

# Trends in food availability in Austria – the DAFNE IV project

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## **Introduction**

The Austrian Household Budget Survey (HBS) is a national survey, collecting data about expenses and income of private households. Additionally, the HBS records data on the quantity of food and beverages acquired at household level. The Austrian HBS records all purchases, own production and payment in kind.

The nationally representative HBS provide a specific database of extensive household data in combination with socio-demographic characteristics.

In Austria the HBSs have a long tradition. In 1916 the Department of Commerce published a survey about the economical status of Viennese working-class-families. Since 1945 HBS have been carried out every 10 years. In 1999 the last survey was adapted to European standards, among others to the international COICOP nomenclature. The previous HBS data are not comparable with the results of HBS 1999/2000 due to amendments in the methodology. The next survey will be carried out in 2004/2005. (Statistik Austria, 2003)

The Austrian data provided to the DAFNE IV project, are based on the HBS carried out in 1999/2000. The DAFNE food classification system and socio-economic categories were applied to Austrian HBS data, in order to provide data comparable between countries. Valid estimations of food availability concerning food habits of the entire Austrian population and of population sub-groups defined on the basis of their socio-economic characteristics were reproduced. The DAFNE databank allows international comparisons and monitoring of daily food availability.

The present report presents data on the availability of the main DAFNE food groups among the Austrian population in 1999/2000. Food availability values are further monitored in relation to four socio-demographic factors affecting food choices (namely: education and occupation of the household head, and household's locality and composition).

## **Material and Methods**

### **Material**

Austrian daily individual food availability is based on data collected in the HBS in 1999/2000. The survey year was divided into 26 periods from November 1999 to October 2000. Each period required 14 days.

The sample unit was defined as “private household”, which means a person living alone or a group of people living together in the same private dwelling and sharing the essentials of living. It was not necessary that household members were related.

The survey was based on a sample of 7098 households. All types of private households were included, while institutional households were excluded. The response rate was 40.7 % and differed seasonally and regionally. During the Christmas and the vacation season approximately 200 households participated per recording period, but in spring and in autumn more than 300 households took part in the survey. Table 1 presents the distribution of households by the nine Austrian federal states.

The sample design generally followed a two-staged selection procedure for each federal state, excluding Vienna and Vorarlberg, where the selection procedure was one-staged.

### **Methods**

#### **Conversion of expenses into quantities**

##### **Conversion of recorded expenses into quantities on the basis of national annual market availability**

The households recorded the expenses for 81 food items and beverages. Quantities available in the households were recorded for 58 out of the 81 food items. The information on the remaining 23 food items refers only to expenses. In the case of the latter 23 items, Statistik Austria recommended a methodology to convert food expenditure to quantity data, making use of data on the Austrian annual market availability and the recorded HBS - expenses. (Statistik Austria, 2003)

The Austrian Statistical Office advised the following formula for the calculation:

Availability (in quantities) of food<sub>j</sub> =

$$\frac{\text{National Annual Market Availability}}{12} \times \frac{7098 \text{ hds}}{3\,241\,338 \text{ hds}} \times \frac{\text{Expenses of hds}_j \text{ for food}_j}{\text{Total expenses for food}_j}$$

where:

7.098: number of households (hds) participating in the 1999/2000 HBS.

3.241.338: total number of Austrian households (hds) in 1999-2000.

### **Conversion of expenses by the price per unit weight factor**

In cases, where only some of the households failed to record the acquired quantity and they only reported their related expenses, a *price per unit weight* factor was applied. In agreement with Statistik Austria, factors on the cost per unit were estimated for each food item and each participating household, providing that the household has collected adequate information. The medians of these factors were estimated for each food item and they were then applied for converting expenses to quantities.

### **Harmonisation of food and socio-demographic information**

Data collected in the Austrian HBS 1999/2000 were analysed and DAFNE rules and procedures were applied. Individual daily availability was estimated under the assumption of equal distribution of food within the household and during the survey period.

Food items were classified under the 15 main DAFNE groups as well as under the 57 specific food groups.

In the DAFNE databank, the households are classified according to the following socio-demographic characteristics:

- the household's locality,
- the household's composition,
- the educational level of the household head and
- the occupation of the household head.

The DAFNE scheme for **household characteristics** described in detail:

**Locality** was classified under three categories:

- Rural
- Semi-urban
- Urban

The Austrian classification of locality was defined on the basis of **population density**:

**Urban areas** were defined as those of *high population density* – This area (which is a municipality or a group of municipalities, which border on each other) had at least 50.000 inhabitants, and more than 500 inhabitants/km<sup>2</sup>

**Semi-urban areas** were defined as those of *medium population density* – This area had at least 50.000 inhabitants, and more than 100 inhabitants/km<sup>2</sup> (but less than 500 inhabitants/km<sup>2</sup>)

**Rural areas** were defined as those of *low population density*. This includes all the remaining areas.

Municipalities, which do not attain a population density of more than 500 inhabitants/km<sup>2</sup> or more than 100 inhabitants/km<sup>2</sup>, were counted among “High density” and “Medium density” areas, when they were surrounded from such areas, respectively.

