intake of fruit and

vegetables and the consumption of whole grain foods, an amount of more than 20g of NSP can be achieved. Food rich in NSP usually has a low glycaemic index and reduces the risk of developing type 2 diabetes [WHO/FAO, 2002].

Cereals are a staple food and in whole form also contain essential fats and protein, besides starch. The dietary fibre contained in cereals and pulses probably protects against colorectal cancer but evidence is limited and no recommendations are expressed. Nevertheless, food high in dietary fibre may have an indirect protective effect on cancer because of their low energy density and thus reducing unhealthy weight gain. Pulses are an important source of plant protein [AICR, 2007].

Figures of the proportion of cereals and pulses for 1961 and 2003, for all available countries can be viewed in Annex 10 and 11.

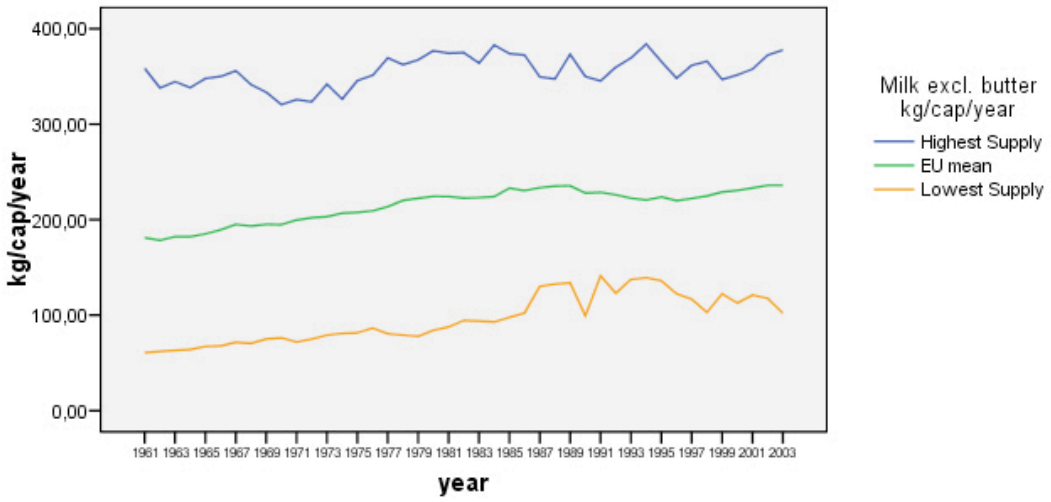
4.2.3. Milk Supply

In 1961 the average supply of milk in the European Union was 178 kg/capita/year increasing by 33% to 236 kg/capita/year in 2003. Annex 12 shows the milk supply from 1961, 1993 and 2003 in the European Union in numbers.

The highest supply of milk in 2003 was found in Sweden (378 kg/capita/year) and Finland (356 kg/capita/year). The lowest supply in 2003 was detected in Slovakia with 102 kg/capita/year.

Independent of the starting value in 1961 almost all countries of the European Union have an increasing supply of milk. Exceptions are only Estonia with an decreasing milk supply from 358 kg/capita/year in 1992 to 211 kg/capita/year in 2003, furthermore Poland (1961: 207 kg/capita/year, 2003: 173 kg/capita/year) and Slovakia (1993: 166 kg/capita/year, 2003: 102 kg/capita/year).

Figure 14: Average Supply of Milk excl. Butter in the EU



Source of raw data: FAO, 2008

Discussion of Milk Supply in the European Union

The consumption of dairy products containing calcium is an important factor in the prevention of osteoporosis. The daily calcium intake to effectively prevent osteoporosis should be at 400 to 500 mg. The so called calcium paradox[1] needs to be further investigated to allow a substantial recommendation [WHO/ FAO, 2002].

4.2.4. Egg Supply

The egg supply in the European Union in 1961 recorded an average value of 10 kg/capita/year, increasing by 20% to an average 12 kg/capita/year in 2003. Annex 13 presents the egg supply from 1961, 1993 and 2003 in detail.

The highest values in 2003 for the egg supply in the European Union were observed in Denmark (18 kg/capita/year), Hungary (17 kg/capita/year), Netherlands (16 kg/capita/year) and France (15 kg/capita/year). The lowest supplies were found in Ireland and Slovenia with 7 kg/capita/year, Finland (8 kg/ capita/year), Greece (9 kg/capita/year), Portugal (10 kg/capita/year).

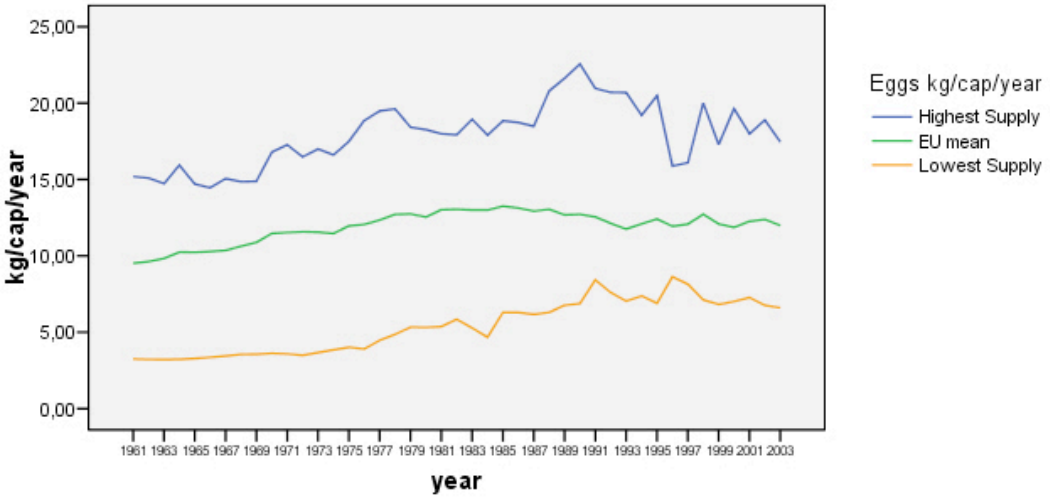
[1] Hip fracture rates are higher in developed countries with a high calcium intake, than in developing countries with lower calcium intake numbers.

In 1961 the differences between the values were much higher with 15 kg/capita/year in Belgium-Luxembourg and the United Kingdom being the highest values and 3 kg/capita/year in Portugal being the lowest value.

A general harmonisation can thus be observed.

The highest supply throughout the years could be observed in Hungary with a growing supply from 1961 (9 kg/capita/year) to 1990 (23 kg/capita/year, maximum supply of eggs in the European Union in all years) and then decreasing to 17 kg/capita/year till 2003.

Figure 15: Average Supply of Eggs in the EU



Source of raw data: FAO, 2008

Discussion of Egg Supply in the European Union

Egg yolk is particularly rich in cholesterol, indicating an influence on CVDs, but does not provide saturated fatty acids. If the intake of dairy fat and meat are controlled, it is not necessary to severely restrict egg yolk intake [WHO/FAO, 2002]. The evidence on cancer also is not substantial enough to justify a recommendation to avoid eggs [AICR, 2007].

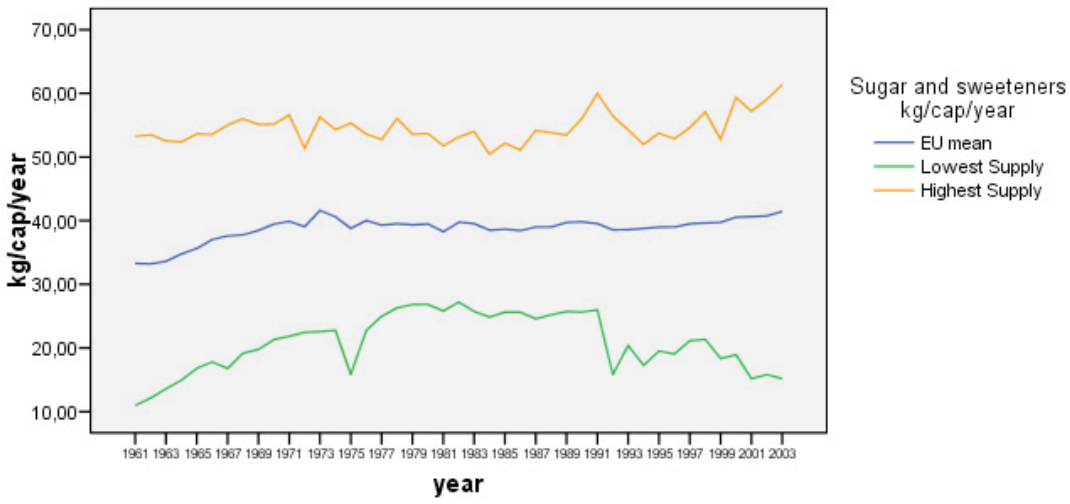
4.2.5. Supply of Sugar and Sweeteners

The average supply of sugar and sweeteners in the European Union increased from 33 kg/capita/year in 1961 to 41 kg/capita/year in 2003, reflecting an 24% increase. More detailed figures for the sugar and sweeteners supply can be viewed in Annex 14.

The highest supply of sugar and sweeteners in 2003 in the European Union could be observed in Estonia (61 kg/capita/year), Denmark (58 kg/capita/year) and Belgium (55 kg/capita/year). The lowest supply was found in Slovenia (15 kg/capita/year) followed by Romania (27 kg/capita/year) and Bulgaria (30 kg/capita/year).

After a beginning harmonisation in the 1970s/1980s the values started to drift further apart in the beginning of the 1990s. But the countries accountable for that changed. In 1961 the highest supplies of sugar and sweeteners could be found in Ireland and the United Kingdom (both 53 kg/capita/year) and the lowest supply in Romania (11 kg/capita/year), which still has a low supply, and Greece (15 kg/capita/year).

Figure 16: Average Supply of Sugar and Sweeteners in the EU



Source of raw data: FAO, 2008

Discussion of the Supply of Sugar and Sweeteners in the the European Union

High intakes of free sugars provide energy without specific nutrients. To reduce the risk of unhealthy weight gain a restriction of free sugars is recommended, though a population goal of 10% is controversial. A distinction between free sugars in food and free sugars in drinks is necessary [WHO/FAO, 2002]. Drinks with a high sugar content reduce appetite control and probably promote weight gain by promoting excess energy intake [AICR, 2007]. An energy dense diet promotes obesity and diabetes. Dietary sugars also play a role in the aetiology of dental caries. There is a significant correlation between sugar supplies and dental caries, though the frequency, amount and type of sugar consumption makes a decided difference. Especially the consumption of sugar containing drinks is associated with an increased risk of dental caries. In countries with a consumption of free sugars below 15 to 20 kg/capita/year levels of dental caries are low [WHO/FAO, 2002]. This suggests that a reduction of supply of sugars in the European Union would be desirable.

4.2.6. Supply of Oilcrops, Vegetable Oils, Animal Fats

The Supply of Oilcrops from 1961 to 2003

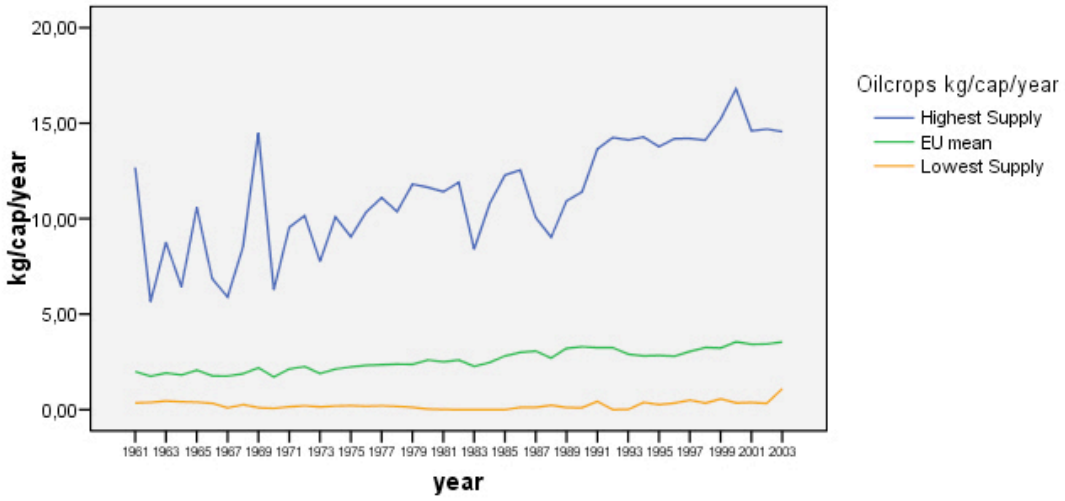
In the European Union the average supply of oilcrops in 1961 is recorded at 2 kg/capita/year, increasing by 75% to 3.5 in 2003. Details on the supply of oilcrops in 1961, 1993 and 2003 in the European Union can be found in Annex 15.

The supply of oilcrops differs notably, with the highest supply in 2003 in Greece (15 kg/capita/year) and Cyprus with 9 kg/capita/year. The lowest supply of oilcrops was observed in Estonia (1 kg/capita/year). The average oil crops supply shows a steady increasing trend with Greece showing far higher values than the average.

In 1961 Cyprus (13 kg/capita/year) had a higher supply of oilcrops than Greece (6 kg/capita/year). The lowest supplies were under 1 kg/capita/year in Finland, Bulgaria, Poland, Austria, Romania, Hungary, Belgium-Luxembourg, Ireland and

Spain. All other countries had values between 1 kg/capita/year and 3 kg/capita/year.

Figure 17: Average Supply of Oilcrops in the EU



Source of raw data: FAO, 2008

The Supply of Vegetable Oils from 1961 to 2003

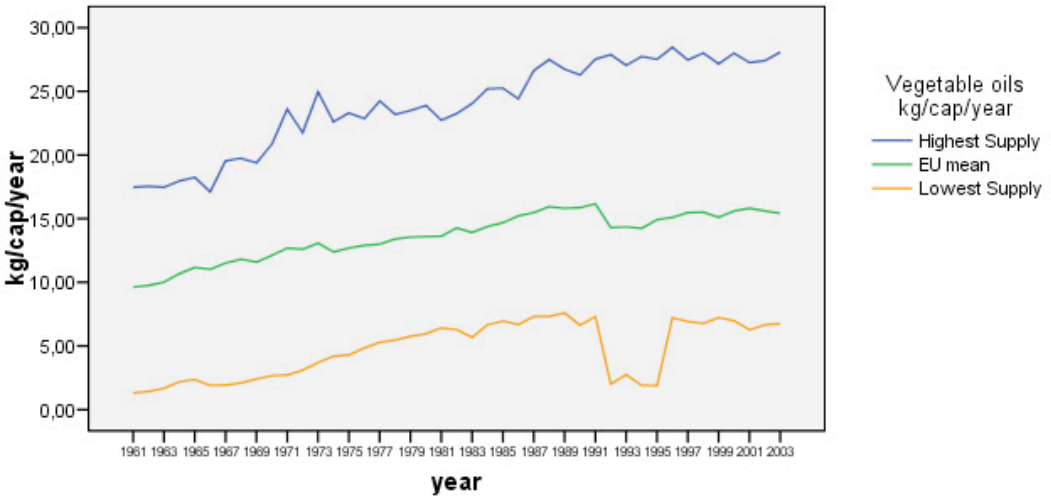
In 1961 in the European Union 10 kg/capita/year of vegetable oils were available, increasing by 50% to 15 kg/capita/year. Annex 16 presents a more detailed list of the supply of vegetable oils in 1961, 1993 and 2003 in the European Union.

The highest supply in 2003 in the European Union of vegetable oils was recorded in Spain (28 kg/capita/year), followed by Italy (27 kg/capita/year) and Greece (25 kg/capita/year). The lowest supply was noticed in Denmark and Estonia (8 kg/capita/year), Slovenia (9 kg/capita/year) and Finland (11 kg/capita/year).

In 1992 a sudden drop in supply could be observed in Estonia, Latvia and Lithuania with values between 2 kg/capita/year and 2.5 kg/capita/year. Lithuania stayed low at 2 kg/capita/year till 1995 and increased then to 8 kg/capita/year in 1996.

In 1961 values were clearly lower than 2003 with the highest value in Greece (18 kg/capita/year), Netherlands (17 kg/capita/year), Cyprus (14 kg/capita/year) and the lowest values in Hungary (1 kg/capita/year), Finland, Poland and Ireland (all at 3 kg/capita/year).

Figure 18: Average Supply of Vegetable Oils in the EU



Source of raw data: FAO, 2008

Olive oil is a major source of vegetable oil, especially in the Mediterranean region. In Greece, the country with the highest supply of olive oils throughout the years, the supply of olive oil in 1961 was 15 kg/capita/year compared to a total vegetable oil supply of 18 kg/capita/year. In 2003 the olive oil supply in Greece still presented a great part (64%) of the total vegetable oil supply (25 kg/capita/year) in this country with 16 kg/capita/year.

Other countries with a high supply of olive oil in 2003 in the European Union were Italy (13 kg/capita/year) and Spain (12 kg/capita/year). Portugal (5 kg/capita/year), Cyprus (3 kg/capita/year), France (2 kg/capita/year) and Belgium (1 kg/capita/year) are the only other countries who have an olive oil supply over or at 1 kg/capita/year.

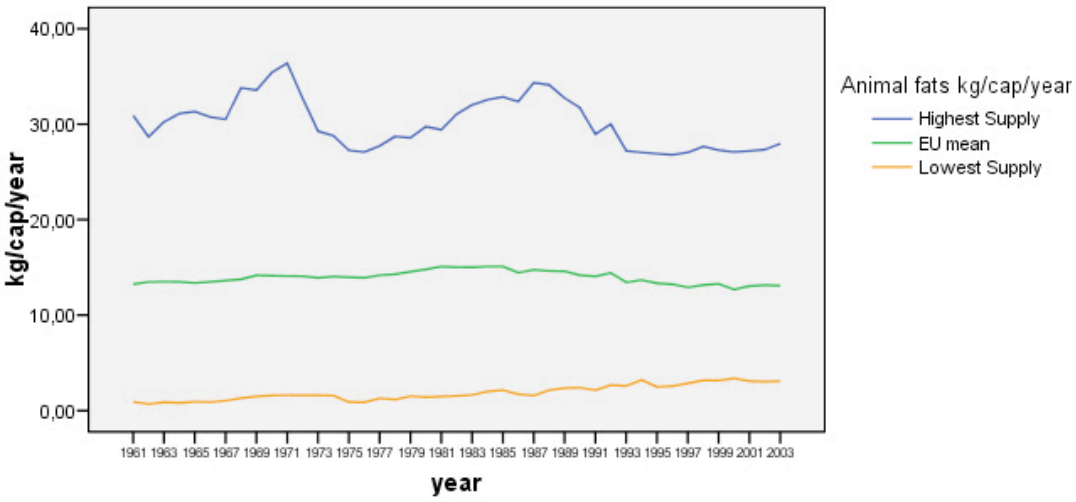
The Supply of Animal Fats from 1961 to 2003

The average supply of animal fats in the European Union stayed stable at 13 kg/capita/year between 1961 and 2003. Annex 17 shows particulars to the animal fat supply in the European Union for 1961, 1993, 2003.
In 2003 the highest supply of animal fats in the European Union was recorded in Hungary (28 kg/capita/year), Denmark and Belgium (both 26 kg/capita/year). Followed by Germany (22 kg/capita/year) and Sweden (19 kg/capita/year).
The lowest supplies of animal fats were found in Cyprus (3 kg/capita/year), Greece, Bulgaria and Romania (all 4 kg/capita/year).

In 1961 the highest supplies were in Denmark (31 kg/capita/year), Hungary (23 kg/capita/year), Finland and Austria (22 kg/capita/year). The lowest supplies could be found in Cyprus (1 kg/capita/year), Spain and Greece (2 kg/capita/year).

In the last four decades the highest supplies were always noticed in Denmark and Hungary. The supply in Denmark decreased slightly from 31 kg/capita/year in 1961 to 26 kg/capita/year in 2003. While in Hungary supply increased slightly since 1961 (23 kg/capita/year) to 2003 at 28 kg/capita/year, but the highest value could be observed in 1987 (34 kg/capita/year) so in the last years the supply has been on a decline.

Figure 19: Average Supply of Animal Fats in the EU



Source of raw data: FAO, 2008

Discussion of the Supply of Animal Fats and Vegetable Oils in the European Union

Dietary lipids are the most energy dense constituents in diets. Their contribution to total energy intake increases with industrialisation and urbanisation. Meat fat, fat from milk and dairy products are a major source for fat in high income countries [AICR, 2007].

A diet rich in high saturated fat is associated with a higher risk of impaired glucose tolerance, and thus type 2 diabetes. When the total fat intake is more than 37% of total energy, altering the fat quality has little effect. In general, an energy rich diet promotes weight gain and consequently obesity and associated diseases [WHO/FAO, 2002].

The evidence on animal fats causing colorectal cancer is limited but the energy density and the subsequent possible overweight and obesity implicate the necessity to limit the consumption of animal fats, mainly because of the CVD risk [AICR, 2007].

