

Trends in food availability in SLOVENIA – the DAFNE V project

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Introduction

The Slovenian Household Budget Survey (HBS) is a national survey, collecting data on expenses and income of private households. Additionally, the HBS records data on the quantity of food and beverages acquired at household level. The Slovenian HBS records all purchases, own production and payments in kind. In addition, the nationally representative HBS provide a database of unique characteristics including extensive household data in combination with socio-demographic characteristics.

HBS have been carried out since 1983. The survey contents and methodology remained unchanged until 1997 when some changes were introduced, in order to have the survey harmonised with Eurostat's recommendations. It also became a continuous one.

The Slovenian data, provided to the DAFNE V project, are based on the HBSs carried out in 1998, 2000 and 2002. The DAFNE food classification system and socio-economic categories were applied to the Slovenian HBS data, in order to provide comparable between countries data.

Valid estimations of food availability concerning food habits of the overall Slovenian 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 the mean, daily food availability. Furthermore, the application of DAFNE methods allows for the results to be comparable to those of other European countries.

The present report presents data on the availability of the 15 main DAFNE food groups among the Slovenian population in 1998, 2000 and 2002.

Food availability values are further monitored in relation to three socio-demographic characteristics affecting food choices (namely: education and occupation of the household head,

and household's composition). To evaluate the effect of socio-demographic characteristics overtime, differences were calculated on the basis of the last HBS (2002).

Material and Methods

Material

Slovenian daily individual food availability is based on data collected in observed HBS period 1998 – 2002.

Since 1997, the Slovenian HBSs is a continuous survey undertaken on yearly rounds in samples of approximately 1,300 households. The DAFNE coordinating center has been provided with three datasets indicated as: "Survey of 1998"; "Survey of 2000" and "Survey of 2002". In order to increase the sample size, the following procedure was applied for the preparation of the provided datasets. The procedure is described on the basis of the "2002" dataset, but similar is the case for the other two. The 2002 dataset includes the data collected in 2002, as well as imputed data collected in 2001 and in 2003. The 2001 and 2003 data, before being added in the dataset, were adjusted taking into account the information collected in 2002, so that the new adjusted datasets include the information these households would have recorded if they participated in 2002 (imputations were made on the basis of the households' characteristics). The 2002 dataset was thus based on a sample of 3687 households (11652 members) distributed through three years period. All types of private households were included, while institutional households were excluded. The response rate was 76.6 % and differed seasonally and regionally.

Similar is the case for the "1998" and the "2000" data. This means that the "1998" dataset includes the 1998 original data, as well as data collected in 1997 and 1999, but imputed on the basis of the 1998 dataset. Similarly, the "2000" dataset includes the 2000 original data, as well as imputed data collected in 1999 and 2001.

Methods

Sample stratification was based on 12 statistical regions and 6 types of settlements (territories). In larger settlements (with over 10,000 inhabitants) simple sampling was used, whereas in smaller settlements cluster sampling with four persons defining the household was applied. The

sample was equally distributed throughout the year. Substitution was not used for refusals; instead the sample was enlarged given the response rate of previous years.

Households as observational units are either groups of persons who live together, eat together and spend their income together, or single persons who live and eat on their own and independently use meals.

The survey does not cover collective households such as boarding schools, nursing homes for children, old people's homes, hospitals, homes for pupils (hostels of secondary school students, student hostel dwellings, etc).

Data on **available** and **allocated assets** of households and data on principal elements of personal consumption were given by the household members directly to the interviewers of the Statistical Office of the Republic of Slovenia (face-to-face interviews on the basis of questionnaire and diaries). Household members collected information on daily expenditure and acquired quantities (purchases, benefits in kind and own production) for 14 days.

As previously described, published results in the period of one year are based on combination of the sample of three consecutive years. Data are calculated to the middle year, which is used as reference.

Available assets cover all available money assets, own production and benefits in kind at households' disposal during the observational period. Available money assets of a household cover all financial income that was received by the household members in 12 months. Own production covers the value of own agricultural products and goods consumed within a household during the year. The cost of agricultural products and goods is calculated according to average selling prices. Benefits in kind cover goods that the household received:

- from employment (employer covering the household's expenditure for electricity, cold water, gas, telephone, TV subscription, vehicle registration, free meals, etc.) and
- other (relatives or friends).

Allocated assets cover consumption expenditure, expenses for the house maintenance (major works and renovations) and other expenditures (e.g. taxes and self-imposed contributions,

savings, money transfers and gifts) In addition to the value of purchased goods and services, allocated assets also cover the household's own production.