Food availability was estimated for eight types of **household composition**:

- Households of a single adult
- Households of two adult members
- Households of one adult resident and children (lone parents)
- Households of two adult members and children
- Households of adult and elderly residents
- Households of children, adult and elderly residents
- Households of single elderly
- Households of two elderly residents

Children were defined as up to 18 years of age, adults from 19-65 years of age and elderly as more than 65 years old.

**Education of the household head** was classified according to the following three categories:

- Illiterate/Elementary education
- Secondary education
- Higher education

The educational level of the household heads were assigned to the above three categories following a combination of variables reflecting years of schooling and educational attainment.

**Occupation of the household head** was classified under five categories:

- Manual
- Non-manual
- Retired
- Unemployed
- Others (students, housewives)

The classification was defined on the basis of the current participation in gainful employment and on the description of the job.

## **Results**

The overall mean availability per person per day was estimated for the main DAFNE food and beverages groups:

- Cereals and cereal products (g)
- Potatoes and other starchy roots (g)
- Pulses (g)
- Vegetables (fresh and processed) (g)
- Fruits (fresh and processed) (g)
- Nuts (g)
- Meat, meat products and dishes (g)
- Fish, seafood and dishes (g)
- Eggs (pieces)
- Added lipids (fats and oils) (g)
- Milk and milk products (g)
- Sugar and sugar products (g)
- Alcoholic beverages (ml)
- Non-alcoholic beverages (ml)
- Juices (fruit and vegetable) (ml)

➤ **Food/Beverage availability in the overall population**

In Table 2, the mean daily individual availability of the DAFNE food groups, based on a nationally representative population sample is shown.

In the Austrian HBS there is no separate information for pulses and nuts. In the questionnaire of the 1999/2000 HBS, pulses were classified under dried vegetables. The participants recorded dried herbs, lentils, beans and others together in the same group and there is no specification about the proportion of the respective food item under this food code. It should however be noted that the consumption of pulses is not significant among the Austrian population.

In the case of nuts, they were classified under dried fruits in the questionnaire. The participants recorded dried pears, dried fruit, sweet chestnut nuts, raisins and others together in the same column and the proportions of the food items under the dried fruits group are unknown. Again, in the Austrian diet nuts are of minor importance.

According to the DAFNE classification scheme, the dried vegetables and dried fruits codes are grouped under the groups of processed vegetables and processed fruits, respectively.

**Comparisons with other DAFNE countries.**

Data on the daily individual food availability in the 1990s were retrieved from the DAFNE databank. In Austria and Germany households recorded fruit availability of more than 180g/person/day.

Hungary (80g/person/day) and Norway (79 g/person/day) recorded higher daily availability of sugar and sugar products than Austria (74g/person/day). United Kingdom (31g/person/day), Portugal (35 g/person/day) and Spain (35g/person/day) recorded lower daily availability of these products.

Hungary recorded the lowest availability of fish, seafood and dishes (4.4 g/person/day), Austria recorded 9.3 g/person/day in 1999/2000. Portugal is leading fish availability with 85g/person/day, followed by Spain (74 g/person/day), Norway (50 g/person/day) and Greece (45 g/person/day).

Greece recorded the highest vegetable availability within the household (271 g/person/day); Norway has the lowest vegetable availability (109 g/person/day). Austria (142g/person/day) had the lowest vegetable availability among all Central European countries.

The highest availability values of alcoholic beverages within the household were recorded in Germany (200 ml/person/day) and the lowest in the UK (51 ml/person/day) and in Greece (48 ml/person/day). Austria had a daily availability of alcoholic beverages of 171 ml/person/day.

In comparison to Germany, Austria recorded lower values of non-alcoholic beverages (915ml/person/day and 652 ml/person/day, respectively).