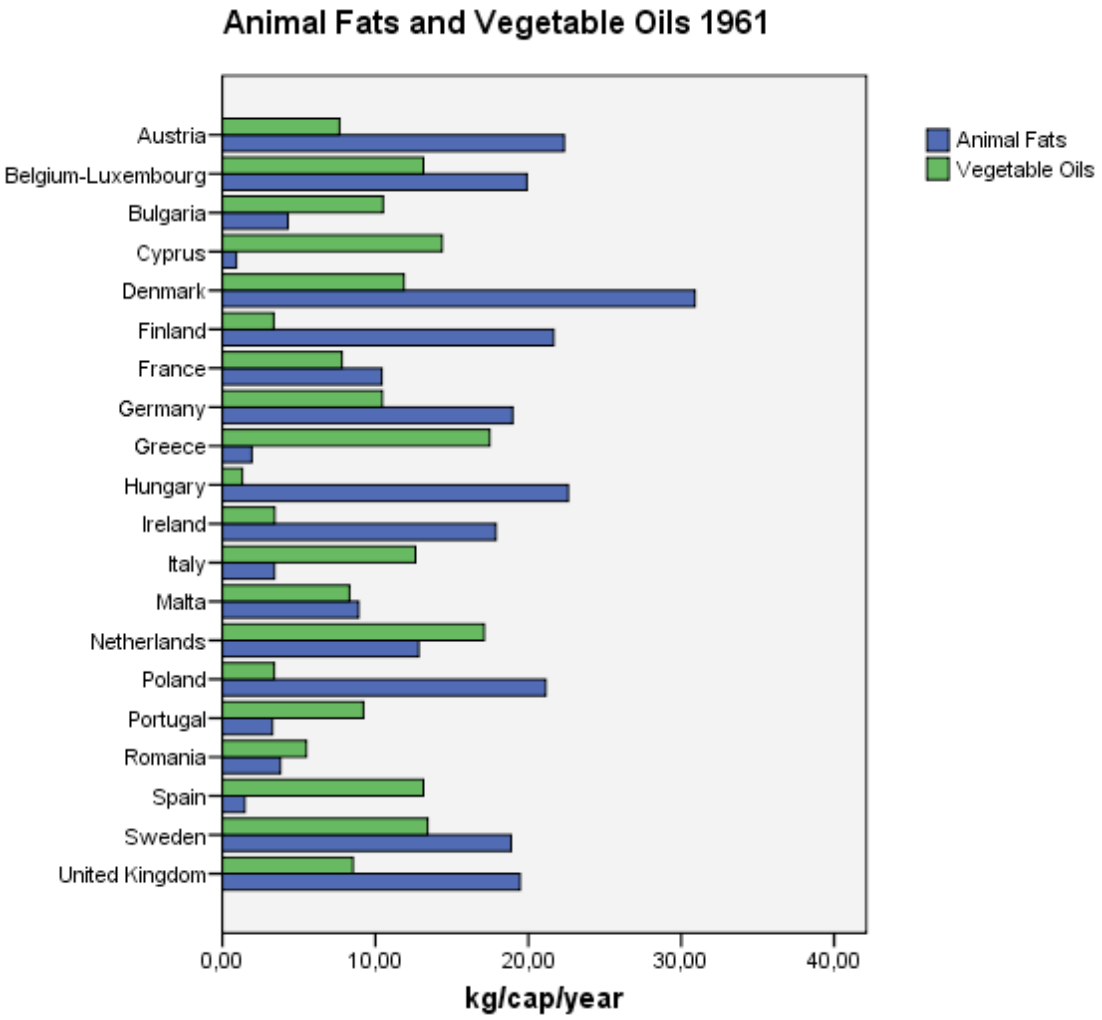
The relationship between dietary fats and cardiovascular diseases (CVD) has been extensively investigated. Fat intake has a strong influence on CVDs,

through effects on blood lipids, thrombosis, blood pressure, arterial function, arrythmogenesis and inflammation. The qualitative composition of fats plays a significant role in modifying this risk. Saturated fatty acids elevate blood cholesterol and should be replaced with polyunsaturated fatty acids. The intake of saturated fatty acids should be restricted to less than 10% of daily energy intake, less than 7% for high risk groups [WHO/FAO, 2002]. Cholesterol is only found in foods of animal origin, though the proportion and types of saturated and unsaturated fatty acids are more important influences on cholesterol metabolism than the amount of dietary cholesterol [AICR, 2007]. Also the intake of trans fatty acids, mostly found in industrially hardened oils, should be reduced. The intake should be less than 1% of the daily energy intake [WHO/FAO, 2002].

Fats and oils are eaten as natural part of various foods, are contained in manufactured foods, used for cooking and preparing the food [AICR, 2007].
The types of consumed oils also change with the increased use of hardened margarines, of which some do not need to be refrigerated. Potential developments in the oil and fat sector could effect all stages of the oil production, including a possible increase in the blending of oils aimed at producing oils with improved fatty acid composition [WHO/FAO, 2002]

Figure twenty shows the proportions of animal fats and vegetable oils in 1961. A clear preference of some countries for animal fats or vegetable oils is visible. While in most countries the supply of animal fats is higher than the supply of vegetable oils, mostly Mediterranean countries show a distinct prevalence of vegetable oils. Besides Cyprus, Greece, Italy, Portugal and Spain also Bulgaria, Romania and the Netherlands display a higher vegetable supply than supply of animal fats.

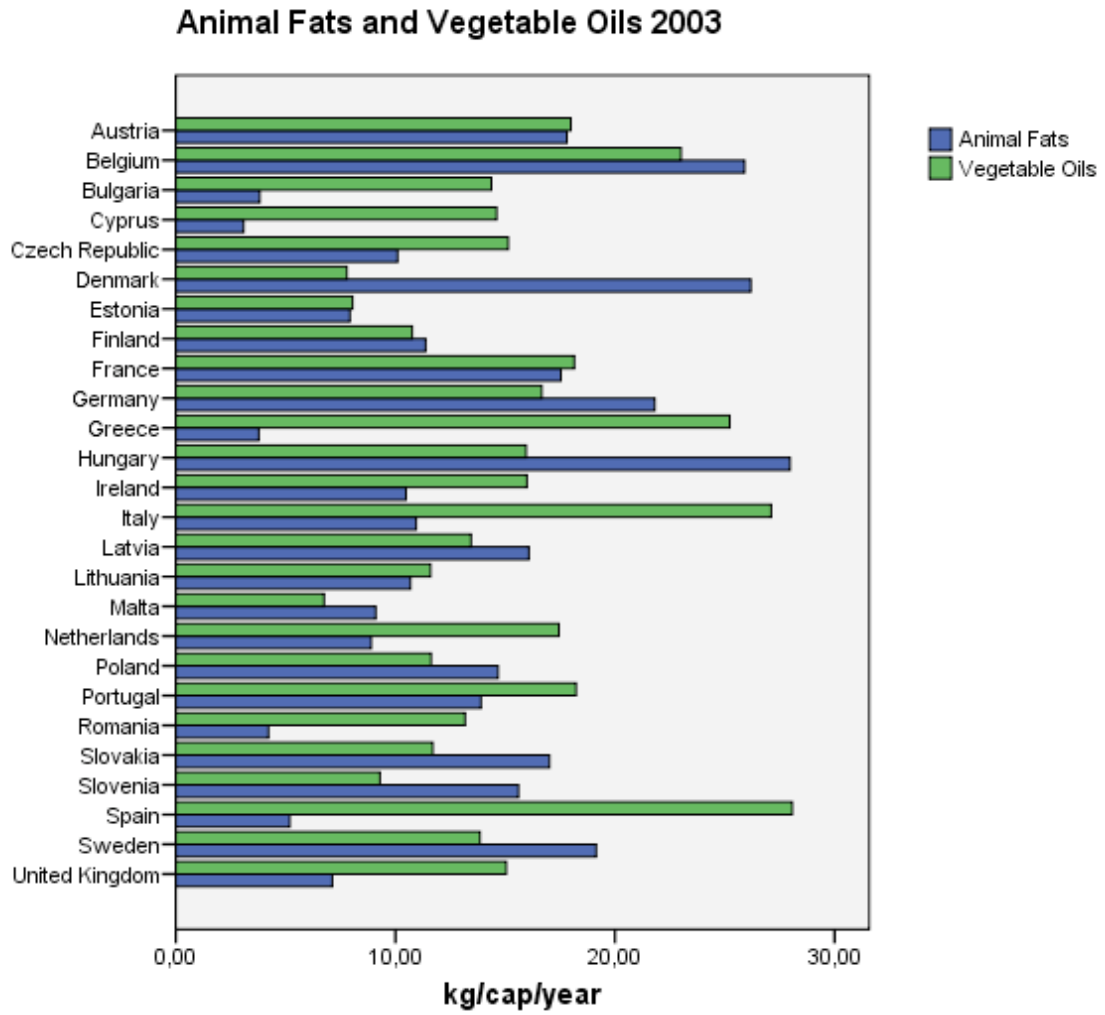
Figure 20: Proportions of Animal Fats and Vegetable Oils 1961



Source of raw data: FAO, 2008

In 2003 the mentioned countries still have a higher supply of vegetable oil than animal fats and some countries followed this ideal and increased their supply of vegetable oils. In 2003 the United Kingdom and Ireland have a clearly higher vegetable oil supply than animal fat supply; in France and Austria the vegetable oil supply 2003 is a little higher than for animal fats. Some of the other countries, where data for 1961 was not available, also recorded a higher supply of oils: the Czech Republic, Estonia and Lithuania. As mentioned before, while the vegetable supply increased in recent years, the animal fat supply mostly stayed the same. Thus this trend is easily reconstructed.

Figure 21: Proportions of Animal Fats and Vegetable Oils 2003



Source of raw data: FAO, 2008

While the shift to a higher proportion of vegetable oils is a favourable trend, the general increase of lipid supply is not. Action should be taken to ensure that the populations diet is not too energy rich. The proportion of fat compared to total energy intake increased from 30% in 1961 to 34% in 2003. A WHO/FAO expert consultation determined the international goal of fat intake between 15% - 30% [WHO/FAO, 2002]. Thus the fat supply of 2003 exceeds the recommendation.

4.2.7. Supply of Red Meat and Poultry Meat

The Supply of Bovine Meat from 1961 to 2003

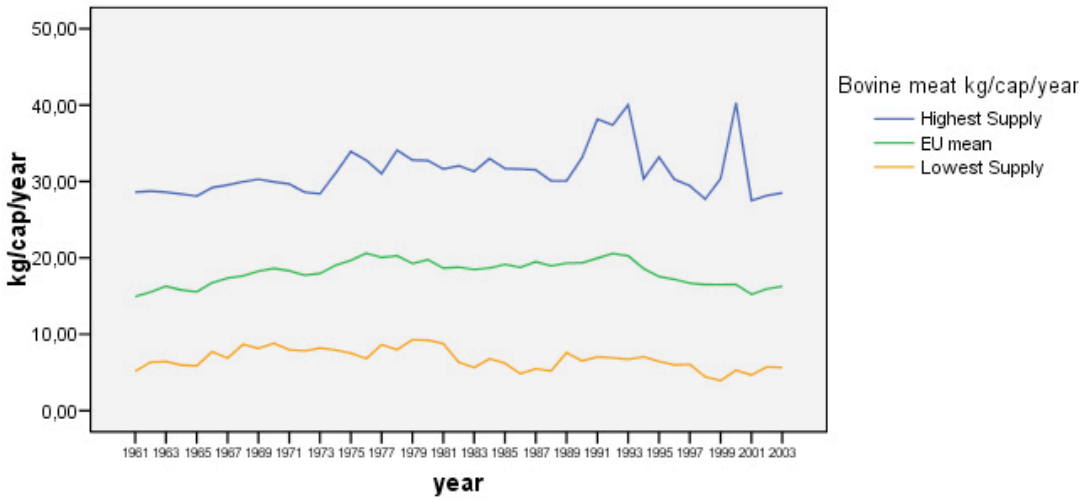
The average supply of bovine meat in 1961 in the European Union was 15 kg/capita/year and increased only slightly by 7% to 16 kg/capita/year in 2003. Specifics of the bovine meat supply in the European Union in 1961, 1993 and 2003 in numbers can be found in Annex 18.

The highest supply of bovine meat in 2003 could be observed in Denmark with 29 kg/capita/year, followed by France (27 kg/capita/year), Italy (25 kg/capita/year), Slovenia, Sweden and Ireland (24 kg/capita/year). Over average were also Malta (22 kg/capita/year), the United Kingdom and the Netherlands (21 kg/capita/year), Greece, Belgium, Austria (19 kg/capita/year), Finland and Portugal (18 kg/capita/year). The lowest supply could be found in Hungary (6 kg/capita/year), Poland and Cyprus (7 kg/capita/year).

In 1961 the highest supply of bovine meet was at 29 kg/capita/year in France, followed by the United Kingdom (25 kg/capita/year) and Belgium-Luxembourg (24 kg/capita/year). The lowest supply was observed in Greece with 5 kg/capita/year, Spain and Portugal (6 kg/capita/year) and Bulgaria (7 kg/capita/year).

In the figure some clear peaks are visible in the highest supplies of bovine meat.
In Greece a sudden increase was recorded at 40 kg/capita/year of bovine meat supply in 2000. In 1993 Lithuania had a meat supply of 40 kg/capita/year. 1992 it was a little lower (37 kg/capita/year). And 1991 Malta had a supply of 38 kg/capita/year bovine meat.

Figure 22: Average Supply of Bovine Meat in the EU



Source of raw data: FAO, 2008

The Supply of Pork Meat from 1961 to 2003

The average supply of pig meat in 1961 in the European Union was 21 kg/ capita/year and increased strongly by 95% to 41 kg/capita/year in 2003. Annex 19 shows the pork supply in more detail.

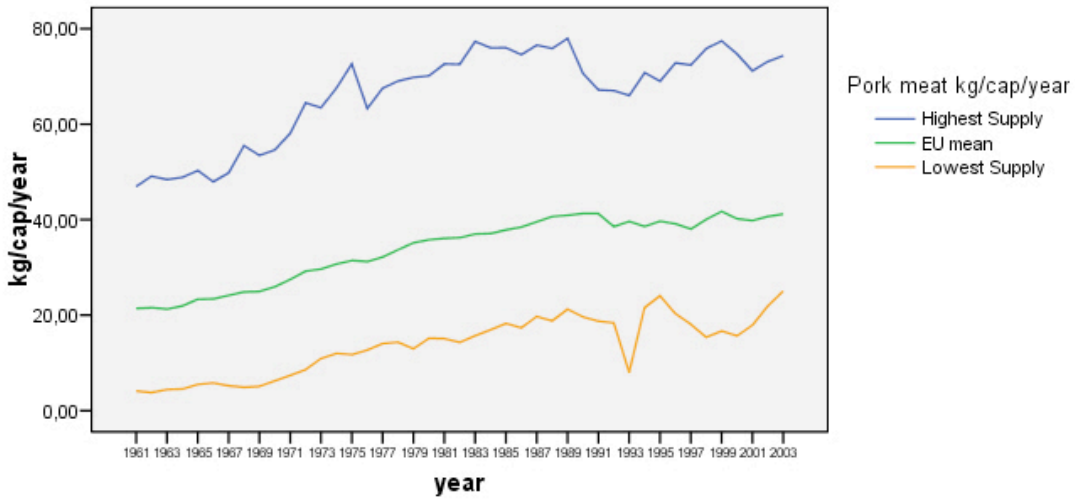
In 2003 the country with the significantly highest supply of pig meat in the European Union was Austria with 74 kg/capita/year. Decidedly lower, but still above average are Spain (67 kg/capita/year), Denmark (63 kg/capita/year), Germany (54 kg/capita/year), Hungary (52 kg/capita/year), Poland (50 kg/ capita/year), Cyprus (46 kg/capita/year), Ireland and Italy (44 kg/capita/year), the Czech Republic (43 kg/capita/year) and Portugal (42 kg/capita/year). The remaining countries show values below the average with Latvia (25 kg/capita/ year), the United Kingdom (26 kg/capita/year), Greece and Romania (28 kg/ capita/year) exhibiting the lowest.

In 1961 the recorded bovine meat supply was decidedly lower with the highest values in Hungary (47 kg/capita/year), Austria (41 kg/capita/year) and Germany (38 kg/capita/year). The lowest values could be found in Cyprus and Greece (4 kg/capita/year), Italy and Spain (8 kg/capita/year).

Throughout the years Austria and Hungary were the countries in the European Union with the highest supply in bovine meat. In Austria a steady increase was observed while in Hungary the supply increased till it reached a peak supply in 1989 with 78 kg/capita/year and then decreased to a low 41 kg/capita/year in 1997 to show a slight increase since then to 52 kg/capita/year in 2003.

In 1993 a sudden decrease in Lithuania to 8 kg/capita/year stands out. In 1992 a supply of 18 kg/capita/year was observed and later in 1994 the supply had increased again to 22 kg/capita/year again.

Figure 23: Average Supply of Pork Meat in the EU



Source of raw data: FAO, 2008

The Supply of Mutton and Goat Meat from 1961 to 2003

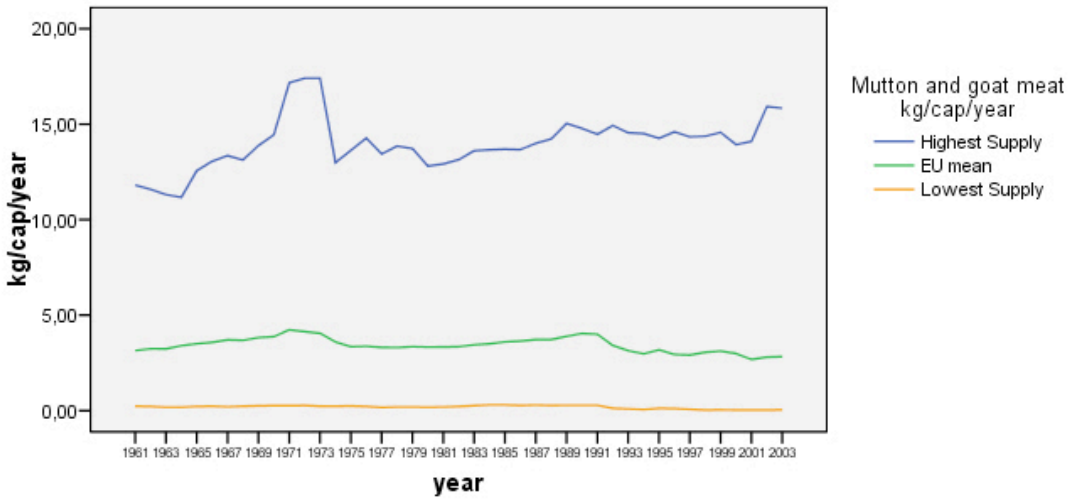
The average supply of mutton and goat meat in 1961 in the European Union is clearly lower than the supply of pork or bovine meat with a value of 3 kg/capita/year, and stays the same in 2003. Detailed figures of the supply of mutton and goat meat in the EU for 1961, 1993 and 2003 can be found in Annex 20.

There are few countries with significantly higher supplies of mutton and goat meat than the average. In 2003 those countries were Cyprus (16 kg/capita/year), Greece (12 kg/capita/year), Spain and the United Kingdom (6 kg/capita/year), Ireland and Bulgaria (5 kg/capita/year). France, Portugal and Romania

have an average supply of 3 kg/capita/year in 2003. All others are under average with the lowest values in Poland, Czech Republic, Latvia, Lithuania, Hungary, Estonia, Finland and Slovakia under 0.5 kg/capita/year.

In 1961 the highest supply of mutton and goat meat was recorded in the United Kingdom (12 kg/capita/year), closely followed by Ireland (11 kg/capita/year) and Greece (9 kg/capita/year). Other countries above average were Cyprus (7 kg/capita/year), Bulgaria (6 kg/capita/year) and Spain with 4 kg/capita/year slightly above the average.

Figure 24: Average Supply of Mutton and Goat Meat in the EU



Source of raw data: FAO, 2008

The Supply of Red Meat from 1961 to 2003

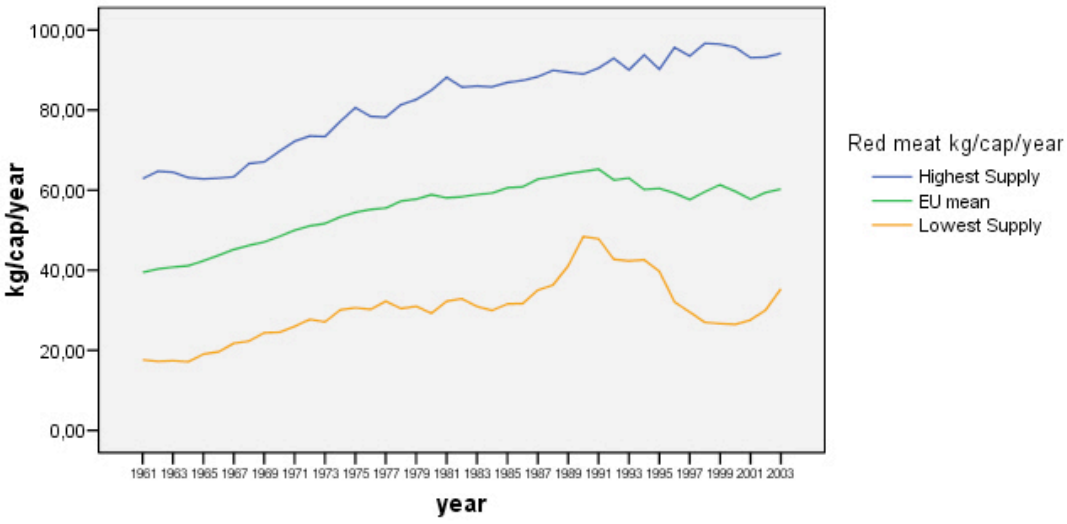
The average supply of red meat (bovine meat, pork, mutton and goat meat) in the European Union in 1961 was 40 kg/capita/year; a value that increased by 50% to 60 kg/capita/year in 2003. Specifics of the supply of red meat in the European Union for 1961, 1993 and 2003 can be found in Annex 21.