Harmonisation of food and socio-demographic information

Data collected in the Slovenian HBS 1998, 2000 and 2002 were analysed according to the DAFNE rules and procedures. Individual daily availability of foods and beverages (expressed as quantity/person/day) was estimated under the assumption of equal distribution of food within the household and during the survey period.

Food items were grouped with the application of the DAFNE food classification scheme (European Commission: The DAFNE food classification system. Operationalisation in 16 European countries. pp. 1-317. European Commission, Luxembourg 2005).

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

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

In the DAFNE project, daily food availability is further estimated by the household's locality. This analysis was however not performed in the case of Slovene data, as statistical power of regional data is too weak.

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 (i.e. students, housewives, invalid persons)

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 15 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)

Selected graphs (Figure 1 to 6) are presented to illustrate the daily availability for the overall population and population sub-groups in 14 main food groups (group of “Eggs” is excluded because of different units).

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

Table 1 presents, the mean, daily, individual availability of the main DAFNE food groups, based on nationally representative population samples.

Trends and patterns in the daily food availability among observed period: Trends in food availability are shown in Figures 1-2. The daily availability of fish/seafood and nuts have increased; while the availability of cereals, fruits, vegetables, sugar/sugar products, lipids and potatoes have decreased (Figure 1).

With respect to beverages, the daily household availability of fruit/vegetable juices has increased and the household availability of non-alcoholic beverages (excluding juices) has decreased. There is no variation in the availability of alcoholic beverages during the observation period (Figure 2).

Results by socio-economic and demographic groups

Household composition: Household composition seems to have a considerable influence on food availability.

Availability of most of the food groups is generally higher among one-member (single) households. Single adult households recorded the highest availability of potatoes, cereals and meat, while single elderly households recorded the highest availability of vegetable, fruits, added lipids, alcoholic and non-alcoholic beverages (including tea and coffee). The increased food availability among elderly households is a consistent finding in the majority of the DAFNE countries and could be attributed to rare eating out occasions, to a tendency of elderly people to accumulate food or to cooking for their children’s households (Figure 7 to 9).

Education of the household head: The daily availability of most of the food groups is generally higher among households with heads of elementary education. However, elementary education is associated with the lowest availability of fish/seafood and fruit/vegetable juices.

Household with heads of secondary education reported the acquisition of the lowest quantities of milk products, fruits and non-alcoholic beverages.

The availability of potatoes, cereals, meat, vegetables, added lipids, sugar/sugar products, pulses and alcoholic beverages is the lowest and the availability of fish/seafood and fruit/vegetable juices is the highest among households whose heads were of higher education (Figures 3 and 4).

Occupation of the household head: Availability of most of the food groups, with the exception of fruit and vegetable juices, is generally higher among households of retired members. Non-manual households, however, reported the lowest availability of cereals, meat, vegetables, potatoes, sugar and sugar products, added lipids and pulses. Manual households recorded the lowest availability of milk products, fruits, fish/seafood, non alcoholic beverages and juices (Figures 5 and 6).

Results on the groups of "*Unemployed*" and "*Others*" are not presented due to the small number of households classified under this category.

Discussion

Comparison of the Slovenian DAFNE results with other sources of dietary data

The Slovenian DAFNE data were compared with results from the Slovenian Study on Nutritional Habits of Slovenian adults (SNH) (Koch, 1997), undertaken in 1995 among a nationally representative sample of adults 18-65 years old. Dietary data were collected through interviewer administered food frequency questionnaires and 24-hour recalls. In spite of differences in the study samples, in the data collection methodology and in the reference periods which severely limit the comparability of the two data sources (DAFNE versus SNH), results are commonly displayed in Table 1. As in the SNH there is no data available for the consumption of nuts and the values for pulses refer to the product's final weight (and not the dry weight, as in HBS), these two food groups were not included in the Table.

The HBS-DAFNE data depict food availability in the average household in Slovenia. The SNH data describe the food and nutrient intake of Slovenian adults (including food/beverage consumption out of home). (Koch, 1997). Bearing in mind methodological differences, crude

comparisons between the two data sources showed large percent differences between food availability (HBS-DAFNE) and food intake (SNH) data in juices, fish/seafood, sugar/sugar products, vegetables and small differences in potatoes and other starchy roots, and non-alcoholic beverages. Intake results from the SNH (Koch, 1997) are generally lower than availability HBS-DAFNE results (1998) for half of the food groups, including eggs, potatoes/other starchy roots, cereals/cereal products, meat/meat products, added lipids, sugar/sugar products and non alcoholic beverages. To allow for more valid comparisons, however, a more elaborated approach addressing the following limitations and methodological differences is required:

- The age and sex of the household members were not considered, when individualising the household availability and equal distribution of food and beverages within the household was assumed.
- DAFNE data are expected to be higher than SNH, since food wasted during preparation and consumption was not considered in the HBS.
- By definition, the HBS do not include information on food consumed by institutionalised individuals (such as prisoners, individuals in homes for the elderly),
- Larger differences would however be expected, considering the fact that within the HBS data information on types and quantities of foods and beverages consumed out of home is lacking on one side and the fact that most of the children and adolescent are having at least one up to four meals out of home on a regular basis due to a well-organized school meal system in Slovenia.