Hungary and Austria recorded the highest meat, meat products and dishes availability (190g/person/day and 182g/person/day, respectively), while Norway the lowest (126g/person/day). [The DAFNE databank ([www.nut.uoa.gr](http://www.nut.uoa.gr)) 13.10.04]

### **Results by socio-economic and demographic groups**

**Locality:** Urban households had higher availability of cereals, vegetables, fish and seafood, non-alcoholic beverages and juices and the lowest availability of added lipids. In semi-urban zones the availability of fruits and alcoholic beverages were higher than in urban and rural households. The highest availability of potatoes, meat, milk products and sugar products was recorded in households in rural areas. (Figures 1 and 2)

**Household composition:** Single adult households had higher daily availability of eggs, cereals, milk and milk products, fruits, alcoholic and non-alcoholic beverages, sugar and sugar products, fruit and vegetable juices in comparison to households of two adult members. Two adult member households had higher availability of potatoes, meat, fish and seafood, vegetables and added lipids than single adult households.

Lone parent households recorded higher availability of eggs, potatoes, cereals, milk and products, vegetables, fish and seafood, fruits, added lipids, non alcoholic beverages, sugar and sugar products, fruit and vegetable juices and lower availability of meat and alcoholic beverages than households two adults with children.

Single elderly households had higher availability of eggs, potatoes, cereals, milk and milk products, meat, vegetables, fruits, added lipids, non alcoholic beverages, sugar and sugar products, fruit and vegetable juices and lower availability of fish and seafood and alcoholic beverages than the two elderly households.

With the exception of meat and meat products, alcoholic and non-alcoholic beverages and juices elderly households recorded higher daily availability of all food items. (Figure 3) This is a pattern observed in the majority of the DAFNE countries. Households of elderly members seem to generally acquire larger food quantities.

**Education of the household head:** Households of lower educated heads had a higher availability of potatoes, eggs, cereals, meat, vegetables, fruits, non alcoholic beverages, sugar and sugar products than those of educated heads. The availability of juices, fish and seafood was higher and the availability of alcoholic beverages, potatoes and added lipids was lower among the more educated households. (Figure 4)

**Occupation of the household head:** The retired population had the highest availability of potatoes, cereals, meat, vegetables, fruits, added lipids, fish and seafood, milk products and eggs and the lowest availability of juices in comparison with household heads of the other occupation status.

Non-manual workers had the lowest availability of added lipids and potatoes. The households of unemployed heads recorded the highest availability of juices; manual workers had the lowest availability of fish and seafood. Unemployed households had higher daily food availability of nearly all food groups, except for eggs, non-alcoholic beverages, sugar and sugar products. Manual households showed higher daily food availability of these three food items than non-manual households. (Figure 5)

## **Discussion**

### **Comparison of the Austrian DAFNE results with other sources of dietary data**

The DAFNE Austrian data were compared with results from the Austrian Study on Nutritional Status (ASNS) and with data retrieved from the Food Balance Sheets (FBS). The HBS data depicts home food availability in Austria. The ASNS data –analysed by the Institute of Nutritional Sciences, University of Vienna – describes food intake in Austria. The FBS data -



compiled by the Food and Agricultural Organization of the United Nations- shows average supply of food for human consumption in Austria. The comparisons were crude and a more elaborate approach would require addressing the limitations and methodological differences between these three types of data.

### **Comparisons with Food Balance Sheets**

The values from the Austrian Food Balance Sheets 1999 (FAO 1999) are higher than the corresponding HBS for all food groups. The differences vary from only +1% for cereals to +330% for fish and seafood. A difference of 20% was found for eggs. Values higher than 50% were estimated for fruits (+58,9%) potatoes (+71%), meat (+71,9%), vegetables (+74,6%), sugar and products (+68,9%), added lipids (+138%), alcoholic beverages (+144,4%) and milk and products (+169%). (Table 2)

### **Comparisons with the Austrian Study on Nutritional Status (ASNS)**

The ASNS study aimed at assessing the nutritional status of different population groups in Austria. Participants were 19-65 years of age and single 24-hour recalls were used for the dietary assessment (Elmadfa 2003). Results from the ASNS of 2000-2002 are lower than HBS for most of the food groups with the exception of vegetables (+4,2%), fish/seafood (+104,3%) and alcoholic beverages (+19,3%). Lower ASNS-results expressed in different proportions depending on the food group varies from only 4,7% for fruits to 52% for potatoes. Difference higher than thirty percent were noted for meat (-31%), added lipids (-33%), fruit and vegetable juices (-37%) and eggs (-40%). (Table 2)

For the discrepancies observed between these three types of dietary data the following issues need to be considered:

- **Food wastage:** HBS data are expected to be higher than ASNS, since food wasted during preparation and consumption was not considered in the HBS. The HBS data were also expected to be lower than FBS, since losses on transport, storage and processing were incorporated in HBS.
- **The lack of information on food and beverages consumed outside the household:** In the HBSs food and beverages consumed in bars/restaurants are only recorded in expenses, without differentiating the kind of meals and beverages.