The countries that contributed most to such a high value of red meat supply in 2003 are Austria with the highest number of 94 kg/capita/year, followed by Denmark (93 kg/capita/year) and Spain (88 kg/capita/year). Other countries with a high red meat supply are Ireland (74 kg/capita/year), Italy (70 kg/capita/year),

Cyprus (69 kg/capita/year), France (68 kg/capita/year), Germany (67 kg/capita/year), Slovenia (64 kg/capita/year), Portugal (63 kg/capita/year) and Sweden (62 kg/capita/year). All other countries are under average with the lowest value recorded in Latvia (35 kg/capita/year), Romania (39 kg/capita/year), Slovakia and Estonia (41 kg/capita/year).

In 1961 the highest supply of red meat was observed in the United Kingdom (63 kg/capita/year), Austria (60 kg/capita/year), Germany and Hungary (58 kg/capita/year) and Denmark (53 kg/capita/year). All others were under average. The lowest supply could be found in Portugal and Spain (18 kg/capita/year) and Greece (19 kg/capita/year).

Figure 25: Average Supply of Red Meat in the EU



Source of raw data: FAO, 2008

Discussion of Red Meat Supply in the European Union

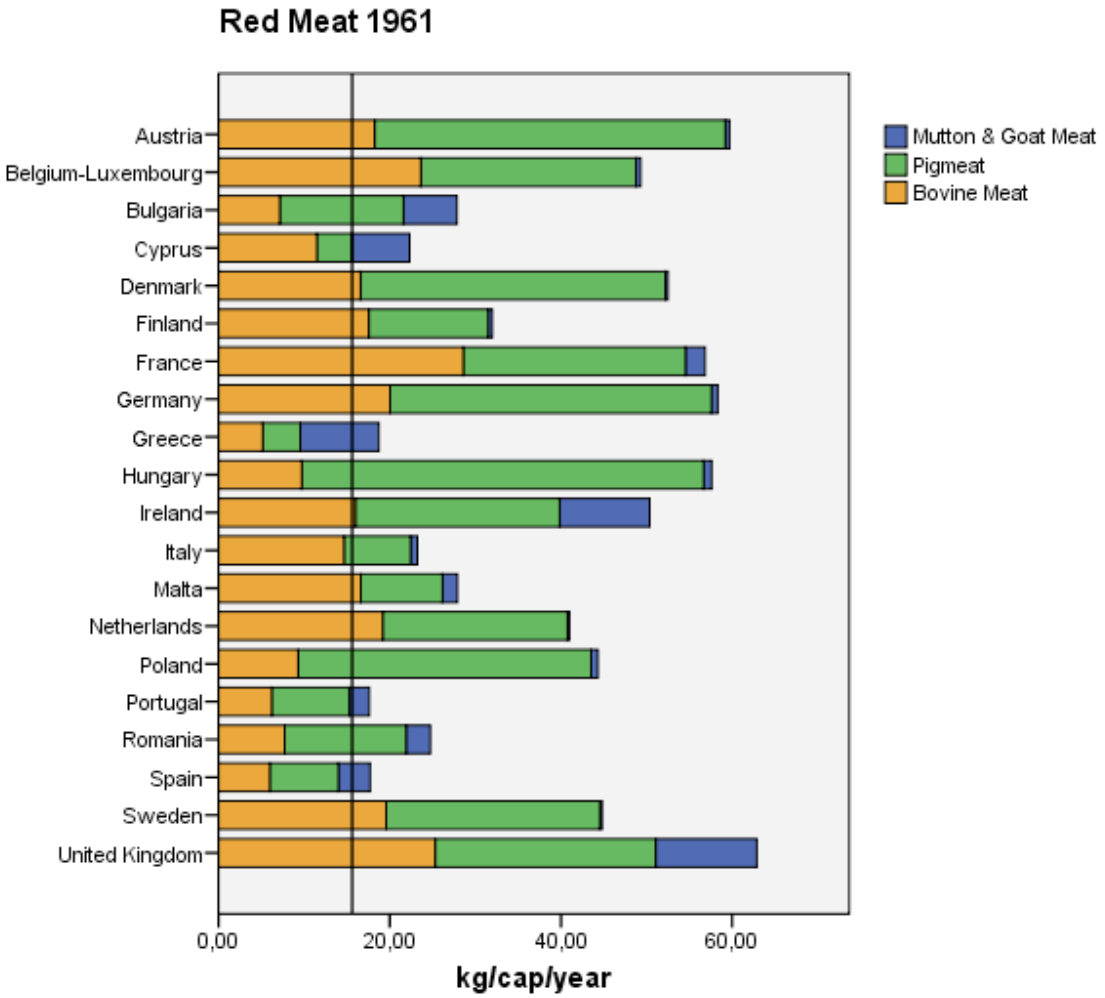
Meat is a valuable source of protein, iron, zinc, vitamin B12 and other nutrients. However the evidence that red meat and processed meat may cause colorectal cancer is convincing. Also, is a diet high in animal fats often relatively high in energy and saturated fatty acids, thus a limitation of red meat intake seems advisable [AICR, 2007].

The population average consumption of red meat should be no more than 300 g a week (15.6 kg/capita/year). The personal recommendation is a consumption under 500 g per week (26 kg/capita/year) and to eat red meat as unprocessed as possible [AICR, 2007].

Most countries in the European Union exceeded the public health goal in 1961, though quiet a few countries accomplished to stay under the personal recommendation.

Figure 26: Proportions of Red Meat 1961

The recommendation line represents the public health goal of maximum 300 g/person/week (≙ 15.6 kg/capita/year)



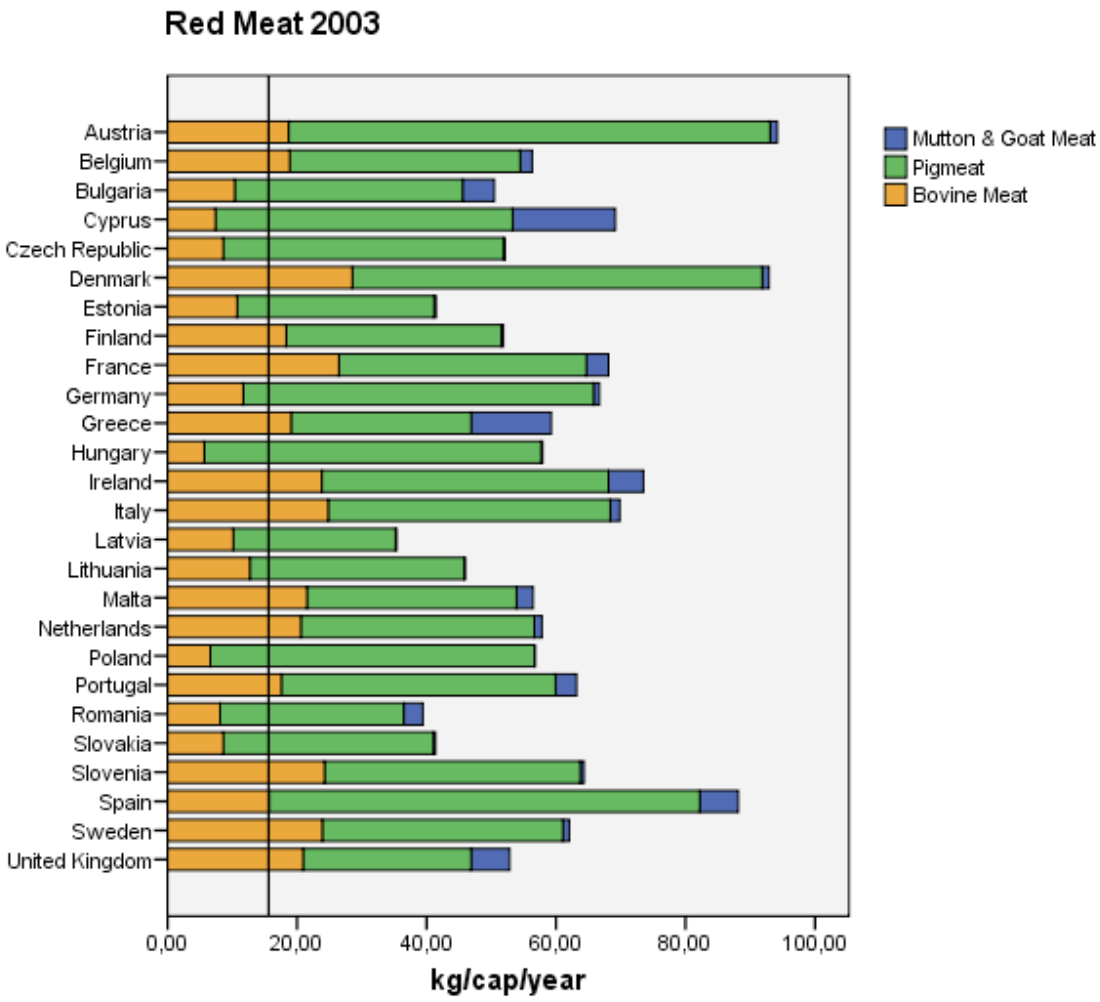
Source of raw data: FAO, 2008

In 2003 a clear increase of red meat supply is visible. None of the countries manage to come even close to the public health goal and only Latvia approaches, but still does not achieve, the personal recommendation. This development is alarming and action should be taken to reverse it.

Pork makes out the by far highest proportion of the red meat supply, next to bovine meat. Mutton and goat is only consumed in small quantities and a clear preference is visible in Cyprus and Greece.

Figure 27: Proportions of Red Meat 2003

The recommendation line represents the public health goal of maximum 300 g/person/week (≙ 15.6 kg/capita/year)



Source of raw data: FAO, 2008

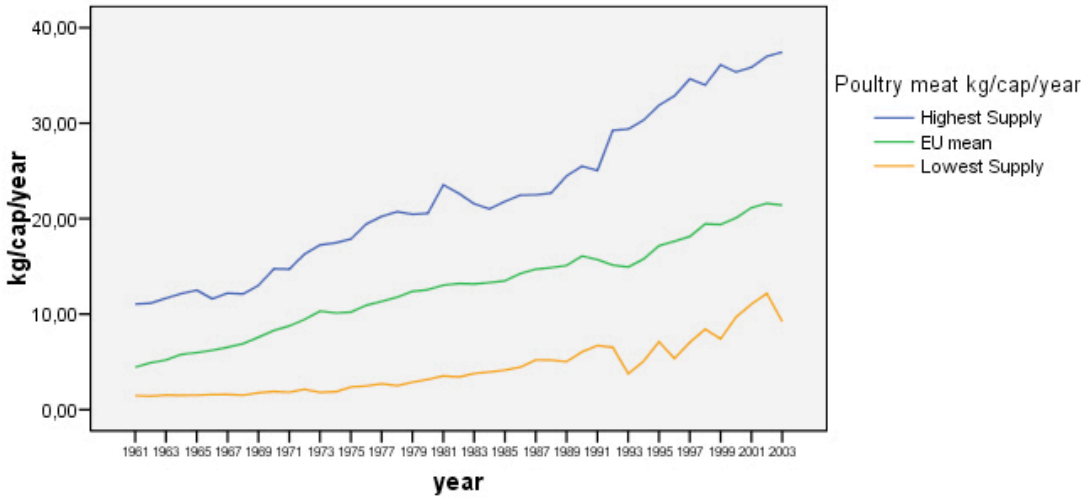
The Supply of Poultry Meat from 1961 to 2003

With an average supply of 5 kg/capita/year of poultry in 1961 this value increased by 320% to 21 kg/capita/year in 2003.
A clear steady increase can be observed. More details on the supply of poultry meat can be found in Annex 22.

The highest supply of poultry in 2003 in the European Union was recorded in Cyprus with 37 kg/capita/year; in Spain, Hungary and the United Kingdom an average supply of 30 kg/capita/year was available. The lowest supply in 2003 could be found in the Netherlands (9 kg/capita/year), Sweden (13 kg/capita/year) and Germany (14 kg/capita/year). Under average were also Lithuania and Finland (15 kg/capita/year), Italy and Latvia (16 kg/capita/year), Austria (17 kg/capita/year), Denmark (18 kg/capita/year), Greece, Romania, Poland and Bulgaria (19 kg/capita/year). All other countries were over average.

In 1961 France was clearly over average with 11 kg/capita/year. The poultry supply in Hungary was significantly lower with 9 kg/capita/year. Only Denmark and Belgium-Luxembourg (7 kg/capita/year) and the United Kingdom (6 Belgium-Luxembourg) were also over the average of 5 kg/capita/year.

Figure 28: Average supply of poultry meat in the EU



Source of raw data: FAO, 2008

Discussion of Meat Supply in the European Union

The global livestock sector is growing at an unprecedented rate due to population growth, rising incomes and urbanisation. The annual meat production worldwide is expected to increase from 218 million tonnes in 1997-1999 to 376 million tonnes by 2030. There is a strong relationship between income levels and the consumption of animal protein, including meat, milk and eggs, which is increasing at the expense of staple foods. The current trend to an increasing animal protein consumption is unlikely to be reversed in countries with increased consumer resources, but is probably not conductive to human health in terms of prevention of chronic disease. Meat is a major source for cholesterol and thus a risk factor for CVDs, hence meat intake should be controlled [WHO/FAO, 2002]. People who eat meat are generally advised to prefer poultry to red meat [AICR, 2007].

To analyse this trend of increased meat supply more thoroughly a ratio of vegetal to animal supply was calculated.
Detailed numbers of the vegetal-animal ratio can be found in Table 7 and Table 8 for 1961 and 2003 for the countries that have available data for both years. A clear decrease in the vegetal-animal ratio is obvious.

Table 7: Ratio between Vegetal and Animal Products in 1961
(for the EU member countries of 2009; only countries with data for 1961 and 2003)

	1961		
	Vegetal Products [kcal/capita/day]	**Animal Products [kcal/capita/day]**	**vegetal/animal ratio**
Austria	2170	1020	2,13
Belgium-Luxembourg	1972	969	2,03
Bulgaria	2767	423	6,54
Cyprus	2163	309	7,00
Denmark	2042	1145	1,78
Finland	1976	1289	1,53
France	2181	1014	2,15
Germany	1944	944	2,06
Greece	2448	375	6,54
Hungary	2132	951	2,24
Ireland	2158	1195	1,81
Italy	2462	452	5,45
Malta	2264	622	3,64
Netherlands	2140	918	2,33
Poland	2374	908	2,62
Portugal	2128	346	6,16
Romania	2425	428	5,67
Spain	2277	355	6,41
Sweden	1800	1035	1,74
United Kingdom	2015	1275	1,58
mean value	**2192**	**799**	**2,74**

Source of raw data: FAO, 2008; own calculation

In 1961 eight countries had a ratio over 3. Cyprus shows the highest value of 7, Bulgaria and Greece follow with 6.54; Spain has a ratio of 6.41, Portugal 6.16, Romania 5.67, Italy 5.45 and Malta 3.64. The lowest vegetal-animal ratio of 1961 was found in Finland with 1.53. Followed by the United Kingdom (1.58), Sweden (1.74), Denmark (1.78) and Ireland (1.81).

Table 8: Ratio between Vegetal and Animal Products in 2003
(for the EU member countries of 2009; only countries with data for 1961 and 2003)

	2003		
	Vegetal Products [kcal/capita/day]	**Animal Products [kcal/capita/day]**	**vegetal/animal ratio**
Austria	2512	1219	2,06
Belgium-Luxembourg	2513	1120	2,24
Bulgaria	2201	684	3,22
Cyprus	2267	979	2,32
Denmark	2212	1260	1,76
Finland	1979	1165	1,70
France	2290	1333	1,72
Germany	2414	1070	2,26
Greece	2837	829	3,42
Hungary	2400	1152	2,08
Ireland	2536	1181	2,15
Italy	2729	946	2,88
Malta	2546	975	2,61
Netherlands	2453	1042	2,35
Poland	2475	891	2,78
Portugal	2668	1079	2,47
Romania	2760	823	3,35
Spain	2455	966	2,54
Sweden	2059	1149	1,79
United Kingdom	2393	1057	2,26
mean value	**2435**	**1046**	**2,33**

Source of raw data: FAO, 2008; own calculation

In 2003 a changed picture presents itself. Only 3 countries reach a vegetal-animal ratio over 3. Greece shows the highest rate of 3.42, Romania (3.35) and Bulgaria (3.22) follow closely. The countries with the lowest vegetal-animal ratio in 2003 are Finland (1.70), France (1.72), Denmark (1.76) and Sweden (1.79).

With the high increases of poultry supply (320%), pork supply (95%) and the increases of milk and egg supply, and the decrease in potato, pulses and cereal supply this development is hardy surprising, even though the fruit and vegetable supply increased.

It is clearly visible that countries with peak ratios in 1961 adjusted their supply ratio to the European mean and that in general the vegetal-animal ratio is decreasing. In chapter 4.4. the growing similarity of food supply in the European Union will be analysed and discussed more thoroughly.

4.2.8. Fish and Seafood Supply

The average supply of fish and seafood in 1961 in the European Union was about 15 kg/capita/year thus being significantly lower than the average supply in 2003 with 24 kg/capita/year, reflecting an increase by 60%. More details on the supply of fish and seafood in the European Union from 1961, 1993 and 2003 can be found in Annex 23.

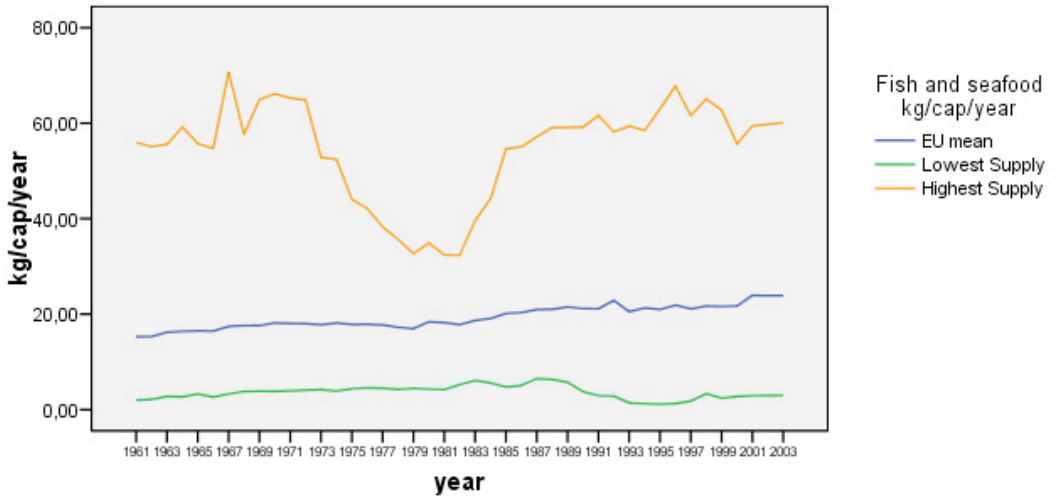
Lithuania and Portugal are far above average in 2003 with a supply of fish and seafood of 60 kg/capita/year. Malta has a very high supply as well with 50 kg/capita/year. Over average are also Spain (47 kg/capita/year), Sweden (34 kg/capita/year), Finland (33 kg/capita/year), France (31 kg/capita/year), Cyprus (28 kg/capita/year) and Italy (26 kg/capita/year). All other countries were below average in 2003. A very low supply in 2003 was recorded in Bulgaria and Romania with only 3 kg/capita/year, Hungary (5 kg/capita/year), Slovakia (7 kg/capita/year) and Slovenia (8 kg/capita/year).
For Belgium and Luxembourg the last available data on fish and seafood supply is from 1999. Up to 1999 the fish and seafood supply in Belgium and Luxembourg was steadily increasing to 22 kg/capita/year in 1999.

In 1961 the countries with the lowest supply were again Hungary (2 kg/capita/year), Romania and Bulgaria (3 kg/capita/year) and also Poland and Cyprus (7 kg/capita/year). A high supply was recorded 1961 in Portugal (56 kg/capita/year). Also clearly over average were Sweden (27 kg/capita/year), Spain (26 kg/capita/year), the United Kingdom and Greece (20 kg/capita/year), France, Belgium-Luxembourg and Finland (18 kg/capita/year).

The country with the by far highest supply of fish and seafood is traditionally Portugal, only decreasing between 1975 to 1984 going down to a value of 26 kg/capita/year in 1979 (see Figure 29).

Lithuania strongly increased the fish and seafood supply in the last 3 recorded years from an average of 27 kg/capita/year in 1992 to 1999, to 60 kg/capita/ year in 2001 to 2003.

Figure 29: Average Supply of Fish and Seafood in the EU



Source of raw data: FAO, 2008

Discussion of Fish and Seafood Supply in the European Union

The worlds fishing areas have mostly reached their maximum potential for fisheries production, therefore a future substantial increase in total catch is unlikely. However, aquaculture production has been growing, thus offsetting part of the reduction in ocean fish catch [WHO/FAO, 2002].

Fish consumption is associated with a reduced risk of coronary heart disease. Oily fish contains long-chain unsaturated fatty acids, which influence inflammatory processes in the body [AICR, 2007]. In high-risk populations, an optimum fish consumption of 40 to 60 g per day would lead to approximately a 50% reduction in death from coronary heart disease. One to two servings of fish per week are recommended, though recommending an increased fish and seafood consumption needs to be balanced against economical and sustainability concerns [WHO/FAO, 2002].