Food and beverages consumed out of home: The lack of detailed information on eating out is a limitation of the HBS data. We estimated that 18 to 20% of the total food/beverage expenditures are used for food and beverage acquisition outside the household in Slovenia in the last 10 years. The percentage cannot be specified exactly, because the expenditures in bars/restaurants do not allow a differentiation between foods, drinks and other expenditures (Kuhar and Čurk, 2005).

Trends and patterns in the daily food availability: Data on the mean food availability of main food groups show that, on average, cereals and milk products dominate in the diet of Slovenes, while pulses, fish and seafood are of minor importance (Figure 1).

The recommended intake of 400 to 650 grams of fruit and vegetables per person per day for the Slovene population (Maučec Zakotnik et al., 2005) are expected to help reducing the risk of some cancers, heart disease and other chronic conditions. The Slovenian mean daily availability of vegetables, fruits and juices show that the recommended intake may not be reached, as the availability of fruits was 214 g/person/day, vegetables 185 g/person/day and juices 108 ml/person/day (Figure 1 and 2). Data further point out that adults and children prefer to consume fruits than vegetables (Koch, 1997; HBSC, 2002).

Meat and meat products exceeded 197 g/person/day, while fish and seafood mean availability is 11 g/person/day. The share of fish and seafood should be increased, given current health recommendations.

Results for the period under study are showing a slight increase in the availability of fish/seafood and nuts; a slight decrease in the availability of cereals, fruits, vegetables, sugar/sugar products and lipids; and, a substantial decrease in the availability of potatoes (Figure 1), which could be attributed to the more time needed for meal preparation. This decrease seems to be counterbalanced by an increase in the consumption of pasta, which is becoming very popular in the diet of Slovenians.

A slight increase was observed in the availability of fruit and vegetable juices and a slight decrease in the household availability of non-alcoholic beverages. This trend could be explained by the increasing consumption of juices replacing other beverages, in line with a healthy diet promotion. There is no variation on the availability of alcoholic beverages in the observed period (Figure 2).

Association of food availability with socio-economic characteristics: Households of “Elderly” and/or “retired” members recorded more food available at household level compared with the other household composition and occupation groups, probably reflecting more eating at home for elderly individuals. In addition, elderly and retired people usually purchase larger quantities in order to supply their children’s households and to help with meal provision as they have more time available for cooking.

Active population has meals out of home during their (work) breaks and the missing information on meals consumed out of home is expected to differentially affect employed and unemployed households.

Lower household availability of most of food groups were recorded among households of higher educational level, while the mean daily availability of fish/seafood and fruit/vegetable juices is higher.

The lowest availability for most food groups is recorded among non-manual households, while availability of fish/seafood, fruits, non-alcoholic beverages and fruit/vegetable juices is the lowest among manual households. Possible explanation is that households with higher education and income recorded the highest food/beverages consumption out of home (Kuhar and Čurk, 2005)

Food availability by locality was not calculated due to weak statistical power of regional data.

Detailed data on food availability for more food groups will be made available through DafneSoft, a web-based application tool freely available at <http://www.nut.uoa.gr/dafnesoftweb> which further allows comparisons of results to those of other DAFNE countries.

Conclusion

This was the first time that Slovenia participated in the DAFNE project. International comparisons will enable evaluating the country's situation in relation to that of other European countries. In addition, through the DAFNE project, HBS methodology was further explored and tools for nutritional use were used in collaboration with the project Coordinator. Interesting differences between compared subcategories within the sample are giving us challenges for further work.