- **The lack of information on food and beverages consumed in institutional households:** By definition, the HBSs do not include information on food consumed in institutional households, which could partly explain the higher FBS values.
- **The age and the sex of the household members were not considered, when individualising the daily availability:** Equal distribution of food and beverages within the household was assumed.

### **Food and beverages consumed out of home**

In Austria 15-20% of the total meal expenditures are used for food and beverage acquisition outside the household. The percentage cannot be specified exactly, because the expenditures in bars/restaurants do not allow a differentiation between food, drinks and other expenditures. (Statistik Austria 2003). Food and beverages consumed out of home were not recorded in quantities in the Austrian 1999 HBS.

### **Trends and patterns in the daily food availability**

Due to the fact that previous HBS are not comparable with the results of HBS 1999/2000 because of differences in the methodology and standards, Austrian trends in daily food availability based on HBS cannot be followed. The incorporation of new data in the database will provide for this possibility.

Data on the mean food availability of main food groups show that on average cereals and milk products dominate the diet of Austrians, whereas fish and seafood are of minor importance (Table 2). The recommended 600 grams of fruit and vegetables per person per day (DGE 2004) are expected to help reducing the risk of some cancers, heart disease and other chronic conditions. The Austrian mean daily availability of vegetables, fruits and juices did not attain the recommended quantity (Table 2). Figure 6 shows the percentage contribution of the daily vegetable and fruit availability. The staple foods of plant origin “cereals and potatoes” attain together a daily food availability of 403 grams per person per day (Figure 6). The availability of meat and meat products (Table 2) seems to be high compared to the recommended 300-600 grams per week (DGE 2004).

#### **➤ Association of food availability with socio-economic characteristics**

Food availability by locality showed that rural households had the highest availability of sugar and products, potatoes and food of animal origin, with the exception of fish and seafood.

The daily availability in semi-urban households was the highest for alcoholic beverages and fruits, and the lowest for milk and products. In urban areas households had the lowest availability of alcoholic drinks, but the highest availability of non-alcoholic beverages, fruit and vegetable juices.

“Elderly” and “retired” households recorded more food available at household level compared with the other household composition and occupation groups. Hence it is likely that elderly people are eating at home in most instances. It can be expected that employed people have meals away from home during their breaks. In addition, the missing information on meals consumed out of home is not expected to affect employed and unemployed households equally.

Across the four socio-economic DAFNE-categories, the lowest availability of eggs and added lipids were recorded in urban, or in non-manual households, or among households of high educated head. The daily availability of potatoes, eggs, meat, added lipids, non-alcoholic beverages, sugar and sugar products decreased with educational level, while that of fish and seafood increased. The average availability of eggs, potatoes and meat decreased from households of elementary to higher educational level and from the rural to the urban households. Urban households seemed to prefer cereals, vegetables, non alcoholic beverages, fruit and vegetable juices.

## References

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**Table 1:** Distribution (%) of households participating in the 1999/2000 Austrian household budget survey, by federal states

<b>Federal States</b>	<b>No of households (%)</b>
Burgenland	553 (7.8)
Kärnten	758 (11)
Niederösterreich	967 (14)
Oberösterreich	1020 (14)
Salzburg	656 (9.2)
Steiermark	1004 (14)
Tirol	658 (9.3)
Vorarlberg	814 (12)
Wien	668 (9)
<b>TOTAL</b>	<b>7098</b>

**Source:** Statistik Austria 2003

**Table 2:** Comparison of results on dietary patterns in Austria between DAFNE, the Austrian Study on Nutritional Status (ASNS) and Food Balance Sheets (FBS) (quantity/person/day)

<b>Food Groups – Austria</b>	<b>HBS (DAFNE)*</b>	<b>Intake**</b>	<b>Food Balance Sheets***</b>
<b>Eggs (pieces)</b>	0.5	0.3	0.6
<b>Potatoes and other starchy roots (g)</b>	100	48	171
<b>Pulses (g)</b>	****	****	2.7
<b>Nuts (g)</b>	****	****	16
<b>Cereals and cereal products (g)</b>	303	287	306
<b>Milk and milk products (g)</b>	284	263	764
<b>Meat and meat products (g)</b>	182	125	313
<b>Vegetables (fresh and processed)(g)</b>	142	148	248
<b>Fish and seafood (g)</b>	9.30	19	40
<b>Fruits (fresh and processed) (g)</b>	192	183	305
<b>Total added lipids (g)</b>	42	28	100
<b>Alcoholic beverages (ml)</b>	171	204	418
<b>Non alcoholic beverages (ml)</b>	652	n.c.	n.c.
<b>Sugar and products (g)</b>	74	n.c.	125
<b>Juices (fruit and vegetable) (ml)</b>	90	57	n.c.