4.2.9. Supply of Alcoholic Beverages

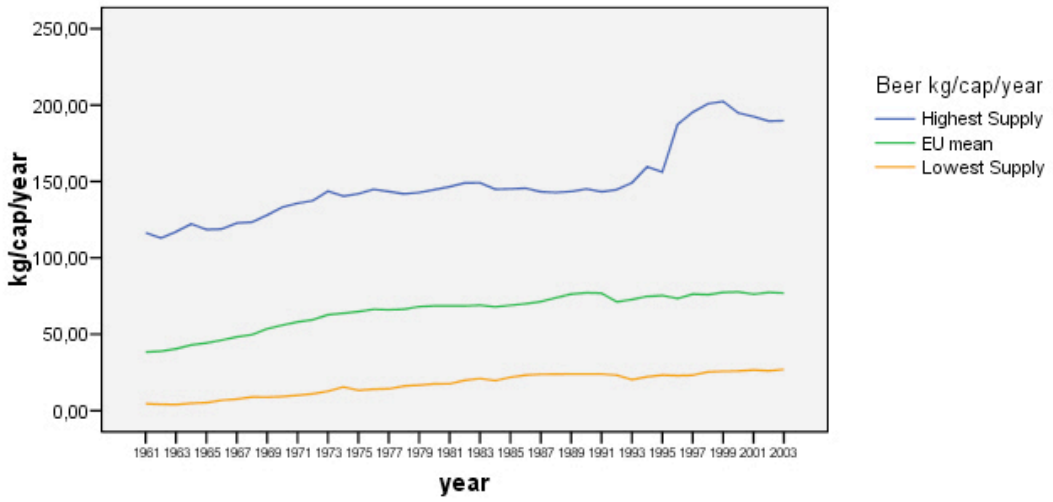
The Supply of Beer from 1961 to 2003

The beer supply in the European Union in 1961 was with an average of 38 kg/capita/year much lower than in 2003, increasing by 103% to an average supply of 77 kg/capita/year. Details on the supply of beer in the European Union can be viewed in Annex 24 for 1961, 1993 and 2003.

The countries with the lowest beer supply in 1961 were Portugal and Greece (5 kg/capita/year), Italy (7 kg/capita/year) and Cyprus (8 kg/capita/year). Belgium-Luxembourg reached the by far highest supply of beer in the European Union in 1961 with 116 kg/capita/year, followed by Germany (92 kg/capita/year), the United Kingdom (90 kg/capita/year), Austria (81 kg/capita/year), Denmark (75 kg/capita/year) and Ireland (58 kg/capita/year). All other countries were below average.

In 2003 a changed picture presents itself. Ireland is 2003 the country with the highest beer supply (190 kg/capita/year), followed by the Czech Republic (158 kg/capita/year). A beer supply around 100 kg/capita/year can be observed in Austria, Germany, the United Kingdom, Belgium and Denmark. Above average are also Slovakia (90 kg/capita/year), Finland (89 kg/capita/year), Netherlands (80 kg/capita/year) and Lithuania (79 kg/capita/year).

Figure 30: Average Supply of Beer in the EU



Source of raw data: FAO, 2008

In Ireland there has been an increase in the first decade from 58 kg/capita/year in 1961 to 80 kg/capita/year in 1971, then the beer supply in Ireland stayed steady till 1988 and then increased rapidly to 202 kg/capita/year in 1999. In the last three years a slight decline is observable.

In Germany the peak supply of beer had been reached in 1983 (149 kg/capita/ year) and then slowly decreased to 110 kg/capita/year in 2003.

Similar in the Czech Republic the peak supply had been reached in 1997 with 161 kg/capita/year and stayed almost steady since.

The Supply of Wine from 1961 to 2003

Average wine supply in 1961 in the European Union was with 26 kg/capita/year clearly higher than in 2003 with only 21 kg/capita/year. A decrease by 19% was observed. In Annex 25 a detailed list of the wine supply in the EU can be found for 1961, 1993 and 2003.

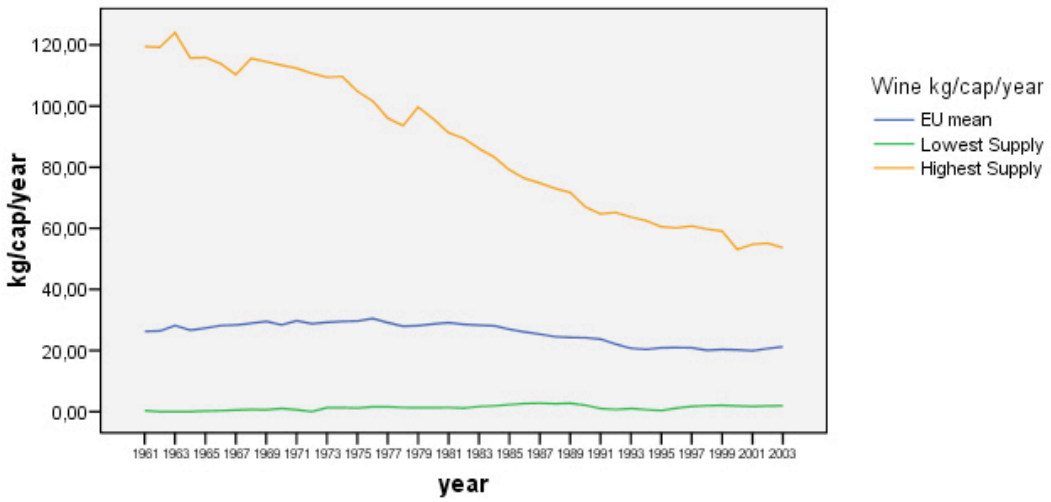
In 1961 the values of the wine supply varied a lot between countries. The highest numbers were recorded in France (119 kg/capita/year); followed by Italy (108 kg/capita/year), Portugal (65 kg/capita/year), Spain (59 kg/capita/year),

Greece (34 kg/capita/year) and Hungary close to the average with 27 kg/capita/year. All other countries were below average with the lowest values in Poland, Finland and Malta under 1 kg/capita/year.

Those numbers changed significantly over time. In 2003 the highest values were much lower than the highest values in 1961 with France still having the highest supply (54 kg/capita/year), followed by Portugal (53 kg/capita/year), Italy (51 kg/capita/year), Spain (37 kg/capita/year). In Hungary, Denmark, Austria, Belgium and Greece a supply of around 30 kg/capita/year was recorded. Romania and Germany (23 kg/capita/year) and also Cyprus (21 kg/capita/year) were also above average.
The lowest values were observed in Poland (2 kg/capita/year), Malta (3 kg/capita/year), Bulgaria (3 kg/capita/year) and Estonia (7 kg/capita/year).

The development of wine supply in Portugal shows a decided peak in 1971 with 111 kg/capita/year, while the development of wine supply in France and Italy was steadily decreasing.

Figure 31: Average Supply of Wine in the EU



Source of raw data: FAO, 2008

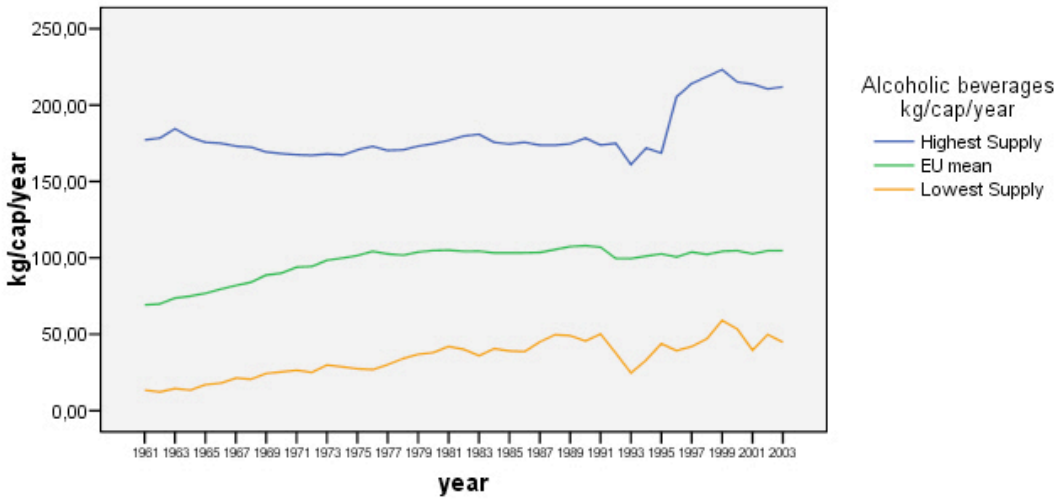
The Supply of Alcoholic Beverages from 1961 to 2003

In 1961 the average supply of alcoholic beverages, including beer, wine, fermented beverages and other alcoholic beverages, in the European Union was 69 kg/capita/year, thus being decidedly lower, exactly 52% lower, than the average supply in 2003 with 105 kg/capita/year. Specific numbers for the supply of alcoholic beverages can be viewed in Annex 26.

In 1961 the highest supply of all alcoholic beverages was recorded in France (177 kg/capita/year). Other countries with a high supply also were Belgium-Luxembourg (127 kg/capita/year), Italy (116 kg/capita/year); Austria, Germany, United Kingdom at about 100 kg/capita/year; Portugal, Denmark and Spain at about 80 kg/capita/year. The lowest supply of alcoholic beverages was noted in Malta (13 kg/capita/year), Cyprus (22 kg/capita/year), Finland (27 kg/capita/year).

Even though the supply of alcoholic beverages increased in all countries, in some it grew unproportionally more. Ireland had an alcoholic beverages supply of 212 kg/capita/year in 2003, compared to only 62 kg/capita/year in 1961, which was just below average. This development can be ascribed to the strong increase in beer supply, though the wine supply rose too.
Above the 2003 average supply of alcoholic beverages were also the Czech Republic (176 kg/capita/year), Austria (155 kg/capita/year), Germany (139 kg/capita/year), Denmark and Belgium (131 kg/capita/year), the United Kingdom and Portugal (124 kg/capita/year), Hungary (114 kg/capita/year) and Spain (106 kg/capita/year). A low supply of alcoholic beverages in 2003 show Malta (45 kg/capita/year), Bulgaria (54 kg/capita/year) and Greece (64 kg/capita/year).

Figure 32: Average Supply of Alcoholic Beverages in the EU



Source of raw data: FAO, 2008

Discussion of the Supply of Alcoholic Beverages in the European Union

There is convincing evidence that a moderate alcohol consumption lowers the risk for coronary heart disease [WHO/FAO, 2002]. All alcoholic drinks have the same effect [AICR, 2007]. Nonetheless, other cardiovascular and health risks associated with alcohol do not support a general positive recommendation [WHO/FAO, 2002].

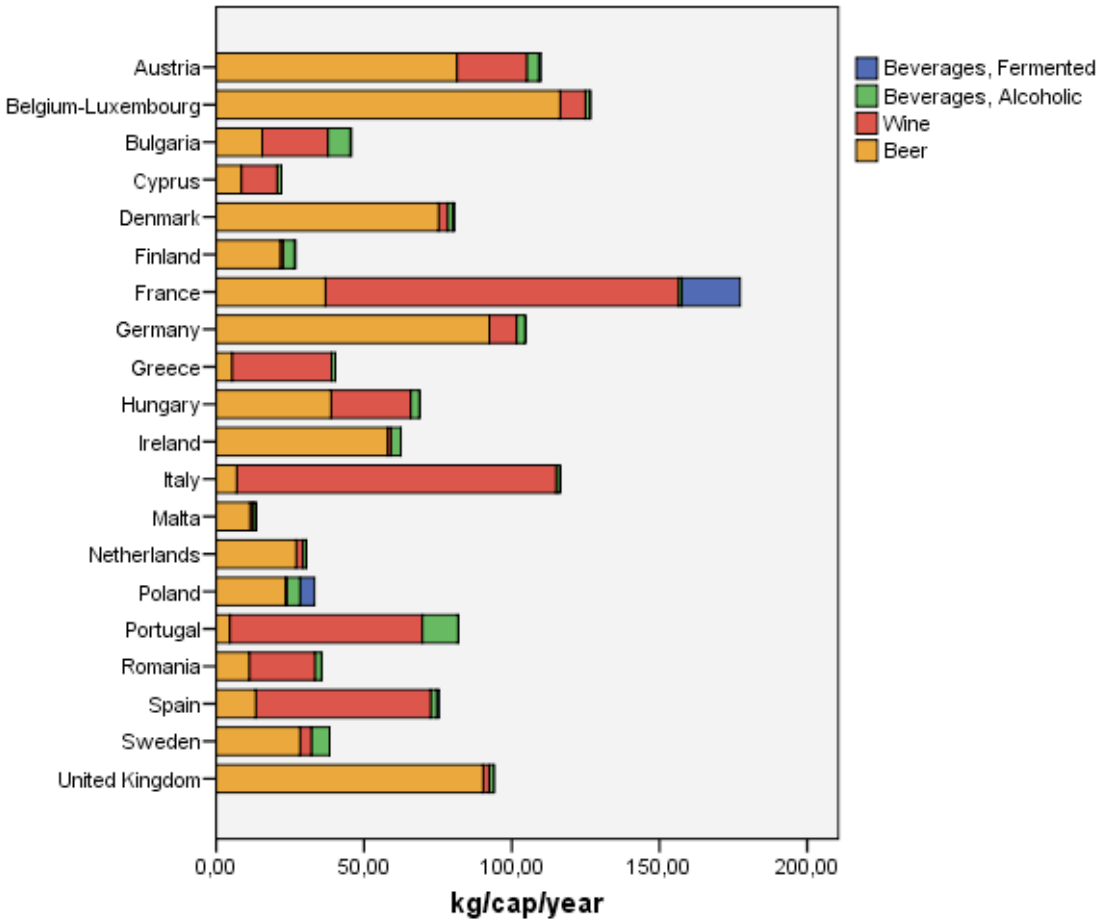
Furthermore, alcoholic drinks may cause various types of cancer. The convincing evidence on cancer justifies a recommendation not to drink alcoholic drinks [AICR, 2007].

The personal recommendations to limit alcohol consumption from the AICR restrict intake of alcoholic drinks to no more than two drinks a day for men, and one drink a day for women. As a public health goal, countries should try to reduce the proportion of the population who is drinking more than the recommended limits by one third every ten years [AICR, 2007].

In Figure 33 distinct differences between amount and type of consumed alcoholic beverage in 1961 can be observed. While in some countries wine was preferred (France, Greece, Italy, Portugal, Romania, and Spain) others had a

considerable supply of beer (Austria, Belgium-Luxembourg, Denmark, Finland, Germany, Ireland, Malta, Netherlands, Poland, Sweden and the United Kingdom). France had the decidedly highest supply of alcoholic beverages, mostly ascribed to wine, while Malta had the lowest.

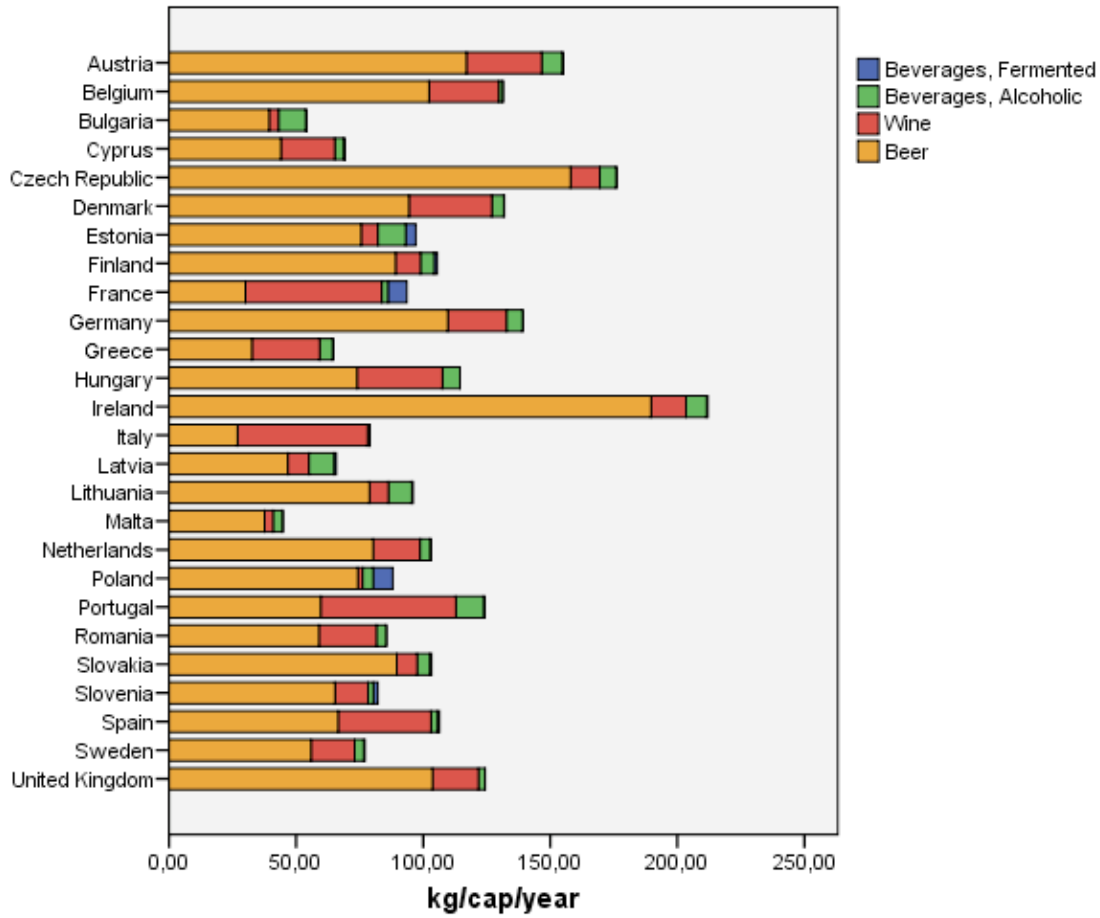
Figure 33: Proportions of Alcoholic Beverages 1961



Source of raw data: FAO, 2008

In 2003 the picture has significantly changed. The general total supply of alcoholic beverages increased significantly and the proportions shifted to favour beer. Even in France, where the supply of wine was so decidedly higher than the beer supply, the wine supply lessened considerably. Besides France only in Italy exceeds the wine supply the supply of beer.

Figure 34: Proportions of Alcoholic Beverages 2003



Source of raw data: FAO, 2008

The supply of alcoholic beverages should be reduced, adequate political action to promote abstinence from alcohol should be taken. A starting point for action should lie with the beer supply which is so markedly increasing.

4.3. Development of the Proportion of Macronutrients

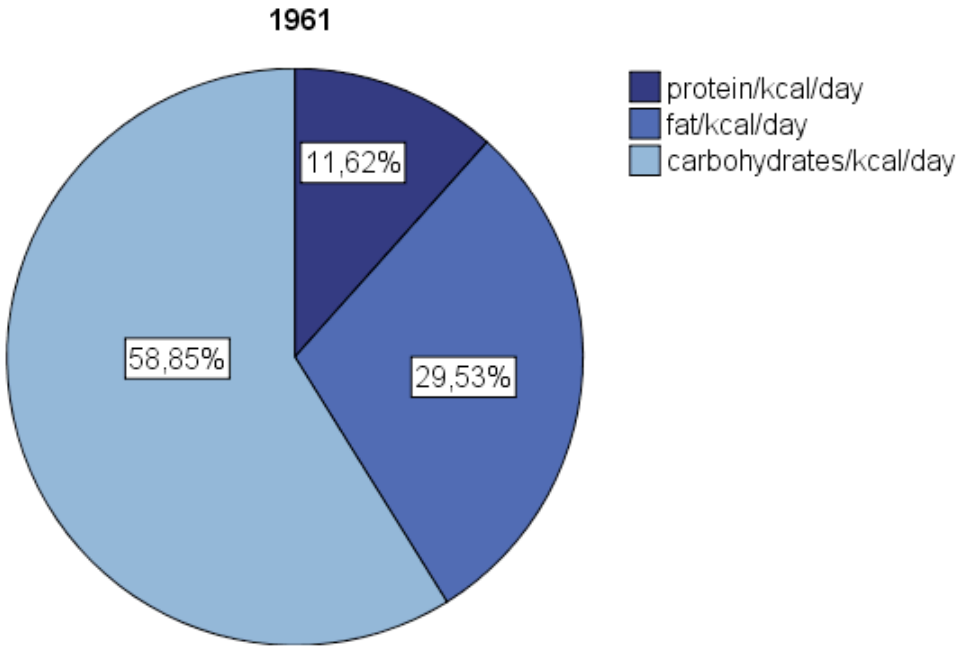
The discussed changes in major food groups, let us expect a change in the proportions of macronutrients.

The supply of fat in the European Union increased from 30% to 34%, thus presenting the greatest change in macronutrient supply. An increase of vegetable oil supply and supply of oil crops probably accounts for that.

The increase of fat supply goes at the expense of carbohydrate supply. The percentage of carbohydrates in the daily diet was reduced from 59% in 1961 to 53% in 2003. Since the supply of potatoes, pulses and cereals diminished, this is not surprising.

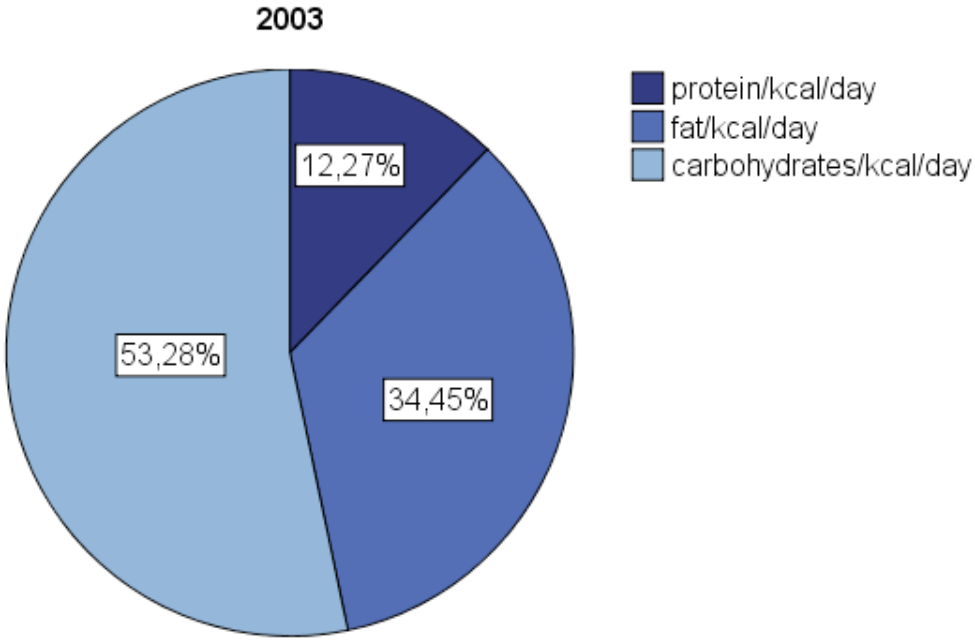
The supply of protein stayed stable and changed only by 0.65 %.