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Table 1: Comparison of results on dietary patterns in Slovenia between DAFNE and Slovenian study on nutritional habits of Slovenian adults (SNH) (quantity/person/day)

Food Groups – Slovenia	HBS (DAFNE)*	Intake SNH**	Difference (%)***
Eggs (pieces)	0,50	0,40	+0.1 (20%)
Potatoes and other starchy roots (g)	173	160	+13(8%)
Cereals and cereal products (g)	352	291	+61 (18%)
Milk and milk products (g)	353	399	-46 (13%)
Meat and meat products (g)	190	159	+31 (16%)
Vegetables (fresh and processed)(g)	181	242	-61 (34%)
Fish and seafood (g)	11	17	-6 (55%)
Fruits (fresh and processed) (g)	233	267	-34 (15%)
Total added lipids (g)	65	46	+19 (29%)
Alcoholic beverages (ml)	162	184	-22 (14%)
Non alcoholic beverages (ml)	617	575	+42 (7%)
Sugar and products (g)	87	44	+43 (49%)
Juices (fruit and vegetable) (ml)	65	182	-117 (180%)

* Data collected in 1998 among household members aged 1-97 years. 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

** Slovenian study on Nutritional Habits, adults 18-65 y., food frequency questionnaires, n=2183, collected in 1995.

*** Estimated as (HBS-SNH).

Figure 1: Mean daily availability of 11 food groups for Slovenia, in 1998/2000/2002 (g/person/day)

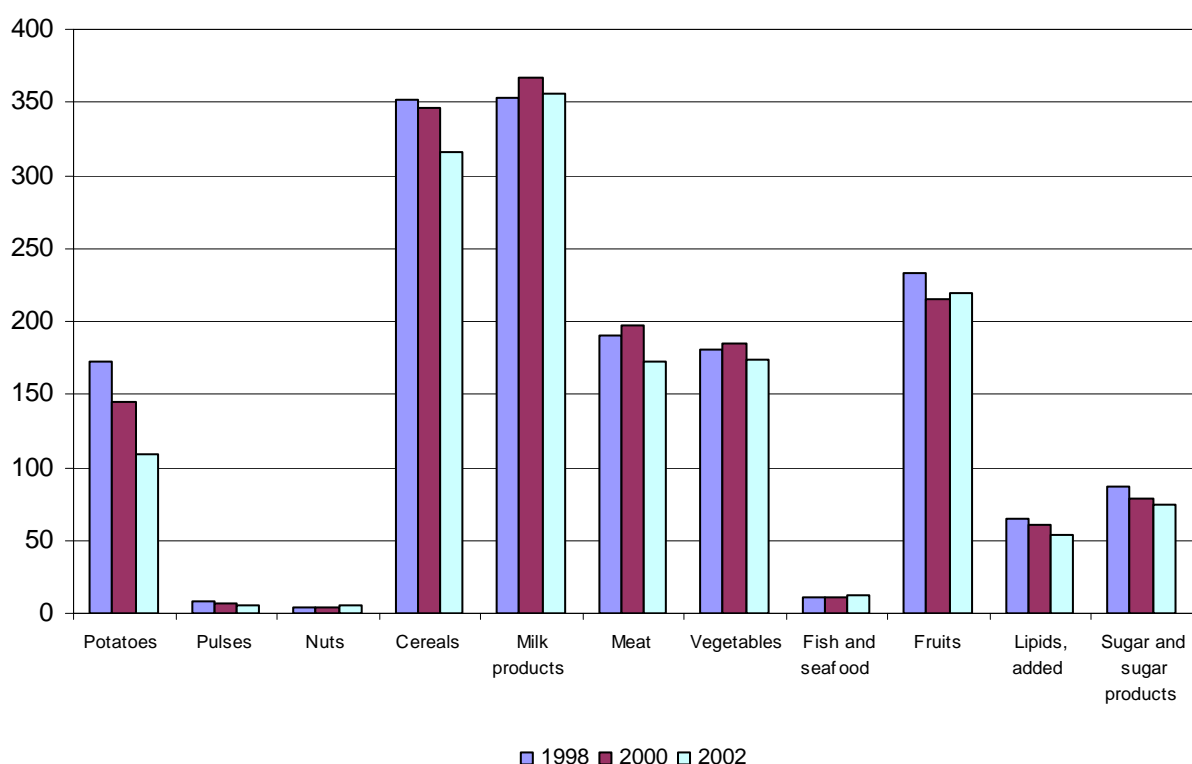


Figure 2: Mean beverage availability in Slovenia, in 1998/2000/2002 (ml/person/day)