\* Data collected in 1999-2000. In the analysis, no allowance is made for food wasted or given to pets. Individual values were also estimated, without taking into account age and sex differences of the household members

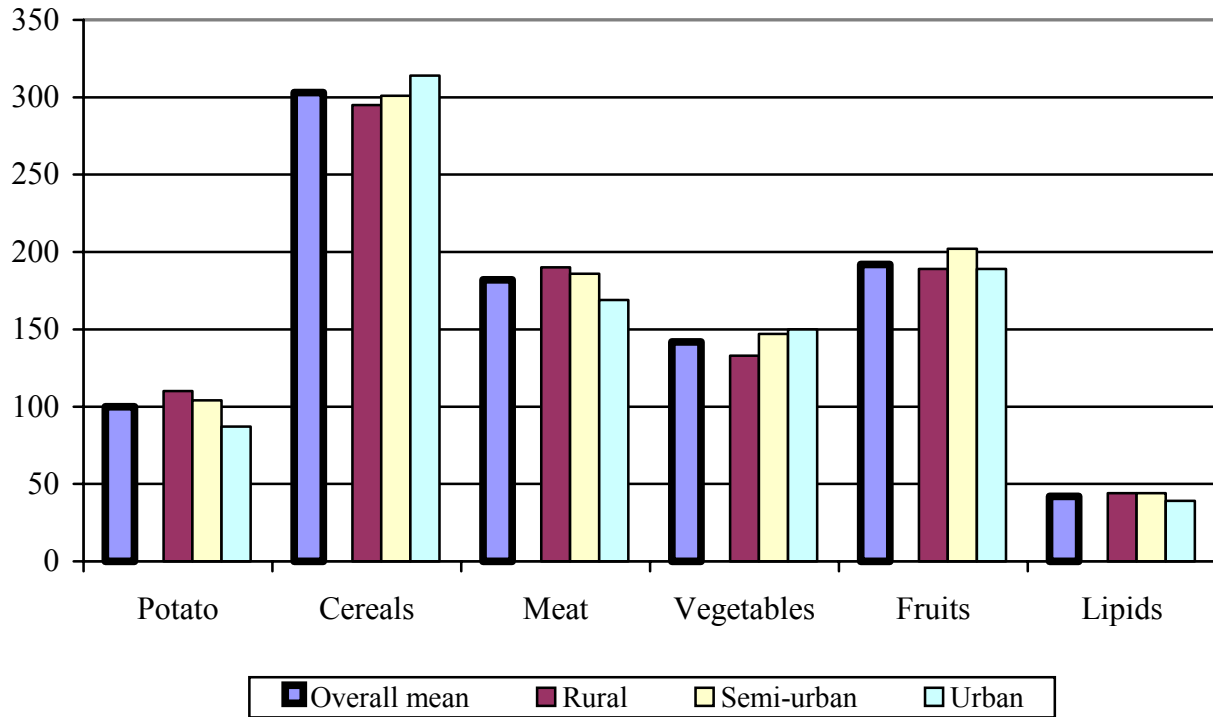
\*\*Austrian Study on Nutritional Status (ASNS), adults 19-65 y., single 24-h-recall, n=2585, collected 2000-2002.

\*\*\*<http://faostat.fao.org/faostat/form> (13.10.04), Food Balance Sheets 1999, original data were expressed in kg/year/capita; daily values were derived by multiplying with 1000 and dividing by 365.