Figure 35: Proportion of Macronutrients in the Daily Diet 1961



Source of raw data: FAO, 2008

Figure 36: Proportion of Macronutrients in the Daily Diet 2003



Source of raw data: FAO, 2008

Changes in Average Energy Supply

Since 1961, the energy supply in the European Union increased from an average of 2990 kcal/capita/day to 3395 kcal/capita/day in 2003. This increase is mostly accounted for by the increase in fat supply from 883 kcal/capita/day in 1961 to 1170 kcal/capita/day in 2003.

The protein supply increased slightly from the European average of 347 kcal/ capita/day in 1961 to 417 kcal/capita/day in 2003; and an even smaller increase in carbohydrate supply was observed (1760 kcal/capita/day in 1961, 1809 kcal/ capita/day in 2003).

In Annex 27-32 detailed charts of developments in the proportions of macronutrient supply of all participating countries for the year 1961, 1993, 2003 can be viewed.

Discussion of Macronutrient Proportions in the European Union

A joint expert consultation of the WHO and FAO determined international ranges of goals for population nutrient intake.

For fat the ideal range is appointed to be between 15 to 30% of total energy intake. For consistent good health, a total fat energy of at least 20% is recommended [WHO/FAO, 2002]. While the average European fat supply in 1961 was still within the range, the fat supply in 2003 is far higher than the recommended goal and the trend to an increase is unfavourable. Rising incomes in developing countries also lead to an increase in the proportion of energy from fat [WHO/FAO, 2002]. Even though the fat supply is probably higher than the actual intake, because it is part of the nature of FBS to overestimate [SERRA-MAJEM, 2003], this development should be monitored and suitable action should be undertaken.

The total carbohydrate supply should be between 55 to 75% of total energy [WHO/FAO, 2002], therefore the decreasing trend from an acceptable 59% in 1961 to a 53% in 2003 below range is disadvantageous and intake of carbohydrates needs to be promoted, especially when considering that the actual intake is still lower than the available amount.

The protein supply range is fixed to be between 10 to 15% [WHO/FAO, 2002], therefore the protein supply in the European Union is and was well within the range and thus unobjectionable.

4.4. Consumption Similarity in European Countries

The consumption similarity, calculated with the aforementioned CSI used by SCHMIDHUBER and TRAILL [2005], represents an aggregate measure for the overlap of food consumption patterns in two countries. The calculation is based on the energy content in the food groups.

The CSI was calculated for all available countries for the years 1961, 1973, 1983, 1993 and 2003. For the first three analysed years, only a limited number of countries has available data. An overview of the available data for country and year can be found in in Annex 1. For 1993 and 2003 the complete set of data is available.

Similar to the findings of SCHMIDHUBER and TRAILL did the overall similarity between European Countries increase steadily. The data also reveals, that geographic proximity, that has traditionally been a crucial factor for similarity, still plays a vital role. One example is Austria and Germany, which always had a high similarity (>90%), in 2003 at an all time high with 96% similarity. However, in the last decades not only countries that are close to each other have a similar consumption, but even countries without close proximity grew in similarity.

In the following section the structure of the consumption similarity will be discussed in detail.

4.4.1. The Changing Structure of Consumption Similarity in the European Union in Detail

Consumption Similarity in 1961

In 1961 countries had between none to four countries with a similarity above 90%. The highest similarity found in 1961 was 94% between Ireland and

Finland. The lowest similarity found in 1961 was 57% between Sweden and Romania. The average similarity between European Countries was 80%.

The country with the most similar countries in 1961 was Germany with Austria, Belgium-Luxembourg, Denmark and the United Kingdom.
Besides Germany, also France and surprisingly Ireland had a similarity higher or at 90% to Austria. France achieved 90% only with Austria.
Belgium-Luxembourg shows besides Germany expectedly also Denmark as a similarly consuming country. And Denmark exhibits in addition a similarity of 91% to the United Kingdom. Thus the two countries with a close similarity to the United Kingdom have also been mentioned: Germany and Denmark.

Spain is closely similar to Portugal, Italy and Cyprus. Italy also shows a high similarity to Greece. However, while Cyprus is generally considered a Mediterranean country, it shows no similarity stronger than 89% to Poland.

Bulgaria and Romania showed the highest similarity only to each other. With Poland and Hungary, and Sweden and the Netherlands it is the same case.

Consumption Similarity in 1973

In 1973 already a clear increase in similarity could be observed. In 1973 the average similarity is at 83%. The central and western European Countries grew closer to each other.
The highest similarity reached was 95% between Austria and Germany, and the United Kingdom and France. Those four countries all were in close similarity among each other in 1973.
The lowest similarity could be observed between Finland and Bulgaria (67%). Thus the lowest similarity of 1973 is 10% higher than it was in 1961.

Austria also showed high similarity to Belgium-Luxembourg and Netherlands, and also still Ireland. The Netherlands significantly increased the number of countries with high similarity to four: Austria, France, Sweden and the United Kingdom. Germany kept the countries it already was close with and added France with a similarity of 91%.

Ireland reached at least 90% with Austria as mentioned, Finland, Poland and the United Kingdom.

Cyprus clearly caught up with the other Mediterranean countries and exhibits in 1973 a similarity above 90% to Greece and Spain. Italy is the Mediterranean country with the most countries with a high similarity, namely Bulgaria, Greece, Portugal and Spain.
Malta still shows low similarity numbers, with the highest at 86% for Italy and Poland.

Bulgaria is still similar to Romania, but in 1973 also shows an increased similarity to Italy.
Poland shows 1973 a high similarity to Ireland, besides Hungary.

Consumption Similarity in 1983

In 1983 the overall similarity even further increased to an average of 85%. The highest similarity in 2003 is still at 95% but between the United Kingdom and Germany.
The lowest similarity in 2003 is only at 74% between Romania and Finland, and Portugal and Finland, thus again increasing the lowest value by 7% from the last analysed year.

Central, Western and Northern Europe again increased similarity. Austria, Belgium-Luxembourg, Denmark, France, Germany, Netherlands, Sweden, Ireland, Finland and the United Kingdom closed up on each other.

Ireland has also a very similar consumption as Hungary an Poland. Exhibiting increasing similarity to countries that have no geographical proximity.
Poland and Malta also still have a high similarity.

Greece, Portugal, Spain and Italy obtain a steady high similarity.
Portugal also shows high similarity to Romania, which also is very similar to Bulgaria.

Consumption Similarity in 1993

1993 is the first year where the complete data set of all countries is available, adding 6 new countries to the calculation. Nevertheless the average similarity in the European Union still increased to 86%.
The highest reached similarity is still 95%, this time again for Germany and Austria, Germany and Belgium-Luxembourg, and also the Czech Republic and the United Kingdom.
The lowest value is 72% between Austria and Romania. No increase of the lowest value is observed.

This time the country with the most similarities is the Czech Republic, with eleven countries of a similarity value at or above 90%. Those countries are Austria, Belgium-Luxembourg, Cyprus, Finland, France, Germany, Ireland, Netherlands, Slovakia, Sweden and the United Kingdom.

Still is geographic proximity of importance, countries with a high similarity still exhibited high values, but this first compact CSI table of all European Countries clearly shows growing similarity also independent of geographic regions. And also the number of countries that show a similarity higher than 90% increased rapidly.

For example Hungary shows 1993 a high similarity to Belgium-Luxembourg, Denmark, Germany, Ireland and Slovakia.

The Eastern countries, which have a complete dataset for 1993, show a high similarity as expected, though some display high similarity also to other regions. Estonia is most similar to Latvia, while Latvia also shows high similarity to Lithuania and Poland. Slovakia exhibits high similarity to the Czech Republic, Hungary, Malta, and Poland, but also Denmark, Germany, Ireland.

The Mediterranean countries still are closer to each other than to other countries. Except Malta, which is most similar to Poland and Slovakia.

Consumption Similarity in 2003

From 1993 to 2003 their was no increase of average consumption similarity in the European Union observed, it stayed stable at 86%. It is necessary to keep in mind, that some countries did not have data for years before 1993 and thus have not been included in the calculation before (see Annex 1).

With a similarity of 96%, Austria and Germany again exhibit the importance of geographical proximity. The lowest value in 2003 was 72% similarity between Belgium and Slovenia. The value still staying stable since 1983.

This year a slightly different trend is visible. While for some countries overall similarity increased significantly, for others overall similarity decreased and geographical regions begin to loose importance.
Portugal for example constantly exhibited one to three close similarities over the last decades. In 2003 it shows close similarity for Austria, Czech Republic, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania and the United Kingdom.

The United Kingdom shows the most similarities with Austria, Cyprus, Czech Republic, Finland, France, Germany, Hungary, Ireland, Latvia, Netherlands, Portugal and Sweden.

Other countries with high overall similarity are Czech Republic, France, Germany, Hungary, Ireland, Lithuania and Netherlands.

On the other hand the table shows decreased overall similarity for Belgium (highest value 87% with Germany) and Spain (see below). For some other countries the overall similarity just stayed low and did not increase.

This also causes that Mediterranean countries no longer show close similarity. Spain exhibits no similarity over 90%, the highest value is 89% with Italy. Greece also is still similar with Italy but no longer shows values over 90% for other Mediterranean countries. Cyprus, which was still close to Spain and Greece in 1961 and 1973, is in 2003 closer to France, Ireland, Netherlands,

Sweden and the United Kingdom. For Malta a high similarity is observed with Poland, and also Lithuania.

5. Conclusion

This study aims to analyse past trends of food supply of specified food items in the member states of the European Union of 2009. Data from 1961 to 2003 was used.
In the first chapter a thorough theoretical introduction to the topic of FBS is given. The historical background, characteristics of FBS, methodology and conceptual problems are discussed.
Part of the duties of the FAO is the collection and dissemination of data. To this purpose the FAO prepares and stores FBS data. To improve coverage, representativeness and accuracy, additional data is integrated. The accuracy of FBS as derived statistics depends on the reliability of the underlying statistical data. To further the quality of FBS, all statistical information, underlying concepts, definitions and methods undergo various consistency checks and comparisons to respective additional information.

FBS are a useful tool to show over-all trends in the food supply of a country, changes in dietary patterns and the degree of adequacy of food supply compared to nutritional demands over long time periods and are easily comparable to other countries.

Combined with data from household studies the food distribution can be estimated. Using defined cut-off points even the actual food intake can be estimated.
FBS make it possible to easily compare diets in the European Countries with a Consumer Similarity Index. The CSI has been calculated in this study along with other calculations for example a vegetal/animal ratio comparing the supply of foods from animals and plants.

In general an increasing trend in most supplies was noted. The vegetable and fruit supply both increase by almost 50%. In some countries a clear preference for fruit is visible, while in others vegetables seem to be preferred. In 1961 only

Greece and Italy reach the public health goal of 600g/person/day of fruit and vegetables; in 2003 significantly more countries achieve this goal.
Contrary to the increasing trend of vegetables is the average potato supply, that in general is decreasing, even though a few countries still show an increasing trend.
The pulses and cereal supply is decreasing as well. The supply of pulses is generally rather low at 3 kg/capita/year. Cereal is in 2003 lower than in 1961 but still higher than in 1993.

The average supply of vegetable oils increased by 50%, while the supply of animal fats stayed stable. Clear differences in oil and fat use can be distinguished between countries. Denmark and Hungary for example show an exceptionally high supply of animal fats, clearly higher than the supply of vegetable oils. In Spain and Italy, which also show a high lipid supply, vegetable oils are clearly preferred to animal fats.

The average red meat supply has been increasing since 1961. Responsible for this increase is mostly pork meat which increased by 95%. The maximum recommendations of red meat supply have been exceeded by far in 2003. The highest supplies in 2003 were recorded in Austria, Denmark and Spain.
The highest reported increase of 320% was found in the poultry supply. Since the supply for meat increased so decidedly the vegetal-animal ratio has been decreasing from 2.74 in 1961 to 2.33 in 2003.

While the wine supply decreased -especially in France and Italy- the beer supply increased strongly. The highest supply in 2003, of beer and alcoholic beverages in general, was found in Ireland followed by the Czech Republic.

In the proportions of macronutrients an increase of fat at the expense of carbohydrates was noted. The proportion of protein stayed stable.

The CSI expresses and undermines what also has been found in the analysis of the individual food groups. The harmonisation between the countries of the European Union is increasing. Geographical proximity is no longer the only factor for a high similarity in diets.

6. Annex

Annex 1: Available Data from the FAO of the European Union (member states from 2009), 2008

Country	Timeperiod with Available Data	EU Memberstate since
Austria	1961-2003	1995
Belgium	1999-2003	1957
Bulgaria	1961-2003	2007
Cyprus	1961-2003	2004
Denmark	1961-2003	1973
Germany	1961-2003	1957
Estonia	1992-2003	2004
Finland	1961-2003	1995
France	1961-2003	1957
Greece	1961-2003	1981
Ireland	1961-2003	1973
Italy	1961-2003	1957
Latvia	1993-2003	2004
Lithuania	1992-2003	2004
Luxembourg	1961-2003	1957
Malta	1961-2003	2004
Netherlands	1961-2003	1957
Poland	1961-2003	2004
Portugal	1961-2003	1986
Romania	1961-2003	2007
Sweden	1961-2003	1995
Slovakia	1993-2003	2004
Slovenia	1992-2003	2004
Spain	1961-2003	1981
Czech Republic	1993-2003	2004
Hungary	1961-2003	2004
United Kingdom	1961-2003	1973

Source of raw data: FAO, 2008

Annex 2: Available Commodities from the FAO of the European Union (member states from 2009), 2008

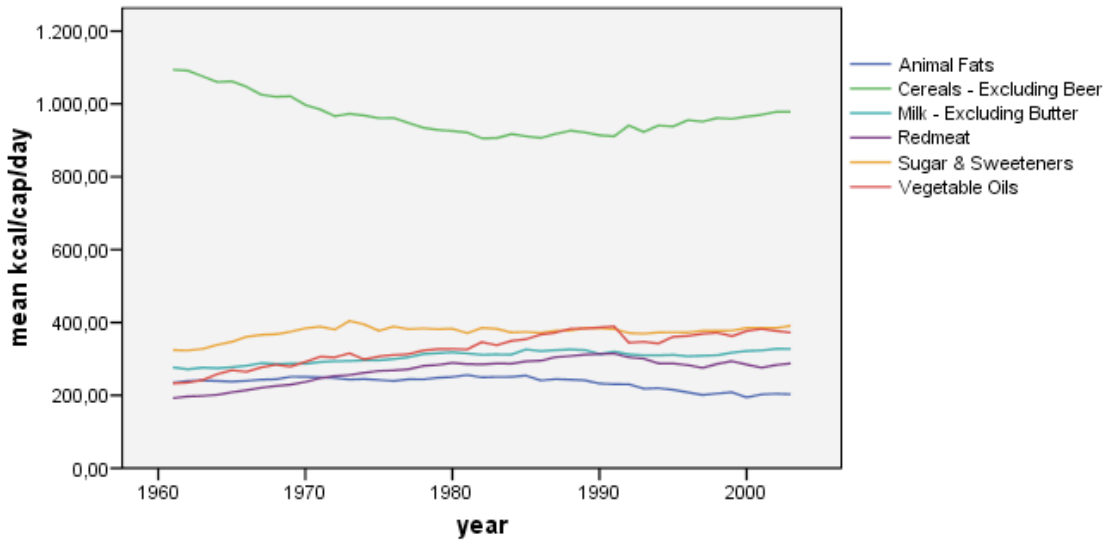
The 23 commodities used for this study are cursive.

Commodity number	Commodity	Commodity number	Commodity
1	*Grand Total*	56	Tomatoes
2	*Vegetal Products*	57	Onions
3	*Animal Products*	58	Vegetables, Other
4	*Cereals - Excluding Beer*	59	*Fruits - Excluding Wine*
5	Wheat	60	Oranges, Mandarines
6	Rice (Milled Equivalent)	61	Lemons, Limes
7	Barley	62	Grapefruit
8	Maize	63	Citrus, Other
9	Rye	64	Bananas
10	Oats	65	Plantains
11	Millet	66	Apples
12	Sorghum	67	Pineapples
13	Cereals, Other	68	Dates
14	Starchy Roots	69	Grapes
15	Cassava	70	Fruits, Other
16	*Potatoes*	71	Stimulants
17	Sweet Potatoes	72	Coffee
18	Roots, Other	73	Cocoa Beans
19	Sugarcrops	74	Tea
20	Sugar Cane	75	Spices
21	Sugar Beet	76	Pepper
22	*Sugar & Sweeteners*	77	Pimento
23	Sugar (Raw Equivalent)	78	Cloves
24	Sweeteners, Other	79	Spices, Other
25	Honey	80	*Alcoholic Beverages*
26	*Pulses*	81	*Wine*
27	Beans	82	*Beer*
28	Peas	83	Beverages, Fermented
29	Pulses, Other	84	Beverages, Alcoholic
30	Treenuts	85	*Meat*
31	*Oilcrops*	86	*Bovine Meat*
32	Soyabeans	87	*Mutton & Goat Meat*
33	Groundnuts (Shelled Eq)	88	*Pigmeat*
34	Sunflowerseed	89	*Poultry Meat*
35	Rape and Mustardseed	90	Meat, Other
36	Cottonseed	91	Offals, Edible
37	Coconuts - Incl Copra	92	*Animal Fats*
38	Sesameseed	93	Butter, Ghee
39	Palmkernels	94	Cream

Commodity number	Commodity	Commodity number	Commodity
40	Olives	95	Fats, Animals, Raw
41	Oilcrops, Other	96	Fish, Body Oil
42	*Vegetable Oils*	97	Fish, Liver Oil
43	Soyabean Oil	98	*Milk - Excluding Butter*
44	Groundnut Oil	99	*Eggs*
45	Sunflowerseed Oil	100	*Fish, Seafood*
46	Rape and Mustard Oil	101	Freshwater Fish
47	Cottonseed Oil	102	Demersal Fish
48	Palmkernel Oil	103	Pelagic Fish
49	Palm Oil	104	Marine Fish, Other
50	Coconut Oil	105	Crustaceans
51	Sesameseed Oil	106	Cephalopods
52	Olive Oil	107	Molluscs, Other
53	Maize Germ Oil	108	Aquatic Products, Other
54	Oilcrops Oil, Other	109	Aquatic Animals, Others
55	*Vegetables*	110	Miscellaneous
		111	*Redmeat*

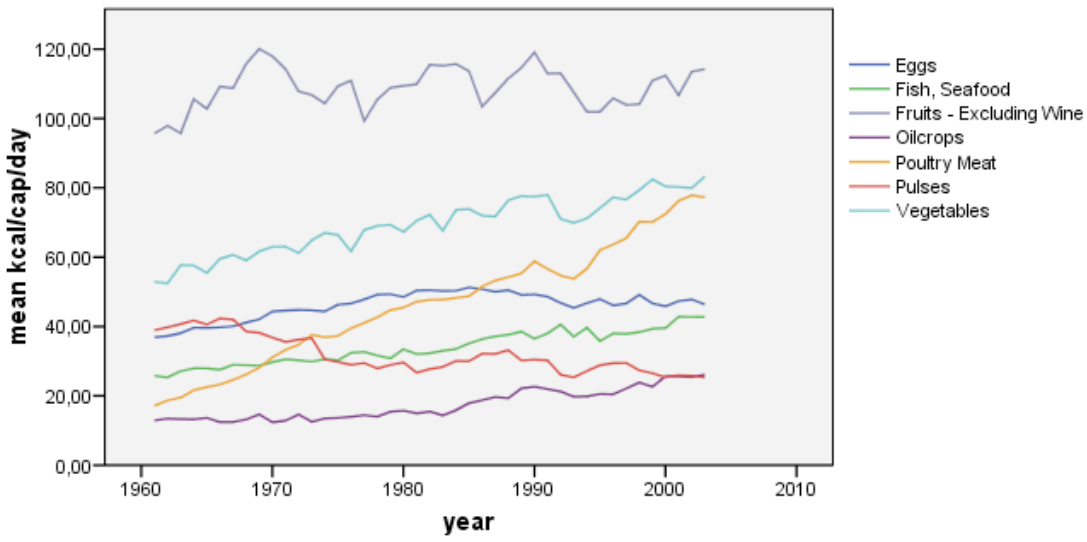
Source of raw data: FAO, 2008

Annex 3: Trends in Average Food Supply of Animal Fats, Cereals, Milk, Red Meat, Sugar & Sweeteners, Vegetable Oils in kcal/cap/day in the European Union



Source of raw data: FAO, 2008

Annex 4: Trends in Average Food Supply of Eggs, Fish & Seafood, Fruit, Oilcrop, Poultry Meat, Pulses, Vegetables in kcal/cap/day in the European Union