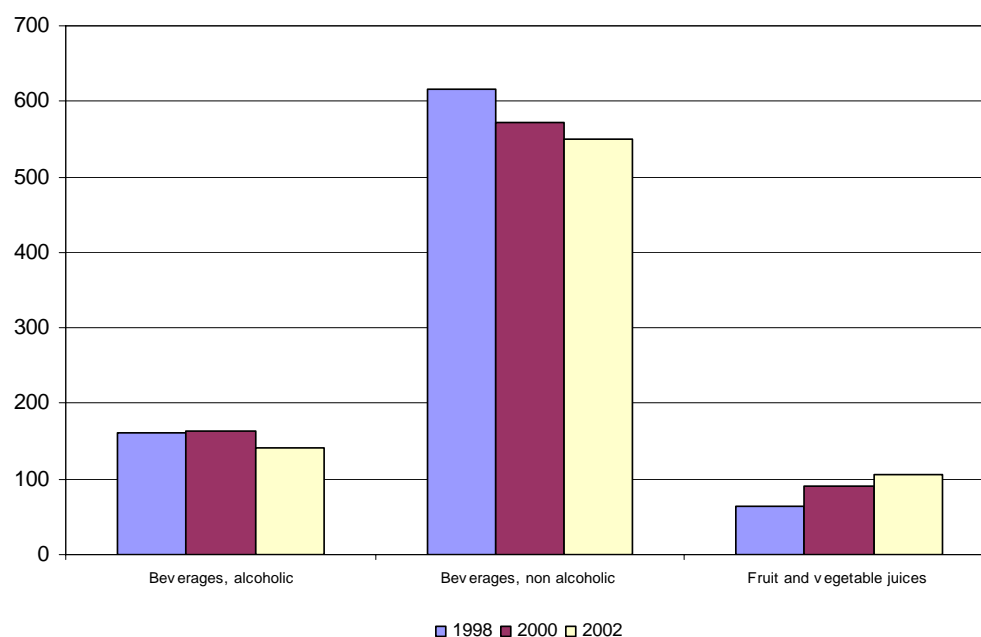


Figure 3: Mean food availability in Slovenia by educational level of the household head in 2002 (g/person/day)

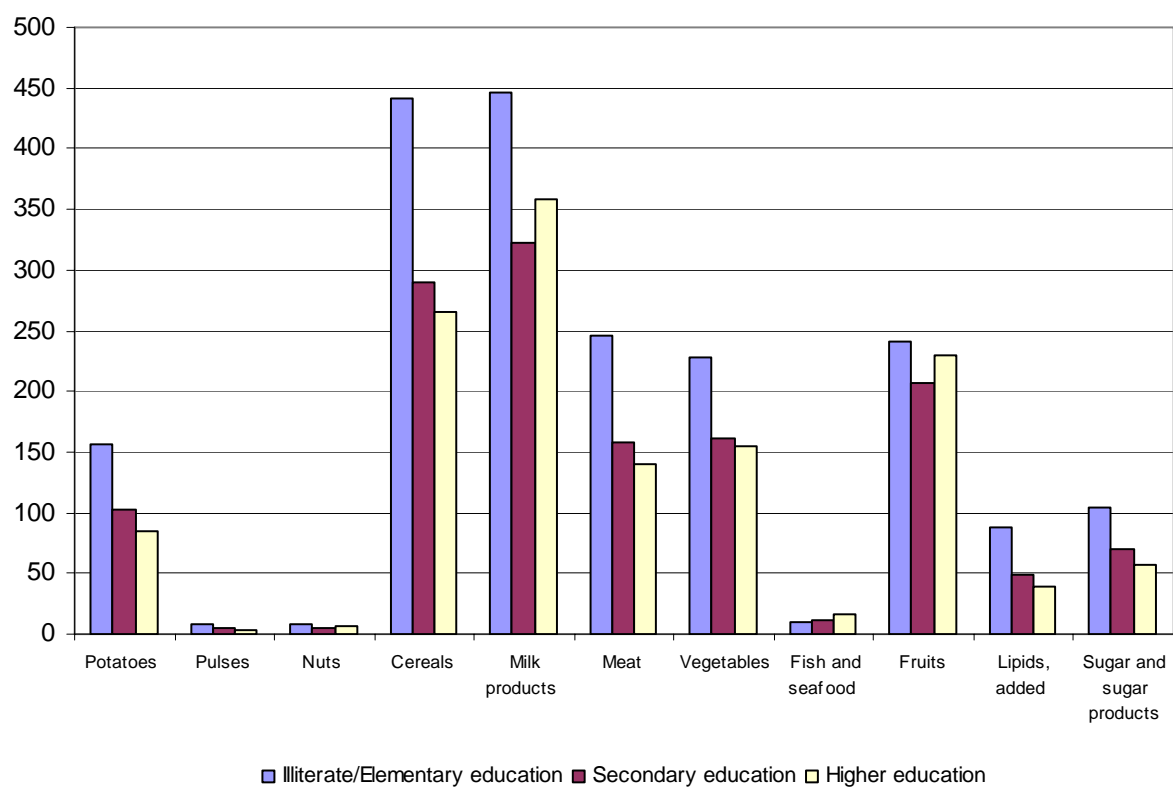


Figure 4: Mean beverage availability in Slovenia by educational level of the household head in 2002 (ml/person/day)