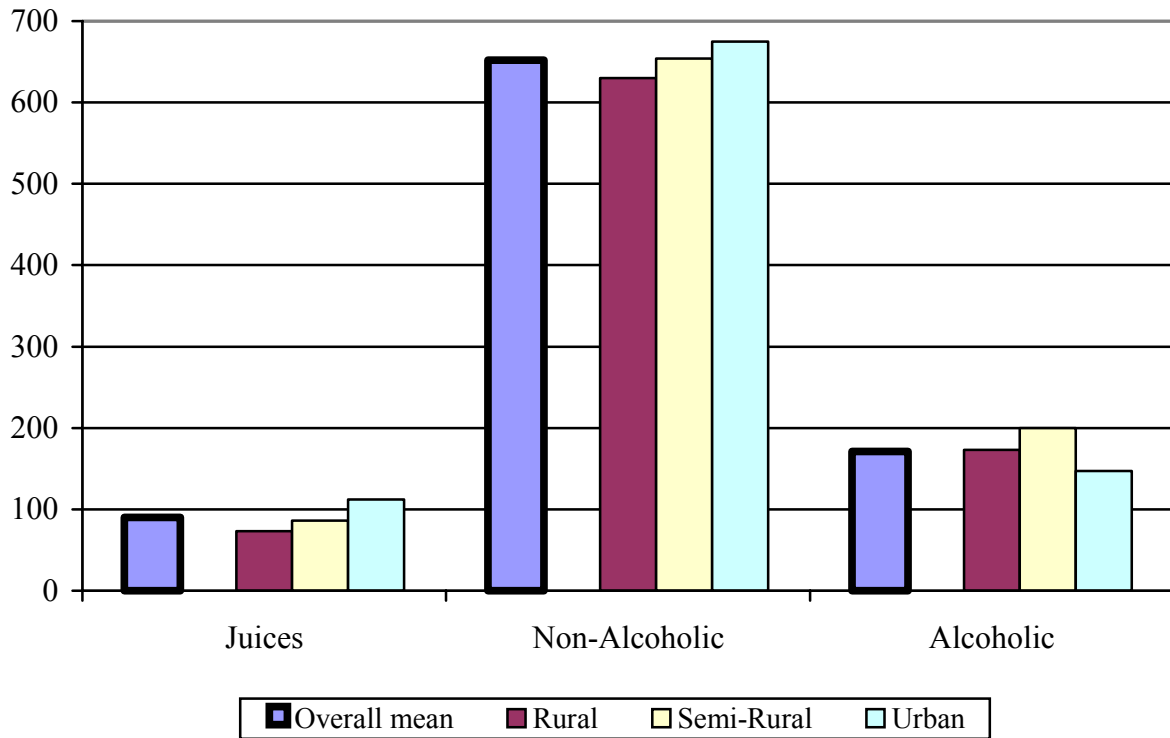
\*\*\*\* There is no separate information about pulses and nuts, since they are included in other food codes and have been classified under processed vegetables and processed fruits, respectively.

n.c.: not quantifiable

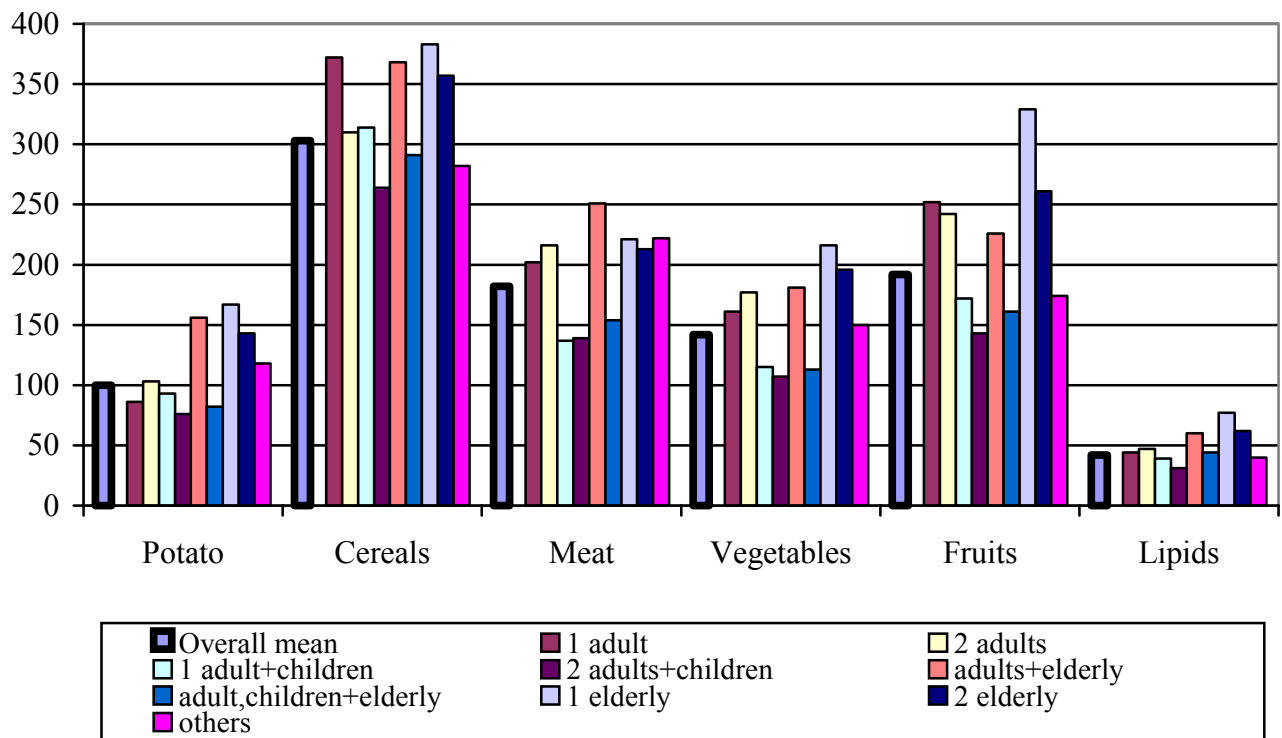
**Figure 1:** Mean food availability in Austria by locality of the dwelling, in 1999/2000, (g/person/day)