Source of raw data: FAO, 2008

Annex 5: Fruit Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	134	164	137
Belgium	59	106	69
Bulgaria	80	54	45
Cyprus	121	126	110
Czech Republic		61	80
Denmark	50	67	147
Estonia		46	74
Finland	42	75	92
France	54	84	95
Germany	79	111	113
Greece	133	173	147
Hungary	58	72	71
Ireland	40	70	138
Italy	95	137	131
Latvia		49	54
Lithuania		52	66
Malta	53	101	105
Netherlands	63	131	182
Poland	18	45	48
Portugal	79	106	116
Romania	37	65	65
Slovakia		46	60
Slovenia		76	143
Spain	52	120	113
Sweden	61	87	115
United Kingdom	56	80	116
EU-Average	**68**	**89**	**101**

Source of raw data: FAO, 2008

Annex 6: Vegetable Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	67	66	90
Belgium	85	119	131
Bulgaria	105	112	145
Cyprus	84	146	169
Czech Republic		71	72
Denmark	41	79	102
Estonia		49	100
Finland	18	59	71
France	151	124	143
Germany	50	72	90
Greece	115	266	276
Hungary	90	89	117
Ireland	40	78	82
Italy	131	161	178
Latvia		73	100
Lithuania		71	102
Malta	71	134	138
Netherlands	76	84	73
Poland	91	127	100
Portugal	95	156	181
Romania	84	134	179
Slovakia		70	70
Slovenia		68	73
Spain	162	161	143
Sweden	35	66	78
United Kingdom	60	90	91
EU-Average	**82**	**105**	**119**

Source of raw data: FAO, 2008

Annex 7: Potato Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	85	62	60
Belgium	133	111	84
Bulgaria	25	29	34
Cyprus	46	38	38
Czech Republic		85	69
Denmark	122	76	77
Estonia		114	121
Finland	115	66	72
France	115	74	65
Germany	139	81	72
Greece	32	78	65
Hungary	95	61	69
Ireland	139	123	120
Italy	54	42	41
Latvia		119	140
Lithuania		122	120
Malta	45	65	68
Netherlands	98	84	86
Poland	222	147	130
Portugal	88	125	125
Romania	69	74	96
Slovakia		126	72
Slovenia		47	51
Spain	125	90	79
Sweden	100	67	54
United Kingdom	99	110	121
EU-Average	**97**	**85**	**82**

Source of raw data: FAO, 2008

Annex 8: Supply of Pulses in the European Union from 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	1	1	1
Belgium	2	3	2
Bulgaria	6	4	4
Cyprus	10	4	4
Czech Republic		2	3
Denmark	0	1	1
Estonia		1	1
Finland	1	2	1
France	2	2	2
Germany	1	1	1
Greece	8	5	5
Hungary	2	2	3
Ireland	2	2	3
Italy	5	5	6
Latvia		0	0
Lithuania		0	5
Malta	12	5	4
Netherlands	2	5	2
Poland	1	2	2
Portugal	7	5	4
Romania	6	1	2
Slovakia		4	3
Slovenia		2	1
Spain	10	6	6
Sweden	1	1	2
United Kingdom	3	6	4
EU-Average	**4**	**3**	**3**

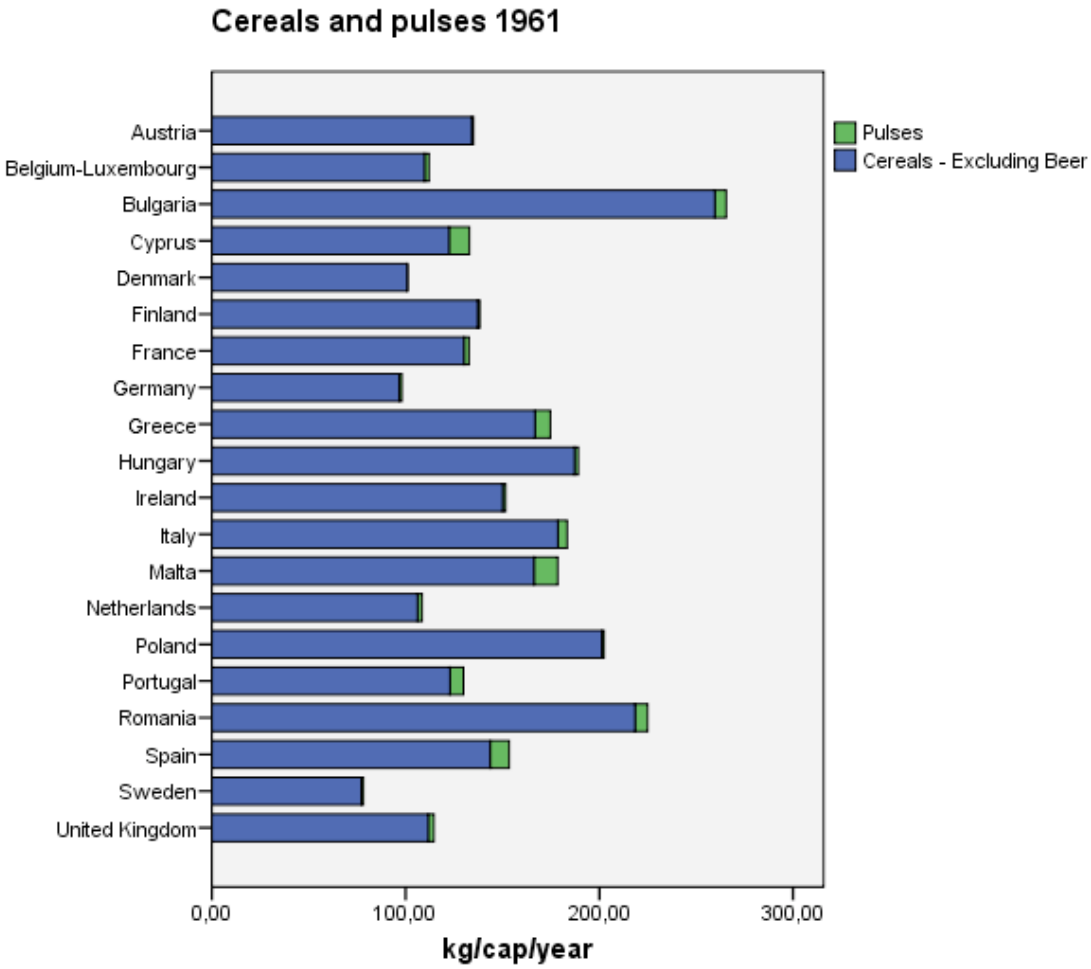
Source of raw data: FAO, 2008

Annex 9: Cereal Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	134	89	111
Belgium	110	103	108
Bulgaria	260	162	154
Cyprus	122	113	98
Czech Republic		109	129
Denmark	101	102	139
Estonia		111	126
Finland	137	90	107
France	130	110	117
Germany	97	93	113
Greece	167	148	153
Hungary	187	127	125
Ireland	150	133	125
Italy	179	152	163
Latvia		147	117
Lithuania		156	155
Malta	166	146	181
Netherlands	106	74	103
Poland	201	158	155
Portugal	123	126	133
Romania	218	202	205
Slovakia		107	124
Slovenia		138	140
Spain	144	102	99
Sweden	77	100	104
United Kingdom	112	93	116
EU-Average	**146**	**123**	**131**

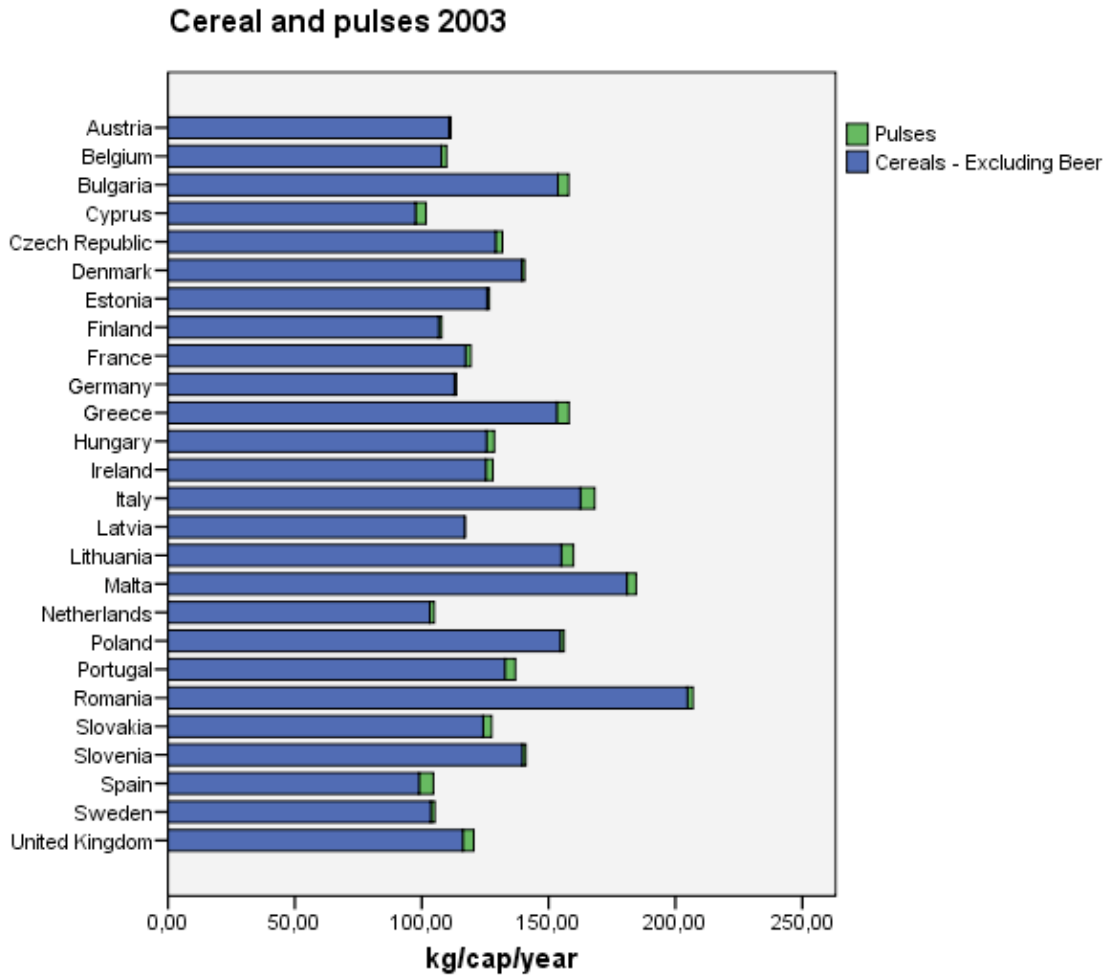
Source of raw data: FAO, 2008

Annex 10: Proportions of Cereals and Pulses 1961



Source of raw data: FAO, 2008

Annex 11: Proportions of Cereals and Pulses 2003



Source of raw data: FAO, 2008

Annex 12: Milk Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	219	269	300
Belgium	181	203	256
Bulgaria	111	166	150
Cyprus	65	169	181
Czech Republic		217	193
Denmark	225	190	239
Estonia		303	211
Finland	358	316	356
France	220	271	275
Germany	172	221	256
Greece	101	249	262
Hungary	121	172	169
Ireland	283	266	329
Italy	145	241	252
Latvia		268	208
Lithuania		137	207
Malta	145	171	215
Netherlands	284	308	329
Poland	207	207	173
Portugal	61	156	215
Romania	109	177	224
Slovakia		166	102
Slovenia		189	240
Spain	83	163	174
Sweden	299	369	378
United Kingdom	232	219	242
EU-Average	**181**	**222**	**236**

Source of raw data: FAO, 2008

Annex 13: Egg Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	13	13	13
Belgium	15	13	12
Bulgaria	6	10	11
Cyprus	5	9	13
Czech Republic		13	14
Denmark	10	15	17
Estonia		13	11
Finland	7	10	8
France	11	15	15
Germany	13	12	12
Greece	6	11	9
Hungary	9	21	17
Ireland	14	8	7
Italy	9	12	11
Latvia		7	12
Lithuania		8	12
Malta	8	17	13
Netherlands	13	13	16
Poland	8	9	12
Portugal	3	9	10
Romania	6	10	13
Slovakia		16	12
Slovenia		7	7
Spain	8	13	13
Sweden	11	12	11
United Kingdom	15	10	12
EU-Average	**10**	**12**	**12**

Source of raw data: FAO, 2008

Annex 14: Supply of Sugar and Sweeteners in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	41	42	46
Belgium	28	45	55
Bulgaria	20	32	30
Cyprus	22	43	48
Czech Republic		41	52
Denmark	51	52	58
Estonia		21	61
Finland	45	44	34
France	31	37	41
Germany	35	43	45
Greece	15	31	35
Hungary	30	48	45
Ireland	53	49	43
Italy	25	30	32
Latvia		40	35
Lithuania		30	39
Malta	40	51	49
Netherlands	47	54	53
Poland	33	45	46
Portugal	19	32	34
Romania	11	26	27
Slovakia		34	32
Slovenia		20	15
Spain	21	28	34
Sweden	46	46	47
United Kingdom	53	36	42
EU-Average	**33**	**39**	**41**

Source of raw data: FAO, 2008

Annex 15: Supply of Oilcrops in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	1	3	4
Belgium	1	3	4
Bulgaria	0	3	3
Cyprus	13	10	9
Czech Republic		2	5
Denmark	2	1	2
Estonia		0	1
Finland	0	1	2
France	1	3	3
Germany	1	3	3
Greece	6	14	15
Hungary	1	1	2
Ireland	1	2	2
Italy	1	3	3
Latvia		0	2
Lithuania		0	1
Malta	2	5	6
Netherlands	1	6	3
Poland	0	1	2
Portugal	3	3	3
Romania	1	1	2
Slovakia		2	3
Slovenia		1	1
Spain	1	4	6
Sweden	2	2	3
United Kingdom	2	4	4
EU-Average	**2**	**3**	**4**

Source of raw data: FAO, 2008

Annex 16: Supply of Vegetable Oils in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	8	18	18
Belgium	13	20	23
Bulgaria	11	13	14
Cyprus	14	17	15
Czech Republic		15	15
Denmark	12	9	8
Estonia		4	8
Finland	3	10	11
France	8	17	18
Germany	10	16	17
Greece	17	26	25
Hungary	1	13	16
Ireland	3	15	16
Italy	13	24	27
Latvia		3	13
Lithuania		5	12
Malta	8	11	7
Netherlands	17	18	17
Poland	3	10	12
Portugal	9	19	18
Romania	5	8	13
Slovakia		9	12
Slovenia		12	9
Spain	13	27	28
Sweden	13	17	14
United Kingdom	9	17	15
EU-Average	**10**	**14**	**15**

Source of raw data: FAO, 2008

Annex 17: Supply of Animal Fats in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	22	21	18
Belgium	20	25	26
Bulgaria	4	6	4
Cyprus	1	3	3
Czech Republic		11	10
Denmark	31	27	26
Estonia		10	8
Finland	22	14	11
France	10	17	18
Germany	19	21	22
Greece	2	3	4
Hungary	23	25	28
Ireland	18	14	10
Italy	3	10	11
Latvia		16	16
Lithuania		14	11
Malta	9	9	9
Netherlands	13	8	9
Poland	21	16	15
Portugal	3	10	14
Romania	4	7	4
Slovakia		15	17
Slovenia		14	16
Spain	1	4	5
Sweden	19	18	19
United Kingdom	19	10	7
EU-Average	**13**	**13**	**13**

Source of raw data: FAO, 2008

Annex 18: Supply of Bovine Meat in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	18	23	19
Belgium	24	21	19
Bulgaria	7	16	10
Cyprus	11	10	7
Czech Republic		21	9
Denmark	17	21	29
Estonia		26	11
Finland	18	19	18
France	29	26	26
Germany	20	18	12
Greece	5	20	19
Hungary	10	7	6
Ireland	16	20	24
Italy	15	27	25
Latvia		32	10
Lithuania		40	13
Malta	17	32	22
Netherlands	19	19	21
Poland	9	13	7
Portugal	6	17	18
Romania	8	10	8
Slovakia		17	9
Slovenia		26	24
Spain	6	13	16
Sweden	20	17	24
United Kingdom	25	17	21
EU-Average	**15**	**20**	**16**

Source of raw data: FAO, 2008

Annex 19: Pork Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	41	66	74
Belgium	25	53	36
Bulgaria	14	30	35
Cyprus	4	41	46
Czech Republic		58	43
Denmark	36	65	63
Estonia		20	30
Finland	14	29	33
France	26	36	38
Germany	38	54	54
Greece	4	21	28
Hungary	47	57	52
Ireland	24	33	44
Italy	8	34	44
Latvia		26	25
Lithuania		8	33
Malta	10	29	32
Netherlands	22	58	36
Poland	34	50	50
Portugal	9	34	42
Romania	14	29	28
Slovakia		47	32
Slovenia		41	39
Spain	8	53	67
Sweden	25	33	37
United Kingdom	26	25	26
EU-Average	**21**	**40**	**41**

Source of raw data: FAO, 2008

Annex 20: Supply of Mutton and Goat Meat in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	0	1	1
Belgium	1	2	2
Bulgaria	6	6	5
Cyprus	7	11	16
Czech Republic		1	0
Denmark	0	1	1
Estonia		1	0
Finland	0	0	0
France	2	4	3
Germany	1	1	1
Greece	9	15	12
Hungary	1	0	0
Ireland	11	10	5
Italy	1	2	1
Latvia		1	0
Lithuania		0	0
Malta	2	2	3
Netherlands	0	1	1
Poland	1	0	0
Portugal	2	4	3
Romania	3	4	3
Slovakia		0	0
Slovenia		0	1
Spain	4	6	6
Sweden	0	1	1
United Kingdom	12	7	6
EU-Average	**3**	**3**	**3**

Source of raw data: FAO, 2008

Annex 21: Red Meat Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	60	90	94
Belgium	49	76	56
Bulgaria	28	52	50
Cyprus	22	62	69
Czech Republic		80	52
Denmark	53	86	93
Estonia		46	41
Finland	32	49	52
France	57	67	68
Germany	58	73	67
Greece	19	56	59
Hungary	58	63	58
Ireland	50	62	73
Italy	23	63	70
Latvia		60	35
Lithuania		48	46
Malta	28	63	56
Netherlands	41	78	58
Poland	44	64	57
Portugal	18	54	63
Romania	25	42	39
Slovakia		64	41
Slovenia		67	64
Spain	18	73	88
Sweden	45	51	62
United Kingdom	63	49	53
EU-Average	**39**	**63**	**60**

Source of raw data: FAO, 2008

Annex 22: Poultry Meat Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	4	15	17
Belgium	7	17	22
Bulgaria	4	10	19
Cyprus	4	29	37
Czech Republic		12	23
Denmark	7	13	18
Estonia		4	21
Finland	1	7	15
France	11	21	25
Germany	5	11	14
Greece	1	15	19
Hungary	9	22	30
Ireland	5	24	28
Italy	5	19	16
Latvia		5	16
Lithuania		6	15
Malta	3	10	23
Netherlands	2	19	9
Poland	2	9	19
Portugal	2	19	22
Romania	3	14	19
Slovakia		12	26
Slovenia		19	29
Spain	3	23	30
Sweden	3	8	13
United Kingdom	6	24	30
EU-Average	**4**	**15**	**21**

Source of raw data: FAO, 2008

Annex 23: Supply of Fish and Seafood in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	9	12	15
Belgium	18	19	
Bulgaria	3	2	3
Cyprus	7	21	28
Czech Republic		8	14
Denmark	17	25	24
Estonia		33	21
Finland	18	34	33
France	18	29	31
Germany	10	14	15
Greece	19	23	23
Hungary	2	4	5
Ireland	8	19	18
Italy	15	23	26
Latvia		31	11
Lithuania		25	60
Malta	13	25	50
Netherlands	11	14	24
Poland	7	11	13
Portugal	56	59	59
Romania	3	1	3
Slovakia		6	7
Slovenia		6	8
Spain	26	39	47
Sweden	26	30	34
United Kingdom	20	21	23
EU-Average	**15**	**21**	**24**

Source of raw data: FAO, 2008

Annex 24: Beer Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	81	115	117
Belgium	116	114	102
Bulgaria	16	50	39
Cyprus	8	45	44
Czech Republic		149	158
Denmark	75	120	94
Estonia		29	76
Finland	22	89	89
France	37	34	30
Germany	92	131	110
Greece	5	37	33
Hungary	39	83	74
Ireland	58	140	190
Italy	7	22	27
Latvia		20	47
Lithuania		34	79
Malta	11	56	38
Netherlands	27	87	80
Poland	23	33	74
Portugal	5	62	60
Romania	11	43	59
Slovakia		81	90
Slovenia		85	65
Spain	13	65	67
Sweden	28	62	56
United Kingdom	90	103	104
EU-Average	**38**	**73**	**77**

Source of raw data: FAO, 2008

Annex 25: Wine Supply in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	24	32	30
Belgium	9	24	27
Bulgaria	22	13	4
Cyprus	12	11	21
Czech Republic		6	12
Denmark	3	23	33
Estonia		2	7
Finland	1	6	10
France	119	64	54
Germany	9	24	23
Greece	34	19	27
Hungary	27	32	34
Ireland	1	4	14
Italy	108	58	51
Latvia		1	8
Lithuania		3	7
Malta	1	7	3
Netherlands	2	12	18
Poland	0	1	2
Portugal	65	58	53
Romania	22	26	23
Slovakia		2	8
Slovenia		48	13
Spain	59	40	37
Sweden	4	12	17
United Kingdom	2	12	18
EU-Average	**26**	**21**	**21**

Source of raw data: FAO, 2008

Annex 26: Supply of Alcoholic Beverages in the European Union in 1961, 1993, 2003 in Numbers