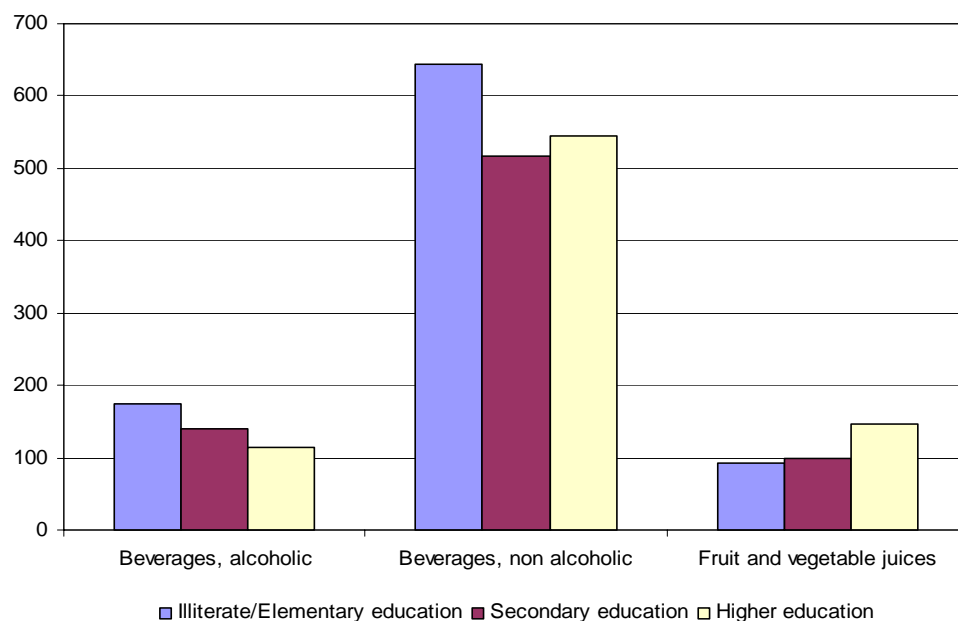


Figure 5: Mean food availability in Slovenia by occupational status of the household head in 2002 (g/person/day)

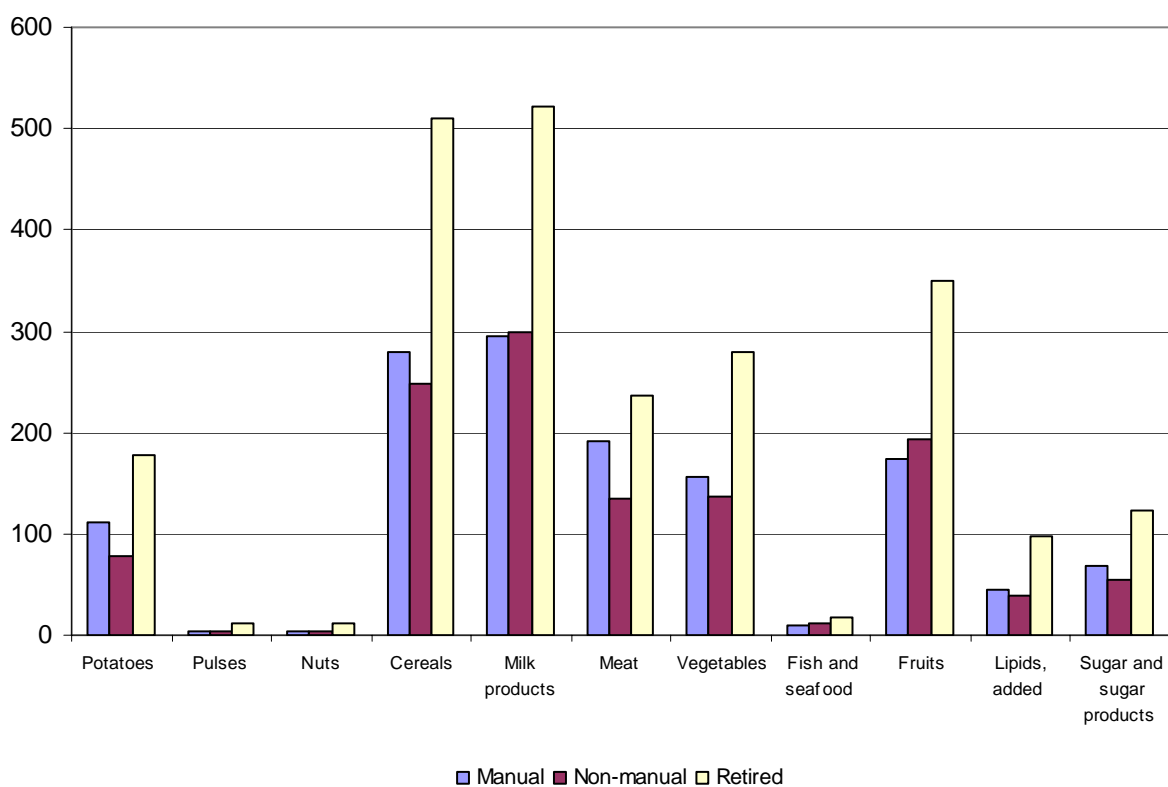


Figure 6: Mean beverage availability in Slovenia by occupational status of the household head in 2002 (ml/person/day)