**Figure 2:** Mean beverage availability in Austria, by locality of dwelling, in 1999/2000, (ml/person/day)

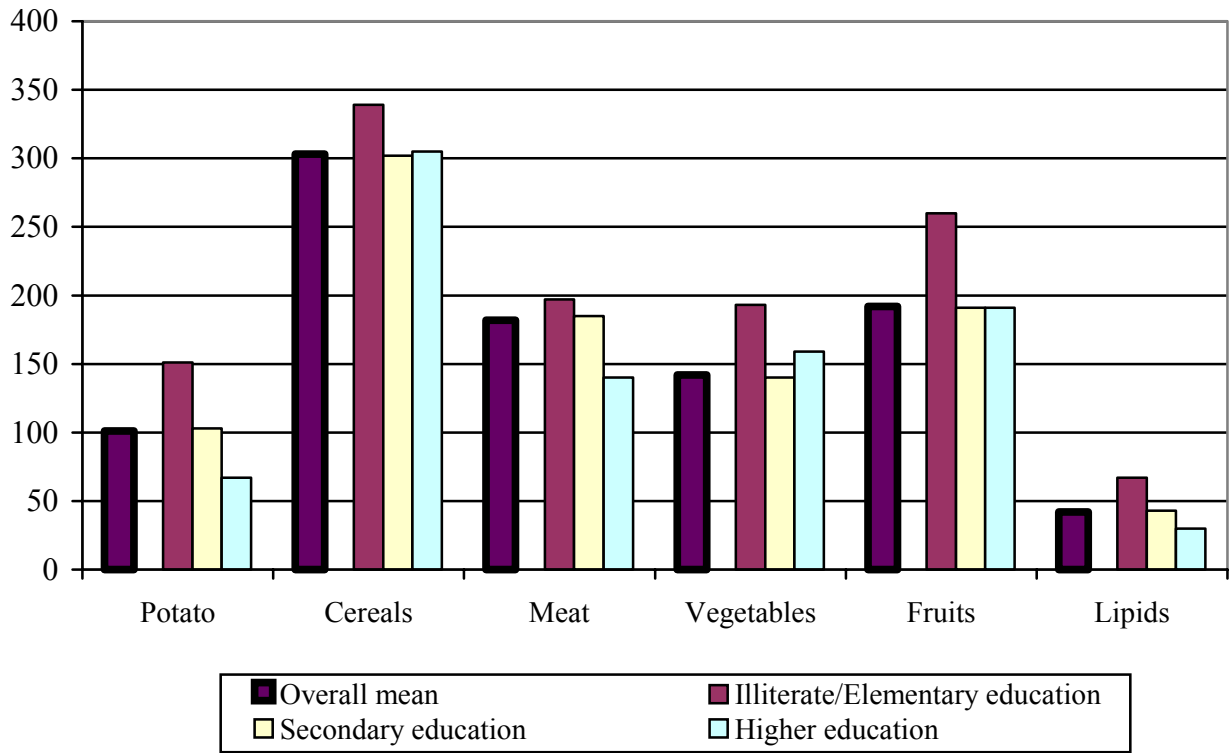


**Figure 3:** Mean food availability in Austria by household composition in 1999/2000, (g/person/day)

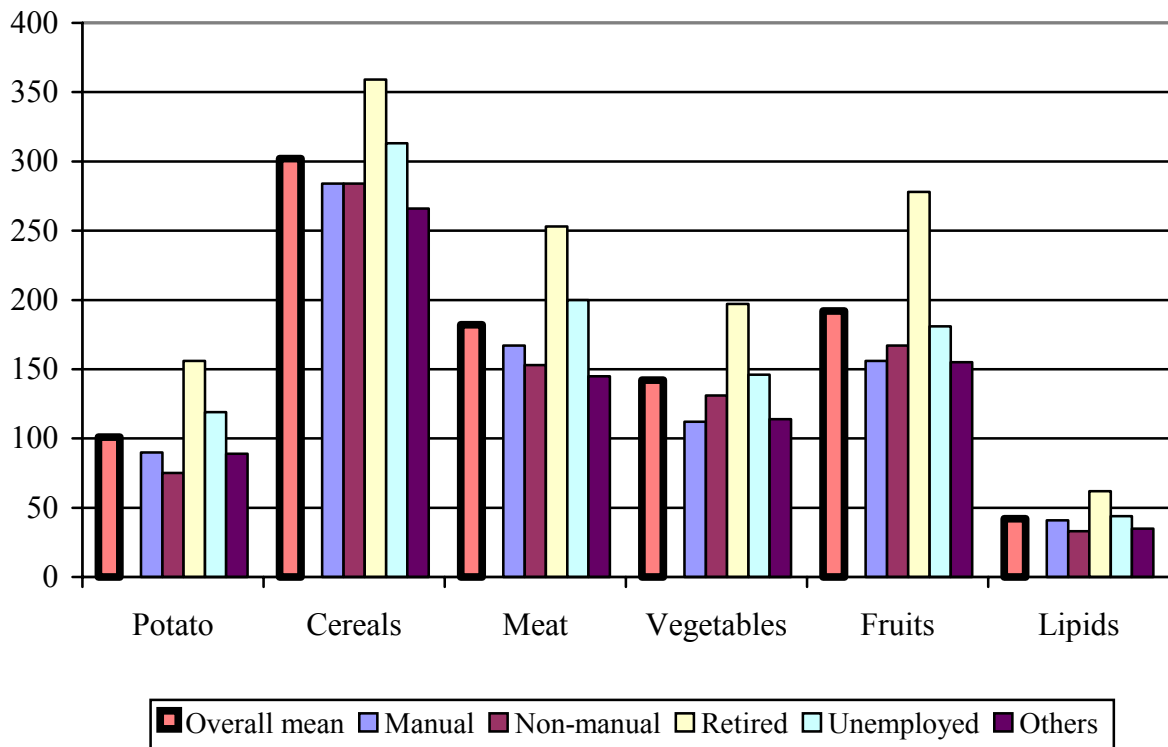


**Figure 4:** Mean food availability in Austria by education of the household