Country	1961 [kg/capita/year]	1993 [kg/capita/year]	2003 [kg/capita/year]
Austria	110	153	155
Belgium	127	141	131
Bulgaria	46	75	54
Cyprus	22	60	69
Czech Republic		161	176
Denmark	81	146	132
Estonia		43	97
Finland	27	101	105
France	177	115	94
Germany	105	160	139
Greece	40	61	64
Hungary	69	121	114
Ireland	62	154	212
Italy	116	81	79
Latvia		25	66
Lithuania		39	96
Malta	13	66	45
Netherlands	31	102	103
Poland	33	48	88
Portugal	82	131	124
Romania	36	74	85
Slovakia		91	103
Slovenia		138	82
Spain	75	108	106
Sweden	38	77	77
United Kingdom	94	118	124
EU-Average	**69**	**100**	**105**

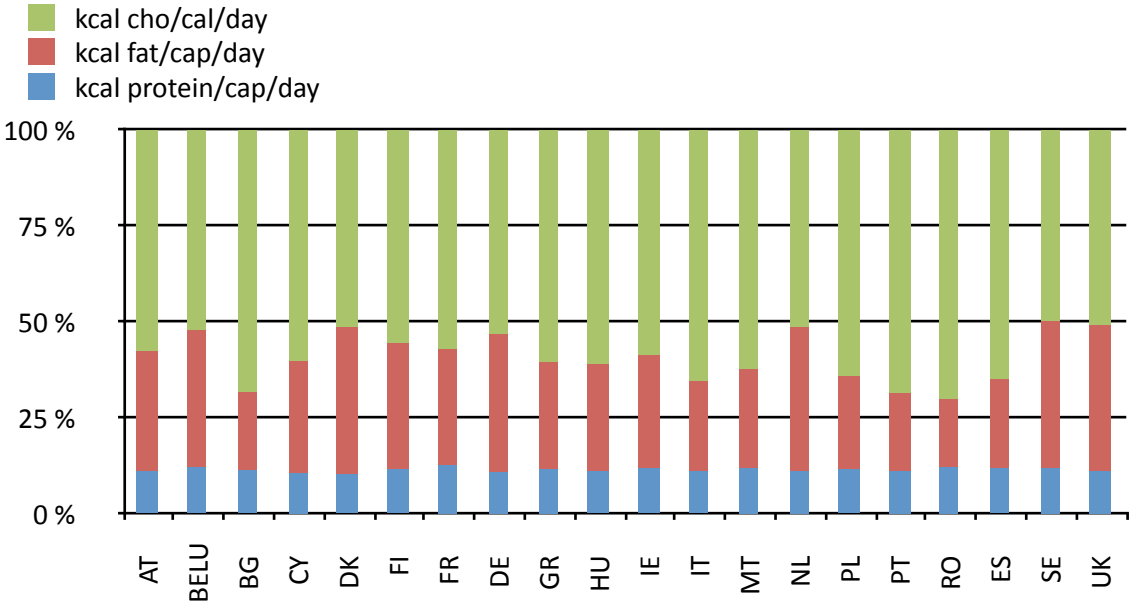
Source of raw data: FAO, 2008

Annex 27: Proportions of Macronutrients in the Daily Diet 1961

	kcal protein/cap/day	kcal fat/cap/day	kcal cho/cap/day	kcal total
AT	355	1.003	1.832	3.190
BELU	359	1.053	1.530	2.942
BG	366	653	2.171	3.190
CY	267	716	1.489	2.472
DK	330	1.227	1.631	3.187
FI	382	1.071	1.812	3.265
FR	412	962	1.821	3.195
DE	319	1.035	1.534	2.888
GR	335	785	1.703	2.823
HU	347	861	1.875	3.083
IE	404	988	1.960	3.353
IT	325	685	1.904	2.914
MT	350	737	1.798	2.885
NL	346	1.143	1.568	3.057
PL	387	795	2.099	3.282
PT	279	501	1.692	2.473
RO	354	504	1.995	2.853
ES	316	611	1.704	2.632
SE	345	1.083	1.408	2.836
UK	372	1.246	1.672	3.290

Source of raw data: FAO, 2008

Annex 28: Proportions of Macronutrients in the Daily Diet 1961



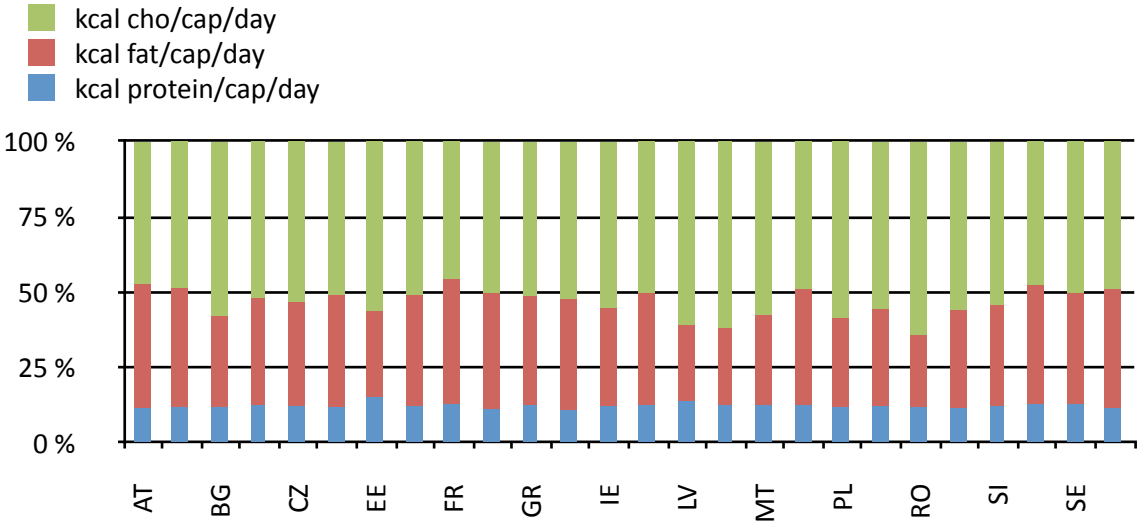
Source of raw data: FAO, 2008

Annex 29: Proportions of Macronutrients in the Daily Diet 1993

	kcal protein/cap/day	kcal fat/cap/day	kcal cho/cap/day	kcal total
AT	407	1.427	1.651	3.485
BELU	426	1.425	1.738	3.589
BG	352	896	1.720	2.967
CY	396	1.142	1.651	3.189
CZ	375	1.043	1.628	3.046
DK	397	1.221	1.685	3.303
EE	392	739	1.449	2.580
FI	367	1.128	1.543	3.037
FR	454	1.474	1.610	3.538
DE	368	1.274	1.665	3.307
GR	449	1.280	1.827	3.556
HU	366	1.260	1.789	3.415
IE	440	1.174	1.998	3.613
IT	430	1.297	1.738	3.465
LV	408	755	1.804	2.966
LT	353	721	1.735	2.809
MT	405	977	1.874	3.256
NL	417	1.269	1.614	3.299
PL	404	1.016	1.999	3.419
PT	431	1.126	1.949	3.506
RO	386	768	2.073	3.227
SK	325	929	1.579	2.833
SI	357	981	1.592	2.930
ES	423	1.293	1.557	3.274
SE	401	1.162	1.575	3.138
UK	376	1.280	1.583	3.239

Source of raw data: FAO, 2008

Annex 30: Proportions of Macronutrients in the Daily Diet 1993



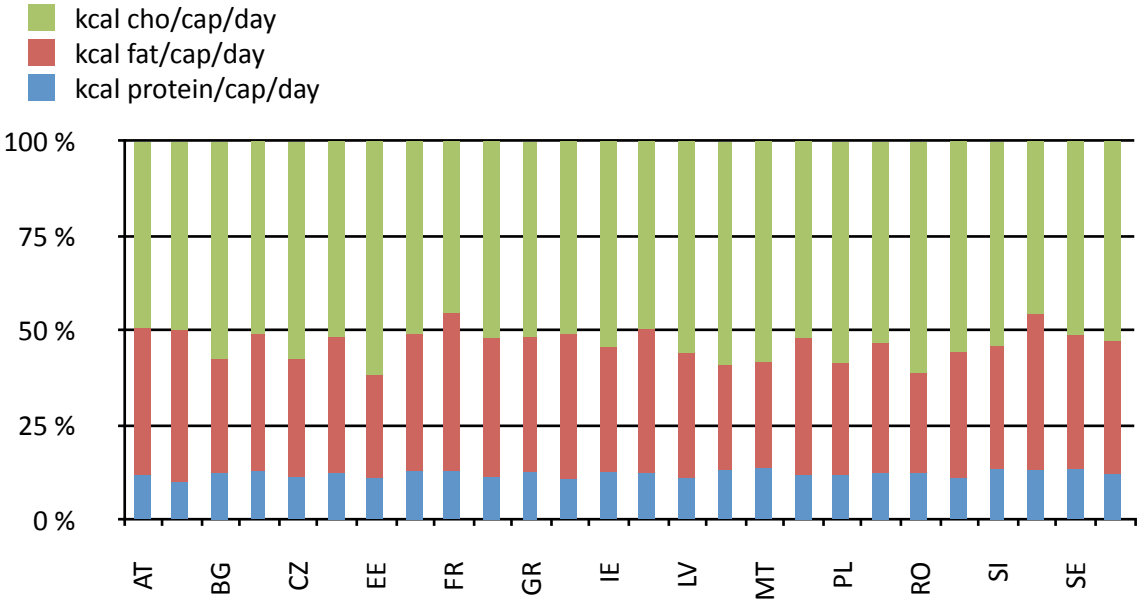
Source of raw data: FAO, 2008

Annex 31: Proportions of Macronutrients in the Daily Diet 2003

	kcal protein/cap/day	kcal fat/cap/day	kcal cho/cap/day	kcal total
AT	441	1.449	1.842	3.732
BE	362	1.463	1.808	3.634
BG	361	868	1.657	2.885
CY	419	1.179	1.648	3.246
CZ	378	1.030	1.900	3.308
DK	436	1.247	1.790	3.472
EE	356	881	1.985	3.222
FI	411	1.138	1.595	3.143
FR	469	1.515	1.640	3.623
DE	401	1.277	1.806	3.484
GR	469	1.304	1.893	3.666
HU	382	1.365	1.804	3.552
IE	469	1.233	2.015	3.717
IT	454	1.405	1.816	3.675
LV	335	996	1.683	3.014
LT	446	942	1.984	3.372
MT	485	988	2.048	3.521
NL	420	1.257	1.818	3.495
PL	399	1.003	1.964	3.366
PT	468	1.281	1.997	3.747
RO	451	941	2.191	3.582
SK	306	930	1.542	2.779
SI	403	956	1.596	2.954
ES	455	1.410	1.557	3.421
SE	433	1.139	1.636	3.208
UK	422	1.212	1.816	3.450

Source of raw data: FAO, 2008

Annex 32: Proportions of Macronutrients in the Daily Diet 2003



Source of raw data: FAO, 2008

Annex 33: Consumer Similarity Index 1963 (Mean 0,80)

	AT	BELU	BG	CY	DE	DK	ES	FI	FR	GR	HU	IE	IT	MT	NL	PL	PT	RO	SE	UK
AT	1,0	0,89	0,7	0,75	**0,92**	0,88	0,75	0,89	**0,9**	0,71	0,84	**0,91**	0,78	0,83	0,87	0,86	0,77	0,67	0,84	0,89
BELU	0,89	1,0	0,71	0,76	**0,93**	**0,91**	0,79	0,83	0,89	0,72	0,83	0,84	0,8	0,8	0,89	0,83	0,78	0,67	0,86	0,87
BG	0,7	0,71	1,0	0,79	0,69	0,64	0,82	0,65	0,72	0,84	0,77	0,66	0,88	0,81	0,66	0,77	0,86	**0,92**	0,61	0,63
CY	0,75	0,76	0,79	1,0	0,73	0,68	**0,9**	0,68	0,76	0,89	0,76	0,69	0,89	0,82	0,75	0,77	0,88	0,73	0,67	0,66
DE	**0,92**	**0,93**	0,69	0,73	1,0	0,92	0,75	0,84	0,87	0,69	0,82	0,86	0,77	0,79	0,88	0,81	0,76	0,64	0,87	**0,91**
DK	0,88	**0,91**	0,64	0,68	**0,92**	1,0	0,71	0,84	0,84	0,64	0,78	0,87	0,72	0,79	0,89	0,79	0,71	0,61	0,89	**0,91**
ES	0,75	0,79	0,82	0,9	0,75	0,71	1,0	0,71	0,79	0,89	0,79	0,71	**0,92**	0,86	0,76	0,8	**0,92**	0,78	0,71	0,69
FI	0,89	0,83	0,65	0,68	0,84	0,84	0,71	1,0	0,83	0,65	0,82	**0,94**	0,72	0,8	0,83	0,86	0,71	0,65	0,84	0,84
FR	**0,9**	0,89	0,72	0,76	0,87	0,84	0,79	0,83	1,0	0,72	0,82	0,86	0,8	0,83	0,86	0,85	0,79	0,71	0,8	0,88
GR	0,71	0,72	0,84	0,89	0,69	0,64	0,89	0,65	0,72	1,0	0,75	0,65	**0,91**	0,82	0,72	0,77	0,88	0,81	0,64	0,62
HU	0,84	0,83	0,77	0,76	0,82	0,78	0,79	0,82	0,82	0,75	1,0	0,83	0,83	0,84	0,74	**0,92**	0,81	0,75	0,71	0,77
IE	**0,91**	0,84	0,66	0,69	0,86	0,87	0,71	**0,94**	0,86	0,65	0,83	1,0	0,73	0,81	0,87	0,87	0,71	0,66	0,87	0,88
IT	0,78	0,8	0,88	0,89	0,77	0,72	**0,92**	0,72	0,8	**0,91**	0,83	0,73	1,0	0,88	0,76	0,84	**0,93**	0,82	0,7	0,7
MT	0,83	0,8	0,81	0,82	0,79	0,79	0,86	0,8	0,83	0,82	0,84	0,81	0,88	1,0	0,81	0,89	0,86	0,79	0,75	0,79
NL	0,87	0,89	0,66	0,75	0,88	0,89	0,76	0,83	0,86	0,72	0,74	0,87	0,76	0,81	1,0	0,79	0,73	0,62	**0,92**	0,88
PL	0,86	0,83	0,77	0,77	0,81	0,79	0,8	0,86	0,85	0,77	**0,92**	0,87	0,84	0,89	0,79	1,0	0,82	0,78	0,75	0,79
PT	0,77	0,78	0,86	0,88	0,76	0,71	**0,92**	0,71	0,79	0,88	0,81	0,71	**0,93**	0,86	0,73	0,82	1,0	0,8	0,69	0,69
RO	0,67	0,67	**0,92**	0,73	0,64	0,61	0,78	0,65	0,71	0,81	0,75	0,66	0,82	0,79	0,62	0,78	0,8	1,0	0,57	0,6
SE	0,84	0,86	0,61	0,67	0,87	0,89	0,71	0,84	0,8	0,64	0,71	0,87	0,7	0,75	**0,92**	0,75	0,69	0,57	1,0	0,89
UK	0,89	0,87	0,63	0,66	**0,91**	**0,91**	0,69	0,84	0,88	0,62	0,77	0,88	0,7	0,79	0,88	0,79	0,69	0,6	0,89	1,0

Source of raw data: FAO, 2008; own calculations

Annex 34: Consumer Similarity Index 1973 (Mean 0,83)

	AT	**BELU**	**BG**	**CY**	**DK**	**FI**	**FR**	**DE**	**GR**	**HU**	**IE**	**IT**	**MT**	**NL**	**PL**	**PT**	**RO**	**ES**	**SE**	**UK**
AT	1,0	**0,92**	0,77	0,83	0,88	0,89	**0,91**	**0,95**	0,78	0,84	**0,9**	0,81	0,81	**0,9**	0,88	0,77	0,74	0,83	0,88	0,92
BELU	**0,92**	1,0	0,76	0,81	**0,92**	0,84	0,88	**0,92**	0,77	0,85	0,85	0,81	0,78	0,87	0,84	0,79	0,75	0,83	0,86	0,88
BG	0,77	0,76	1,0	0,79	0,71	0,67	0,73	0,76	0,83	0,79	0,72	**0,9**	0,83	0,72	0,79	0,88	**0,93**	0,81	0,71	0,71
CY	0,83	0,81	0,79	1,0	0,73	0,72	0,8	0,8	**0,91**	0,77	0,78	0,88	0,79	0,83	0,8	0,85	0,75	**0,92**	0,79	0,77
DK	0,88	**0,92**	0,71	0,73	1,0	0,85	0,85	**0,91**	0,71	0,81	0,84	0,75	0,79	0,87	0,8	0,74	0,71	0,77	0,88	0,88
FI	0,89	0,84	0,67	0,72	0,85	1,0	0,89	0,88	0,68	0,8	**0,94**	0,71	0,78	0,86	0,86	0,69	0,69	0,73	0,87	0,92
FR	**0,91**	0,88	0,73	0,8	0,85	0,89	1,0	**0,91**	0,75	0,81	0,88	0,78	0,82	**0,91**	0,86	0,76	0,75	0,8	0,88	0,95
DE	**0,95**	**0,92**	0,76	0,8	**0,91**	0,88	**0,91**	1,0	0,75	0,84	0,87	0,8	0,79	0,89	0,85	0,76	0,74	0,81	0,87	0,93
GR	0,78	0,77	0,83	**0,91**	0,71	0,68	0,75	0,75	1,0	0,75	0,72	**0,91**	0,82	0,78	0,79	0,89	0,81	**0,91**	0,76	0,72
HU	0,84	0,85	0,79	0,77	0,81	0,8	0,81	0,84	0,75	1,0	0,83	0,82	0,83	0,76	**0,9**	0,8	0,78	0,75	0,73	0,81
IE	**0,9**	0,85	0,72	0,78	0,84	**0,94**	0,88	0,87	0,72	0,83	1,0	0,76	0,83	0,88	**0,9**	0,73	0,74	0,77	0,88	0,91
IT	0,81	0,81	**0,9**	0,88	0,75	0,71	0,78	0,8	**0,91**	0,82	0,76	1,0	0,86	0,81	0,83	**0,93**	0,86	**0,9**	0,8	0,75
MT	0,81	0,78	0,83	0,79	0,79	0,78	0,82	0,79	0,82	0,83	0,83	0,86	1,0	0,8	0,86	0,85	0,85	0,81	0,79	0,81
NL	**0,9**	0,87	0,72	0,83	0,87	0,86	**0,91**	0,89	0,78	0,76	0,88	0,81	0,8	1,0	0,82	0,77	0,71	0,83	**0,95**	0,91
PL	0,88	0,84	0,79	0,8	0,8	0,86	0,86	0,85	0,79	0,9	0,9	0,83	0,86	0,82	1,0	0,8	0,81	0,78	0,81	0,86
PT	0,77	0,79	0,88	0,85	0,74	0,69	0,76	0,76	0,89	0,8	0,73	**0,93**	0,85	0,77	0,8	1,0	0,85	0,88	0,77	0,72
RO	0,74	0,75	**0,93**	0,75	0,71	0,69	0,75	0,74	0,81	0,78	0,74	0,86	0,85	0,71	0,81	0,85	1,0	0,78	0,7	0,72
ES	0,83	0,83	0,81	**0,92**	0,77	0,73	0,8	0,81	**0,91**	0,75	0,77	**0,9**	0,81	0,83	0,78	0,88	0,78	1,0	0,82	0,77
SE	0,88	0,86	0,71	0,79	0,88	0,87	0,88	0,87	0,76	0,73	0,88	0,8	0,79	**0,95**	0,81	0,77	0,7	0,82	1,0	0,88
UK	**0,92**	0,88	0,71	0,77	0,88	**0,92**	**0,95**	**0,93**	0,72	0,81	0,91	0,75	0,81	**0,91**	0,86	0,72	0,72	0,77	0,88	1,0

Source of raw data: FAO, 2008; own calculations

Annex 35: Consumer Similarity Index 1983 (Mean 0,85)