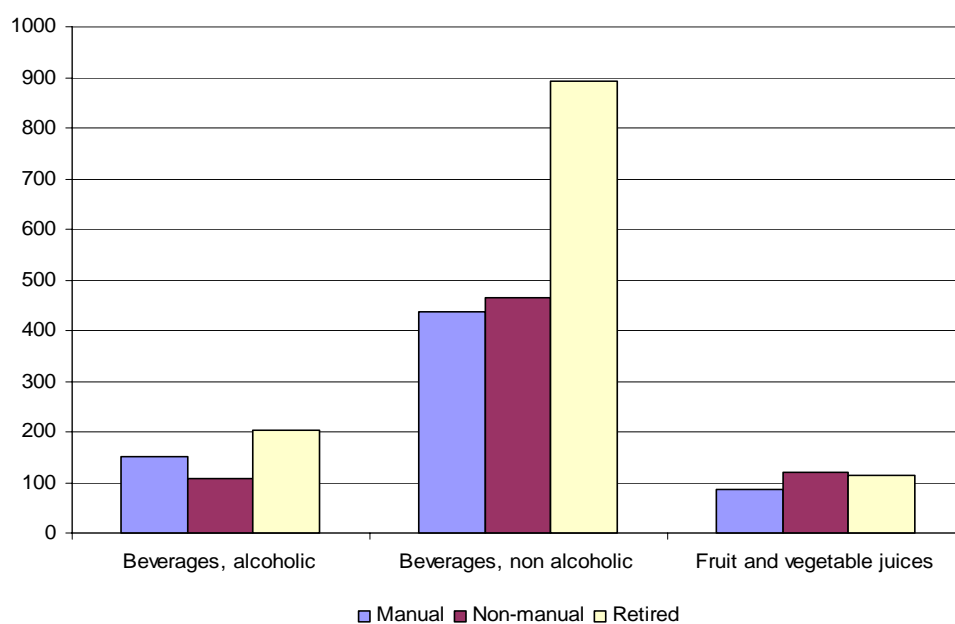


Figure 7: Mean availability of potatoes, cereals and meat in Slovenia by household composition in 2002 (g/person/day)

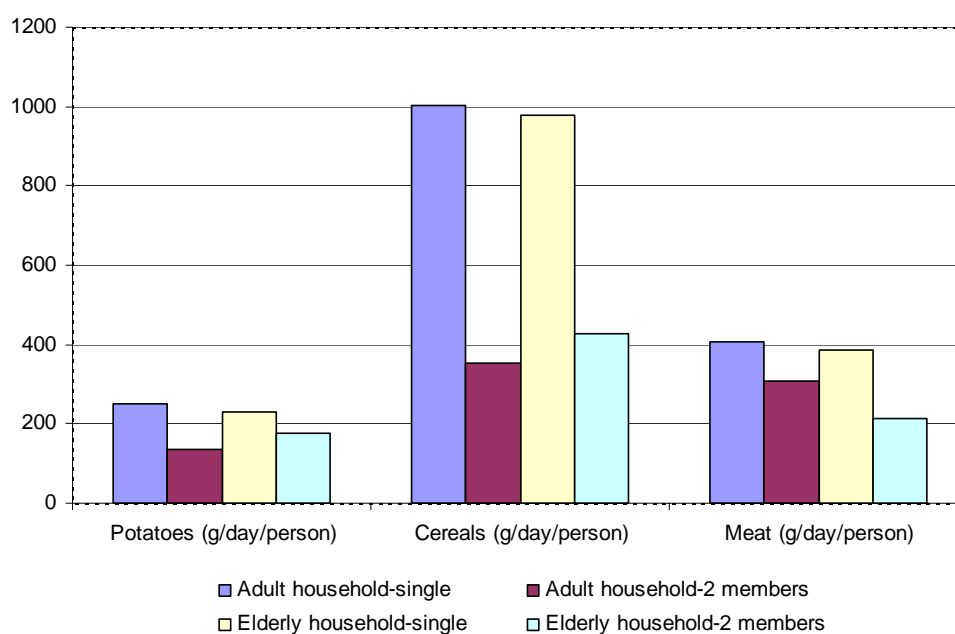


Figure 8: Mean availability of vegetables, fruits and added lipids in Slovenia by household composition in 2002 (g/person/day)