head in 1999/2000, (g/person/day)

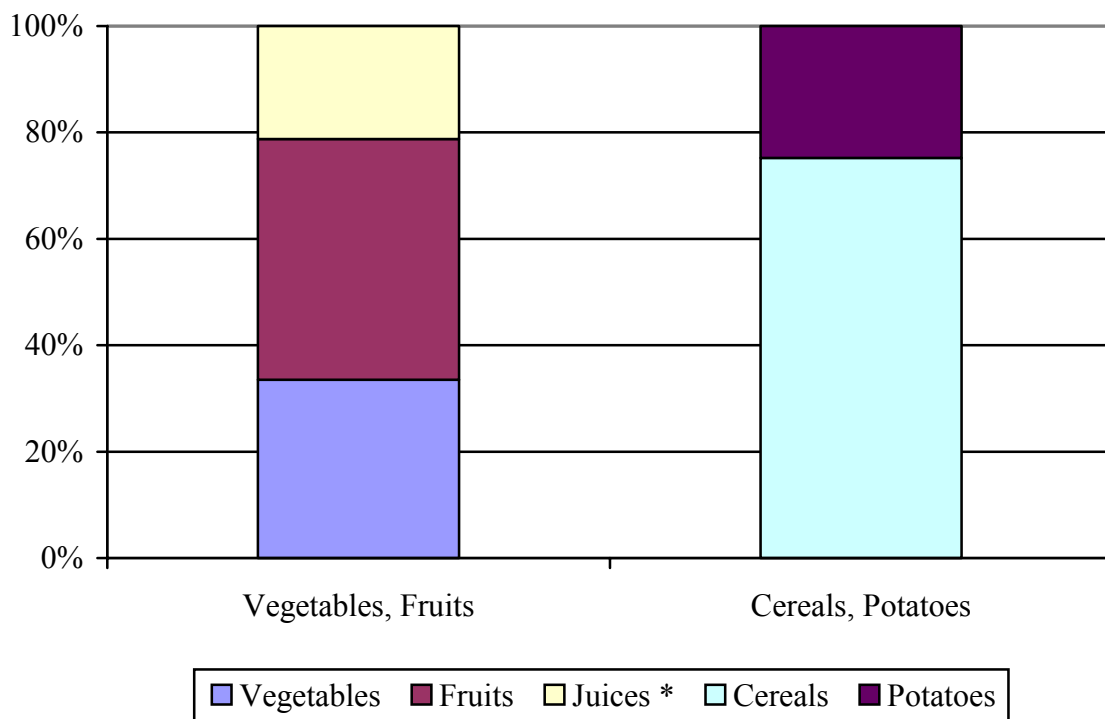




**Figure 5:** Mean food availability in Austria by occupation of the household head in 1999/2000, (g/person/day)



**Figure 6:** Mean availability of foods of plant origin in Austria in 1999/2000, (quantity/person/day)



\* 90ml/day = 90g/day



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