	AT	BELU	BG	CY	DK	FI	FR	DE	GR	HU	IE	IT	MT	NL	PL	PT	RO	ES	SE	UK
AT	1,0	**0,93**	0,79	0,8	**0,91**	0,88	**0,91**	**0,94**	0,8	0,85	0,89	0,83	0,81	**0,93**	0,84	0,78	0,77	0,83	**0,91**	**0,93**
BELU	**0,93**	1,0	0,83	0,82	**0,94**	0,85	**0,91**	**0,93**	0,82	0,88	0,88	0,85	0,83	0,88	0,85	0,82	0,81	0,85	0,89	**0,91**
BG	0,79	0,83	1,0	0,83	0,8	0,76	0,83	0,82	0,85	0,82	0,83	0,89	0,88	0,79	0,84	0,89	**0,95**	0,81	0,78	0,79
CY	0,8	0,82	0,83	1,0	0,78	0,74	0,82	0,79	0,89	0,77	0,81	0,88	0,8	0,81	0,77	0,85	0,81	0,87	0,78	0,77
DK	**0,91**	**0,94**	0,8	0,78	1,0	0,86	0,89	**0,94**	0,77	0,86	0,88	0,81	0,86	0,89	0,87	0,79	0,79	0,81	**0,92**	**0,93**
FI	0,88	0,85	0,76	0,74	0,86	1,0	**0,9**	**0,9**	0,74	0,85	**0,91**	0,77	0,78	0,87	0,85	0,74	0,74	0,78	0,89	**0,9**
FR	**0,91**	**0,91**	0,83	0,82	0,89	**0,9**	1,0	**0,92**	0,83	0,85	**0,9**	0,86	0,85	**0,91**	0,84	0,83	0,82	0,86	0,89	**0,93**
DE	**0,94**	**0,93**	0,82	0,79	**0,94**	**0,9**	**0,92**	1,0	0,79	0,89	**0,91**	0,83	0,84	**0,91**	0,86	0,79	0,8	0,82	0,89	**0,95**
GR	0,8	0,82	0,85	0,89	0,77	0,74	0,83	0,79	1,0	0,78	0,81	**0,94**	0,85	0,81	0,8	**0,9**	0,87	**0,93**	0,79	0,77
HU	0,85	0,88	0,82	0,77	0,86	0,85	0,85	0,89	0,78	1,0	**0,91**	0,82	0,83	0,8	0,89	0,81	0,81	0,76	0,79	0,87
IE	0,89	0,88	0,83	0,81	0,88	**0,91**	**0,9**	**0,91**	0,81	**0,91**	1,0	0,84	0,85	0,88	**0,92**	0,81	0,81	0,8	0,87	**0,91**
IT	0,83	0,85	0,89	0,88	0,81	0,77	0,86	0,83	**0,94**	0,82	0,84	1,0	0,86	0,83	0,84	**0,93**	0,89	0,9	0,81	0,8
MT	0,81	0,83	0,88	0,8	0,86	0,78	0,85	0,84	0,85	0,83	0,85	0,86	1,0	0,84	**0,9**	0,87	0,89	0,81	0,84	0,84
NL	**0,93**	0,88	0,79	0,81	0,89	0,87	**0,91**	**0,91**	0,81	0,8	0,88	0,83	0,84	1,0	0,82	0,79	0,77	0,84	**0,93**	**0,92**
PL	0,84	0,85	0,84	0,77	0,87	0,85	0,84	0,86	0,8	0,89	**0,92**	0,84	**0,9**	0,82	1,0	0,82	0,83	0,76	0,84	0,87
PT	0,78	0,82	0,89	0,85	0,79	0,74	0,83	0,79	**0,9**	0,81	0,81	**0,93**	0,87	0,79	0,82	1,0	**0,9**	0,86	0,79	0,77
RO	0,77	0,81	**0,95**	0,81	0,79	0,74	0,82	0,8	0,87	0,81	0,81	0,89	0,89	0,77	0,83	**0,9**	1,0	0,82	0,77	0,78
ES	0,83	0,85	0,81	0,87	0,81	0,78	0,86	0,82	**0,93**	0,76	0,8	**0,9**	0,81	0,84	0,76	0,86	0,82	1,0	0,83	0,8
SE	**0,91**	0,89	0,78	0,78	**0,92**	0,89	0,89	0,89	0,79	0,79	0,87	0,81	0,84	**0,93**	0,84	0,79	0,77	0,83	1,0	0,89
UK	**0,93**	**0,91**	0,79	0,77	**0,93**	**0,9**	**0,93**	**0,95**	0,77	0,87	**0,91**	0,8	0,84	**0,92**	0,87	0,77	0,78	0,8	0,89	1,0

Source of raw data: FAO, 2008; own calculations

Annex 36: Consumer Similarity Index 1993 (Mean 0,86)

	AT	BELU	BG	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
AT	1,0	**0,93**	0,81	0,86	**0,93**	0,87	0,77	0,87	**0,92**	**0,95**	0,82	0,86	0,87	0,84	0,78	0,77	0,82	**0,9**	0,83	0,85	0,72	0,88	0,83	0,85	0,89	**0,93**
BELU	**0,93**	1,0	0,83	0,87	**0,91**	**0,9**	0,76	0,85	**0,9**	**0,95**	0,82	**0,9**	0,88	0,85	0,77	0,78	0,85	0,87	0,84	0,88	0,74	0,89	0,83	0,85	**0,9**	**0,91**
BG	0,81	0,83	1,0	0,85	0,79	0,79	0,83	0,8	0,84	0,84	0,83	0,84	0,89	0,88	0,86	0,89	0,89	0,79	**0,91**	0,88	0,89	0,88	**0,91**	0,8	0,82	0,85
CY	0,86	0,87	0,85	1,0	**0,91**	0,82	0,78	0,84	0,88	0,87	0,89	0,87	**0,92**	0,88	0,8	0,77	0,88	0,87	0,85	0,89	0,77	0,87	0,84	0,87	0,88	**0,9**
CZ	**0,93**	**0,91**	0,86	**0,91**	1,0	0,89	0,82	**0,92**	**0,94**	**0,94**	0,84	0,89	**0,94**	0,86	0,84	0,81	0,87	**0,9**	0,89	0,88	0,77	**0,9**	0,87	0,86	**0,93**	**0,95**
DK	0,87	**0,9**	0,79	0,82	0,89	1,0	0,8	0,89	0,87	**0,91**	0,74	**0,92**	0,86	0,8	0,83	0,83	0,85	0,82	0,87	0,82	0,75	**0,9**	0,81	0,8	0,88	0,86
EE	0,77	0,76	0,83	0,78	0,82	0,8	1,0	0,85	0,82	0,78	0,77	0,79	0,85	0,82	**0,91**	0,86	0,84	0,75	0,87	0,83	0,81	0,85	0,87	0,75	0,83	0,8
FI	0,87	0,85	0,8	0,84	**0,92**	0,89	0,85	1,0	**0,92**	0,88	0,77	0,85	**0,9**	0,79	0,86	0,8	0,85	0,88	0,86	0,82	0,74	0,86	0,82	0,8	**0,93**	0,89
FR	**0,92**	**0,9**	0,84	0,88	**0,94**	0,87	0,82	**0,92**	1,0	0,92	0,83	0,86	**0,92**	0,85	0,82	0,81	0,84	**0,9**	0,86	0,87	0,76	0,88	0,86	0,86	**0,91**	**0,95**
DE	**0,95**	**0,95**	0,84	0,87	**0,94**	**0,91**	0,78	0,88	**0,92**	1,0	0,8	**0,9**	0,89	0,85	0,81	0,81	0,86	0,89	0,87	0,87	0,74	**0,9**	0,85	0,86	**0,91**	**0,92**
GR	0,82	0,82	0,83	0,89	0,84	0,74	0,77	0,77	0,83	0,8	1,0	0,79	0,85	**0,91**	0,74	0,74	0,84	0,8	0,79	0,89	0,78	0,82	0,82	**0,9**	0,82	0,84
HU	0,86	**0,9**	0,84	0,87	0,89	**0,92**	0,79	0,85	0,86	**0,9**	0,79	1,0	**0,91**	0,84	0,81	0,82	0,88	0,8	0,88	0,87	0,77	**0,93**	0,87	0,79	0,86	0,86
IE	0,87	0,88	0,89	**0,92**	**0,94**	0,86	0,85	**0,9**	**0,92**	0,89	0,85	**0,91**	1,0	0,87	0,86	0,82	0,89	0,88	**0,9**	0,89	0,8	**0,91**	0,89	0,83	**0,91**	0,91
IT	0,84	0,85	0,88	0,88	0,86	0,8	0,82	0,79	0,85	0,85	**0,91**	0,84	0,87	1,0	0,79	0,82	0,88	0,82	0,86	**0,94**	0,8	0,87	0,88	**0,91**	0,83	0,87
LV	0,78	0,77	0,86	0,8	0,84	0,83	**0,91**	0,86	0,82	0,81	0,74	0,81	0,86	0,79	1,0	**0,91**	0,85	0,77	**0,92**	0,8	0,82	0,85	0,87	0,72	0,84	0,81
LT	0,77	0,78	0,89	0,77	0,81	0,83	0,86	0,8	0,81	0,81	0,74	0,82	0,82	0,82	**0,91**	1,0	0,83	0,72	**0,9**	0,82	0,88	0,86	0,87	0,74	0,78	0,79
MT	0,82	0,85	0,89	0,88	0,87	0,85	0,84	0,85	0,84	0,86	0,84	0,88	0,89	0,88	0,85	0,83	1,0	0,84	**0,92**	0,89	0,82	**0,9**	0,87	0,8	0,87	0,85
NL	**0,9**	0,87	0,79	0,87	**0,9**	0,82	0,75	0,88	**0,9**	0,89	0,8	0,8	0,88	0,82	0,77	0,72	0,84	1,0	0,79	0,83	0,7	0,81	0,78	0,83	0,89	**0,91**
PL	0,83	0,84	**0,91**	0,85	0,89	0,87	0,87	0,86	0,86	0,87	0,79	0,88	**0,9**	0,86	**0,92**	0,9	**0,92**	0,79	1,0	0,86	0,85	**0,92**	**0,92**	0,78	0,85	0,85
PT	0,85	0,88	0,88	0,89	0,88	0,82	0,83	0,82	0,87	0,87	0,89	0,87	0,89	**0,94**	0,8	0,82	0,89	0,83	0,86	1,0	0,81	0,89	0,88	0,88	0,87	0,88
RO	0,72	0,74	0,89	0,77	0,77	0,75	0,81	0,74	0,76	0,74	0,78	0,77	0,8	0,8	0,82	0,88	0,82	0,7	0,85	0,81	1,0	0,8	0,86	0,72	0,74	0,75
SK	0,88	0,89	0,88	0,87	**0,9**	**0,9**	0,85	0,86	0,88	**0,9**	0,82	**0,93**	**0,91**	0,87	0,85	0,86	**0,9**	0,81	**0,92**	0,89	0,8	1,0	0,89	0,82	0,86	0,88
SI	0,83	0,83	**0,91**	0,84	0,87	0,81	0,87	0,82	0,86	0,85	0,82	0,87	0,89	0,88	0,87	0,87	0,87	0,78	**0,92**	0,88	0,86	0,89	1,0	0,8	0,83	0,86
ES	0,85	0,85	0,8	0,87	0,86	0,8	0,75	0,8	0,86	0,86	**0,9**	0,79	0,83	**0,91**	0,72	0,74	0,8	0,83	0,78	0,88	0,72	0,82	0,8	1,0	0,83	0,88
SE	0,89	**0,9**	0,82	0,88	**0,93**	0,88	0,83	**0,93**	**0,91**	**0,91**	0,82	0,86	**0,91**	0,83	0,84	0,78	0,87	0,89	0,85	0,87	0,74	0,86	0,83	0,83	1,0	**0,91**
UK	**0,93**	**0,91**	0,85	**0,9**	**0,95**	0,86	0,8	0,89	**0,95**	**0,92**	0,84	0,86	**0,91**	0,87	0,81	0,79	0,85	**0,91**	0,85	0,88	0,75	0,88	0,86	0,88	**0,91**	1,0

Source of raw data: FAO, 2008; own calculations

Annex 37: Consumer Similarity Index 2003 (Mean 0,86)

	AT	BE	BG	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
AT	1,0	0,85	0,83	0,89	0,89	**0,91**	0,83	0,88	**0,95**	**0,96**	0,84	0,89	**0,9**	0,85	0,89	0,83	0,81	**0,92**	0,86	**0,9**	0,76	0,85	0,81	0,86	**0,91**	**0,93**
BE	0,85	1,0	0,77	0,83	0,84	0,83	0,81	0,77	0,86	0,87	0,81	0,86	0,82	0,78	0,85	0,76	0,77	0,86	0,79	0,82	0,74	0,81	0,72	0,8	0,85	0,83
BG	0,83	0,77	1,0	0,84	0,77	0,77	0,82	0,82	0,85	0,85	0,87	0,84	0,86	0,88	0,89	**0,92**	0,89	0,83	0,89	0,88	0,91	0,87	0,87	0,82	0,81	0,87
CY	0,89	0,83	0,84	1,0	0,88	0,86	0,87	0,86	**0,9**	0,89	0,87	0,86	**0,91**	0,83	0,86	0,82	0,84	**0,92**	0,83	0,87	0,79	0,81	0,81	0,87	**0,9**	**0,93**
CZ	0,89	0,84	0,88	0,88	1,0	0,86	**0,9**	0,86	0,88	**0,91**	0,87	**0,91**	0,89	0,87	**0,93**	0,89	0,88	**0,9**	**0,9**	**0,91**	0,82	**0,9**	0,83	0,83	0,89	**0,92**
DK	**0,91**	0,83	0,77	0,86	0,86	1,0	0,86	0,84	0,88	**0,9**	0,76	0,89	0,85	0,8	0,84	0,81	0,83	0,87	0,86	0,86	0,73	0,83	0,78	0,81	0,89	0,87
EE	0,83	0,81	0,82	0,87	**0,9**	0,86	1,0	0,88	0,86	0,86	0,83	0,84	0,89	0,8	0,89	0,85	0,88	0,88	0,85	0,85	0,81	0,82	0,81	0,78	0,88	0,89
FI	0,88	0,77	0,82	0,86	0,86	0,84	0,88	1,0	0,89	0,87	0,83	0,83	**0,93**	0,83	0,89	0,87	0,83	0,88	0,85	0,88	0,81	0,81	0,84	0,82	**0,9**	**0,91**
FR	**0,95**	0,86	0,85	**0,9**	0,88	0,88	0,86	0,89	1,0	**0,92**	0,85	**0,9**	**0,93**	0,85	**0,92**	0,85	0,82	**0,91**	0,86	**0,91**	0,8	0,86	0,82	0,87	**0,92**	**0,94**
DE	**0,96**	0,87	0,85	0,89	**0,91**	**0,9**	0,86	0,87	**0,92**	1,0	0,85	**0,93**	**0,91**	0,86	**0,91**	0,86	0,84	**0,92**	0,88	**0,92**	0,78	0,88	0,82	0,84	**0,93**	**0,93**
GR	0,84	0,81	0,87	0,87	0,87	0,76	0,83	0,83	0,85	0,85	1,0	0,81	0,86	**0,91**	0,89	0,85	0,83	0,85	0,81	0,89	0,83	0,82	0,82	0,86	0,82	0,87
HU	0,89	0,86	0,84	0,86	**0,91**	0,89	0,84	0,83	**0,9**	**0,93**	0,81	1,0	0,87	0,83	**0,9**	0,84	0,82	0,86	0,88	**0,9**	0,78	**0,91**	0,79	0,81	0,87	**0,9**
IE	**0,9**	0,82	0,86	**0,91**	0,89	0,85	0,89	**0,93**	0,93	**0,91**	0,86	0,87	1,0	0,86	**0,91**	0,86	0,83	**0,92**	0,86	**0,9**	0,82	0,84	0,85	0,85	**0,93**	**0,95**
IT	0,85	0,78	0,88	0,83	0,87	0,8	0,8	0,83	0,85	0,86	**0,91**	0,83	0,86	1,0	0,87	0,89	0,83	0,85	0,87	**0,92**	0,82	0,84	0,85	0,89	0,82	0,88
LV	0,89	0,85	0,89	0,86	**0,93**	0,84	0,89	0,89	**0,92**	**0,91**	0,89	**0,9**	**0,91**	0,87	1,0	**0,9**	0,87	0,89	**0,9**	**0,92**	0,86	**0,9**	0,86	0,81	0,89	**0,91**
LT	0,83	0,76	**0,92**	0,82	0,89	0,81	0,85	0,87	0,85	0,86	0,85	0,84	0,86	0,89	**0,9**	1,0	**0,92**	0,84	**0,93**	**0,9**	0,88	0,89	0,89	0,81	0,85	0,87
MT	0,81	0,77	0,89	0,84	0,88	0,83	0,88	0,83	0,82	0,84	0,83	0,82	0,83	0,83	0,87	**0,92**	1,0	0,83	**0,9**	0,85	0,86	0,86	0,88	0,77	0,84	0,86
NL	**0,92**	0,86	0,83	**0,92**	**0,9**	0,87	0,88	0,88	**0,91**	**0,92**	0,85	0,86	**0,92**	0,85	0,89	0,84	0,83	1,0	0,85	0,89	0,78	0,81	0,82	0,85	**0,94**	**0,92**
PL	0,86	0,79	0,89	0,83	**0,9**	0,86	0,85	0,85	0,86	0,88	0,81	0,88	0,86	0,87	**0,9**	**0,93**	**0,9**	0,85	1,0	0,88	0,84	**0,91**	0,88	0,78	0,87	0,87
PT	**0,9**	0,82	0,88	0,87	**0,91**	0,86	0,85	0,88	**0,91**	**0,92**	0,89	**0,9**	**0,9**	**0,92**	**0,92**	**0,9**	0,85	0,89	0,88	1,0	0,82	0,87	0,85	0,87	0,89	**0,91**
RO	0,76	0,74	**0,91**	0,79	0,82	0,73	0,81	0,81	0,8	0,78	0,83	0,78	0,82	0,82	0,86	0,88	0,86	0,78	0,84	0,82	1,0	0,82	0,87	0,74	0,78	0,81
SK	0,85	0,81	0,87	0,81	**0,9**	0,83	0,82	0,81	0,86	0,88	0,82	**0,91**	0,84	0,84	**0,9**	0,89	0,86	0,81	**0,91**	0,87	0,82	1,0	0,84	0,78	0,83	0,86
SI	0,81	0,72	0,87	0,81	0,83	0,78	0,81	0,84	0,82	0,82	0,82	0,79	0,85	0,85	0,86	0,89	0,88	0,82	0,88	0,85	0,87	0,84	1,0	0,75	0,81	0,85
ES	0,86	0,8	0,82	0,87	0,83	0,81	0,78	0,82	0,87	0,84	0,86	0,81	0,85	0,89	0,81	0,81	0,77	0,85	0,78	0,87	0,74	0,78	0,75	1,0	0,82	0,88

Source of raw data: FAO, 2008; own calculations

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Summary

This study analyses the Food and Agriculture Organisations (FAO) Food Balance Sheet (FBS) data from the member countries of the European Union in 2009 for the years 1961 to 2003. Though the reliability and accuracy of FBS data relies heavily on the underlying basic data, they are still a useful tool to compare long time developments of the food supply in different countries.

The highest increase from 1961 to 2003 was found in the supply of poultry meat with an increase of 320%. While red meats, including bovine meat (+7%), pork (+95%), and mutton and goat meat (stayed stable), increased by 50%.

Fruit (+49%) and vegetables (+45%) increased almost similarly. But with the decrease in the plant foods potatoes (-15%), pulses (-25%) and cereal (-10%); and the increase in the animal foods milk (+33%), eggs (+20%) and fish and seafood (+60%) a vegetal-animal ratio that decreased from 2.74 in 1961 to 2.54 in 2003 is hardly surprising. The vegetal-animal ratio also shows the harmonisation of diets in the European Union which was further analysed with a consumer similarity index.

A critical development is the increase of beer supply by 103%, and even though the wine supply decreased by 19% the overall supply of alcoholic beverages still increased by 50%.

The supply of oilcrops, which is in general low, still increased by 75%, the supply of vegetable oils by 50%; only the average supply of animal fats did not change between 1961 and 2003.

Sugar and Sweeteners increased by 24%.

An analysis of the proportion of macronutrients showed a clear increase in the proportion of fat supply at the expense of carbohydrates. The proportion of protein supply increased only slightly.

To compare the European countries more thoroughly a Consumer Similarity Index (CSI) was calculated. It demonstrates a growing similarity, where geographic proximity is still a vital factor, but even countries far from each other grew closer concerning food supply. The average consumer similarity for 1961 was 80% with a lowest value of 57%. In 2003 the average similarity in the European Union was 86% and the lowest value 72%.

Zusammenfassung

In dieser Studie über die Nahrungsmittelverfügbarkeit in der Europäischen Union mit den Mitgliederstaaten von 2009, werden Food Balance Sheets (FBS) der Food and Agriculture Organisation (FAO) von 1961 bis 2003 analysiert. Obwohl die Zuverlässigkeit und Präzision der FBS Daten stark von der Qualität der zu Grunde liegenden Basisdaten abhängt, bieten die FBS ein gutes Instrument um langzeitliche Veränderungen in der Verfügbarkeitsentwicklung verschiedener Länder darzustellen und zu vergleichen.

Der größte Anstieg wurde bei Geflügelfleisch festgestellt (+320%). Rotes Fleisch, das Rindfleisch (+7%), Schweinefleisch (+95%) und Schaffleisch (keine Veränderung) beinhaltet, stieg insgesamt um 50%. Früchte (+49%) und Gemüse (+45%) verzeichnen einen ähnlichen Anstieg. Jedoch sank die Verfügbarkeit von Kartoffeln (-15%), Hülsenfrüchten (-25%), Getreide (-10%); mit dem Anstieg von Milch (+33%), Eiern (+20%) und Fisch/Meeresfrüchten (+60%) war eine Senkung des berechneten Verhältnisses von pflanzlichen zu tierischen Produkten von 2.74 in 1961 zu 2.54 in 2003 nicht überraschend.

Kritisch zu betrachten ist der Anstieg der Bierverfügbarkeit um 103% und obwohl die Weinverfügbarkeit um 19% sank, stieg die Verfügbarkeit von alkoholischen Getränken generell um 50%. Die grundsätzlich geringe Verfügbarkeit von Ölfrüchten stieg um beachtliche 75%, die Verfügbarkeit von pflanzlichen Ölen um 50%, während die von tierischen Fetten zwischen 1961 und 2003 gleich blieb. Die Verfügbarkeit von Zucker stieg um 24%.

Die Proportionen der Makronährstoffe veränderten sich zugunsten der Fettverfügbarkeit und auf Kosten der Kohlenhydratverfügbarkeit. Die Proteinverfügbarkeit stieg gering an.

Um die Europäischen Länder gründlicher zu vergleichen wurde ein Consumer Similarity Index (CSI) kalkuliert. Generell steigt die Ähnlichkeit der Nahrungsmittel in der EU, wobei geografische Nähe immer noch eine wichtige Rolle spielt, jedoch auch weit entfernte Länder sich ähnlicher werden. Im Durchschnitt war die Ähnlichkeit 1961 bei 80%, mit dem niedrigsten Wert von 57%. 2003 lag die durchschnittliche Ähnlichkeit bei 86% mit dem niedrigsten Wert schon bei 72%.

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