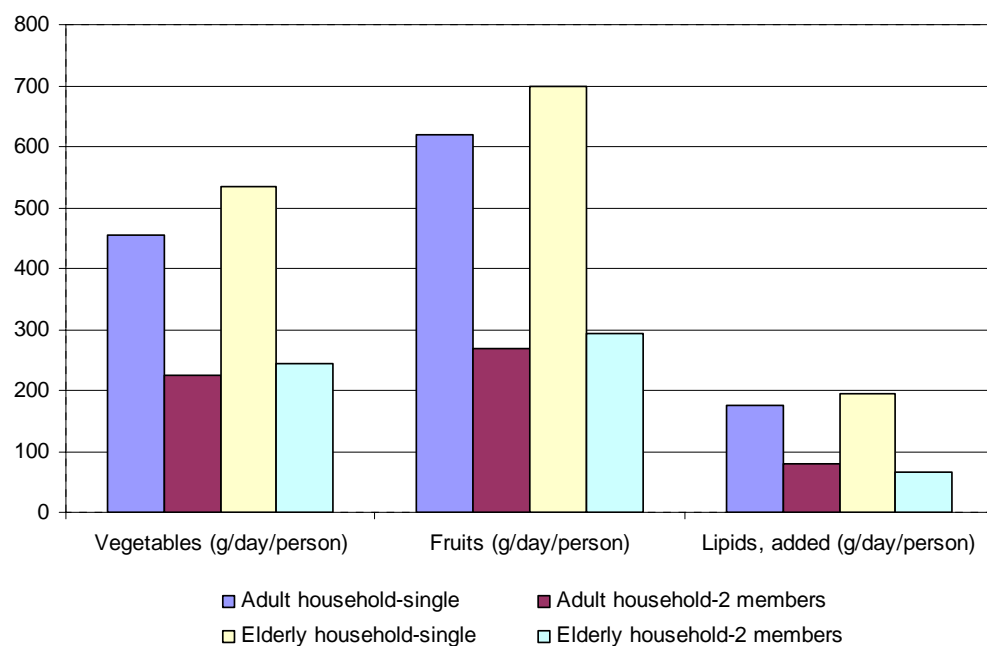
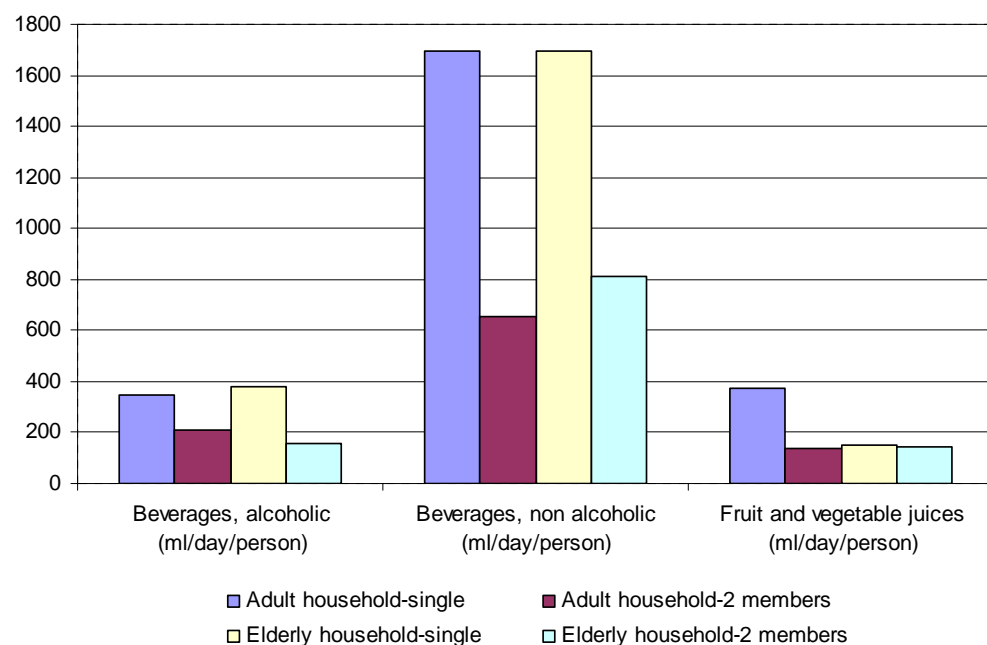


Figure 9: Mean beverage availability in Slovenia by household composition in 2002 (ml/person/day)



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Notification

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